



AN

+ ILLUSTRATED + WEEKLY + MAGAZINE +

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

H. H. STATHAM,

FELLOW OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

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"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private princedom, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

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VOLUME LV.—JULY TO DECEMBER, 1888.

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OFFICE: No. 46, CATHERINE STREET, COVENT GARDEN, LONDON, W.C.





+ ILLUSTRATED + WEEKLY + MAGAZINE +

NO. 100

ARCHITECT ENGINEER ARCHITECTURAL CONSTRUCTOR

SAVARY REMOVED AND ART-TOVER



Wyman & Sons, Printers,  
Great Queen St., London, W.C.

PRINTED BY THE PRESS OF THE LONDON & WESTMINSTER PRESS

THE LONDON & WESTMINSTER PRESS, LTD., PRINTERS, GREAT QUEEN STREET, LONDON, W.C. 2. THE LONDON & WESTMINSTER PRESS, LTD., PRINTERS, GREAT QUEEN STREET, LONDON, W.C. 2. THE LONDON & WESTMINSTER PRESS, LTD., PRINTERS, GREAT QUEEN STREET, LONDON, W.C. 2.

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## Historic Towns: Colchester.\*



NOTHER volume, the fifth, of the "Historic Towns" series, has recently been issued. While the previous volumes have treated of cities or towns that have played a conspicuous part in

its Norman Castle, its brick Priory Church, and its profusion of Roman antiquities, make it a place of the greatest interest for the historian and archaeologist."

The method in these volumes has hitherto been to discuss the history of the town under review more generally than in detail. The meagre history of Colchester has rendered a change necessary, and we have many local items discussed more closely than hitherto. The opening chapters are well illustrated by two good maps, one showing a remarkable series of earthworks to the west of the present town, the other a detailed map on which is marked the sites of the principal discoveries of Roman antiquities. The latter is of no little interest in relation to Colchester topography, and since it appears, apparently, for the first time, it is a special feature in the book. The former shows a curious and somewhat complicated series of earthworks, extending in long, weak lines, without much purpose or design, if we may say so without their key. Here is supposed by our author, following in this respect many others, to have been the ancient British *oppidum*, the City of the king Cunobelin, the stronghold called Cam olu dunum. To us the lines do not appear to assume any regular form such as we should expect to find in the earthworks surrounding a Royal city, such as, for instance, may be traced at Verulamium, where the early earthworks are crowned by the Roman walls of later date. They appear more like some outworks of approach to something else,—such as, for instance, are found on the land side of Chichester, where earthworks extend for many miles. This supposition would lead us to suppose that Camoldunum occupied the site of the present town, but it is fair to say that there is nothing whatever in the regular form of the existing Roman walls to warrant the belief that they stand on the site of any earlier earth works. Still, we have ample

evidence to show that the present town does actually stand on the site of the original Roman settlement, and there is fair reason to suppose that at that time no walls were in existence.

Notwithstanding the good map, the Roman period is rather hastily dismissed in the pages before us, and the very many Roman discoveries are barely referred to, except in the marginal references of the map itself. The discoveries are too rapidly passed over, especially considering that Colchester is indebted to so great a degree to its early history for the interest which its name creates. "Very few articles of any kind remarkable for artistic excellence or costliness have been found." We venture to differ with our author in this respect, for the well-known Colchester sphynx is among the most artistic of Romano British sculptures in existence. The same may be said of the very remarkable sepulchral figure, also carved in stone, which forms the chief feature in Mr. Joslin's interesting museum. This sculpture, by the way, is really too important to remain for long in any private collection. We can well imagine the owner's wish to retain it during his lifetime, but we can conceive no more graceful act than for it to be bequeathed eventually to Mr. Joslin's native town.

In addition, the gladiator cup in the Colchester Museum, and various portions of tessellated pavements, one especially of recent discovery, are of elegant design and workmanship, capable of being compared with the best works that have been found in Britain.

The two first chapters are occupied by a very interesting and readable narrative of the early history of Britain, more especially of that portion of it in which Colchester is situated. Mr. Cutts has put together in small compass a mass of facts relating to the invasion of Caesar, as well as to the more important one in the time of Caligula which resulted in the permanent establishment of the Roman rule. The

\* Historic Towns: Colchester. By the Rev. E. L. Cutts, B.A. London: Longmans, Green, & Co. 1888.



evidences of the old historians and of the British coins are treated very judiciously, and the two chapters will be read with pleasure, although it may be news to many of our readers that a triumphal arch of the Emperor Claudius still exists at Boulogne.

The founding and the laying out of the Roman colony under Claudius, or, more probably, under Publius Ostorius, who arrived and who remained in Britain after the brief visit of the Emperor, is also an interesting chapter. Reference is made to the statement of Tacitus, with respect to the erection of the Temple of Claudius, a theatre, a senate-house, &c., and the chapter concludes with a graphic account of the revolt of the Iceni and other tribes, under Boadicea, when Verulamium, Londinium, and Colonia fell before their furious onslaught and were reduced to ashes. The probability that our town was then undefended by a wall is referred to, and it appears to be more than probable.

Fitting reference is made to the fact that the town can still boast of the existence of its Roman wall, which still exists in so perfect a condition that it can be traced almost entirely along its course. It is 10 ft. thick and is backed up by an earthen bank on its inner side except to the south, the masonry being of rubble and *septaria* or cement stone, with bands of flat Roman tiles. The angles of the wall are rounded, as is the case with several of the early earthen camps in the north of England, and there are some important traces of the original west gate, which for some unexplained cause appears to have ceased in early times to be used as an important entry. The positions of the old Roman cemeteries have been well made out by discoveries from time to time, and some of the finds are of objects of remarkably early date, which go far to show that the existing site of the town is that of the original colony, since the cemeteries have been found all around it. The old legends relating to the birth of the Empress Helena and her connexion with Colchester are examined and found to be worthless. Our author, in treating of St. Helen's Chapel which has existed in the town from time immemorial, might have referred with advantage to the recent graceful act of Mr. Round in restoring the building, and also have made a passing allusion to the interesting fact, hitherto unrecorded, that the foundations are those of a Roman building. This is abundantly proved to be the case from the circumstance that the Roman tiles which occur in regular bands are all unbroken ones, showing clearly enough that they have not been taken from elsewhere.

Following the history of the town in its chronological order, the advent of the Saxons is naturally referred to, and the difficult question, "What was the fate of the town," is discussed. Our author holds to the opinion that, as a rule, the conquered towns, with perhaps one or two exceptions, were taken, sacked, burnt, and left waste and without inhabitants. Still, with respect to Colchester, he admits that it could not have lain waste for long, since, when the Saxons came to colonise it, its Roman name had not been forgotten, as in a score of cases of Saxon towns on Roman sites. Attention might also have been called to the fact, which is not a little remarkable in the direction of its actual existence, that the ground-plan of the Roman town exists to this day, to a large extent, in the modern streets, and this continuance of existence is apparent by the fact that the churches, which are numerous and of early foundation, are all placed parallel to the streets, showing that they were in existence before the churches. The Domesday Survey renders us interesting evidence that at its early period the burgesses had already obtained some sort of municipal rights, and had the regulation of their own internal affairs. The burgesses were, at the period of the survey, 276 in number, and by an ingenious calculation the population is shown to be 2,250.

The building of Colchester Castle is attributed to Eudo Dapifer, and between the Conquest and the end of the reign of Rufus, "for it is mentioned as existing in the confirmation grant of Henry I.," and it stands

on what was the Royal Demesne. Its size, 155 ft. by 113 ft., renders it by far the largest of all the keeps which remain in England. Its erection on land belonging to the king or derived from him is valuable evidence in relation to the position of the castle, which is not far from the centre of the town, a very anomalous position for a Norman castle, placed as this is, having but little if any relation to the lines of fortification of the latter. Our author speaks of the site having been inclosed by earthen mounds. Two of these banks, which are of enormous size, exist in Mr. Round's garden, and although they are thrown up over early Roman foundations, there is something so unusual in their form, in comparison with what is found in relation to other Norman works, that we venture to believe that these banks are of late Roman date, and that they point to the existence of some earlier building on the site of the castle. Allusion is made to the tradition, that Gundulph, of Rochester, was the architect of the castle, and also to the belief that another story once existed above the present fabric.

Our town, like many others, had its full share of monastic establishments, and their rise, progress, and fall at the Reformation are treated in various chapters, as well as the foundation of the Free School, the Charity Schools, and Almshouses after that event. Religious persecution lighted its fires within the walls, and foreign persecution brought within them many an industrious refugee, all of whom were welcomed by the town,—at first at any rate,—and with good reason, for the modern well-being and the revival of the trade of the town can be traced in no small degree to them. The description of the siege of Colchester by Lord Fairfax, and its ever-memorable defence under Lucas and Lisle, in 1648, must be read to be appreciated. The graphic narrative is illustrated by a pretty little reproduction of a contemporary map, which shows the positions of attackers and defenders.

A notice of modern events closes this very interesting volume, and we can but congratulate its author upon having brought together into moderate compass an array of facts and notices of incidents which have far more than local importance. The book, like all the other volumes, deserves to be read carefully by all who are interested in the rise and progress of our country, and its moderate price places it within reach of all. Our notice would not be complete without some special reference to perhaps the most interesting of the items of information in the pages before us. There are two taxations of the town in the time of Edward I. still extant. These records have often been referred to, but in our author's hands their evidences are set before the reader, shortly and clearly. Not only are they of value in recording the names of all the rated inhabitants, but in the references to the property they held, their stocks-in-trade, their furniture, and such like.

And a very sordid idea these documents render of the daily lives of the people in the beginning of the fourteenth century. The furniture was scanty, personal ornaments all but absent, the small quantity of money in circulation is simply astonishing, the poor style of living is but too apparent, and the poverty of the dwellings even of the trading class affords us too plain an insight into the miserable condition of those of the working classes. These documents, which fortunately exist so far as Colchester is concerned, are of the highest importance to all who would study the amount of progress of later years.

#### "THE REVIVAL OF ARCHITECTURE."

BY GEORGE AITCHISON, A.R.A.

UNDER the above title Mr. W. Morris gave us, in a recent number of the *Fortnightly Review*, an entertaining account of his views on things in general, including architecture. From one who is scholar, craftsman, and artist, and who was, it is believed, educated as an architect, we expect some words of wisdom,

and we are not wholly disappointed; we look, too, for prophetic utterances from a poet, and we get a prophesy. Setting aside the author's statements of his predilection for Gothic, and his belief that no other style has any merit, the article is merely a plea for the preservation of ancient buildings, partly because the civilised world has no style of its own, a truism that it can have none, while utility is its only aim, and a prophesy that there will be a new style throughout the world when the aim of trade is different and the working classes are in a different position. The re-assertion of Aristotle's dictum that architecture is one of the master arts, is hardly likely to be disputed by any one who understands what architecture is, but that the ornamental arts are dependent on it is a very different proposition; in fact, the reverse might be easier maintained, for, if the utensils and adjuncts to civilised life be shapeless and ugly, we can hardly expect such comparatively great and complex things as buildings to be beautiful.

The romantic school of literature, allied as it was to archæology, had no doubt some effect on the revival of Gothic. Sir Walter Scott's heroes and heroines, though true types of the eighteenth century, masqueraded in Gothic clothes and in Gothic buildings. It was, perhaps, natural for the readers of his novels to jump to the conclusion that some of their virtues were imparted to them by the Gothic clothes they wore, and the Gothic buildings they inhabited; new buildings were accordingly designed after the Gothic fashion, in the hopes that they might impart some of the old picturesqueness and romantic virtues to their inhabitants, just as the supposed innocence and virtue of the shepherds and shepherdesses caused the courtiers of Louis XVI. to masquerade in the dresses of the stage shepherds and shepherdesses, and to address one another in that bucolical style that Swift ridiculed. The Anglo-Catholic movement was a similar compound; it was taken for granted that the power of the priesthood in Gothic times was partly due to the peculiar form of the buildings they officiated in, to the utensils they used, and to the vestments they wore, and the supposed piety of those ages was attributed to the same source; besides, in this latter movement, an investigation of the principles of Gothic gave a new occupation to many clergymen, professors, and antiquaries. As the Romantic school in letters was opposed to the Classic, so was the picturesque in the visual arts. Besides the natural avidity for change (the Classic ideal having lasted for nearly three centuries), it cannot be doubted that perfection of proportion and form, which is the animating principle of Classic, was not so acutely felt as in the earlier days of the Renaissance, and the almost stereotyped arrangement of façades became dull, not to speak of the continuance of an apparent method of construction that had long been superseded. There seemed, too, more chance of pruning semi-barbaric luxuriance, and of giving grace to semi-barbaric vigour, than of giving vitality again to the dregs of the current style, and that, too, in an age when there was not even the semblance of a desire for visual beauty, even if there were not a Puritanical revulsion against it,—when, in fact, the ordinary house which Mr. Morris aptly defines as "a brick box with a slate lid," was considered as "a good sensible house." In 1812 the Smiths put the prevailing sentiment into Cobbett's mouth, on the rebuilding of Drury Lane Theatre:—"You are now got into a large, comfortable house. Not into a *gimcrack palace*; not into a *Solomon's Temple*; not into a frost-work of Broddingnag filigree; but into a plain, honest, homely, industrious, wholesome, *brown brick playhouse*." A sentiment, I fear, that is even now reiterated in the heart of hearts of many who are considered the patrons of art. This truly was the fallow of architectural art,—a fallow that probably never existed before, for there was a deliberate desire to exclude beauty, while even at the over-running of the Roman Empire the savages would probably have had something ornamental, if they could have compassed it. Successful nations, civilised in all but the



visual fine arts, will not wait for the re-development of art, when they want magnificent buildings, and can see the remains of old ones at home or abroad. Greek temples and entrances were imitated without a question of their fitness for other uses and for another clime. Gothic was here, and was at first imitated, with as little regard to its appropriateness, and as its principles were lost it was a new field of study for an analytical age, and offered as well a new quarry for use. Mr. Morris, like his masters, Pugin and Mr. Ruskin, can see no goodness, no beauty, and no fitness in any style but Gothic. The merits of Gothic are many, you may call it picturesque, quaint, original, wonderful, daring, mysterious, vigorous, sometimes even sublime; but if beauty means perfect proportion, with perfect grace of form, to call it beautiful is to use language in the same loose way as people who call a tender leg of mutton beautiful. It was mainly from its lack of this quality that it perished at the touch of the Renaissance, revealing itself like Satan at the touch of Ithuriel's spear.

Mr. Morris does scant justice to the wonderful feat mainly performed by English architects within about half a century, of being able to use Gothic as it was used in Gothic times, so that had a Gothic architect come to life, he might think he was in his own age again. Considering that Michelet thought Gothic could only have been executed by celibate priests, fired by enthusiasm, this feat may well excite our wonder and admiration.

It is surprising that, amongst the number of the praised, W. Burges is not included, the most original and vigorous of the band of Neo-Goths. Mr. Morris seems surprised that the Neo-Goths, having carried the style as far as it ever went, could not carry it farther, forgetting that it had worked itself out and died a natural death, that its construction was not ours, nor did its semi-barbarous æsthetic qualities appeal to what little taste was left in the nineteenth century. If the people of the fifteenth century were sick of "grisly saints and martyrs hairy," these were hardly likely to captivate the taste of the nineteenth. The semi-Classical revival in the shape of the Dutch Renaissance, comically called the "Queen Anne Style," made at least a step towards the re-habilitation of the familiar Classic forms, and brought us back to the course of history, Gothic having extruded itself like a vein of porphyry amongst limestone rocks.

We are still in the full fallow of architecture, the only difference being that the architects are better taught and more highly skilled than they have been for nearly two centuries,—if we exclude a few exceptional men,—and they have an infinitely greater acquaintance with the architecture of all present and all past work; but architects, from the nature of things, by no means afford enough leaven to leaven the lump, even if the different sorts of leaven they supply did not naturally destroy each other: no fine art can flourish unless it can meet with accurate and intense appreciation. Can any one assert that the exquisite proportions or form of any architecture done in our lifetime has given a thrill of rapture to a hundred people, and can we wonder that men of genius will not wear their lives out, in striving for ideal perfection, when the whole people are as callous as the nether millstone?

Do eloquence and rhetoric flourish under a despotism? Must there not be a free people to be persuaded and enchanted?

The great epochs of poetry have occurred, when the nation of the poet has been stirred to the inmost recesses of its soul by conflicting emotions, when hope and fear, joy and desperation, exultation and despair, have played on every chord of the heart; and when success has crowned the nation's hopes, the poets born in the days of desperate anxieties have poured forth their song of exultation and praise. Consider the times of Chaucer, Shakspeare, Milton, Dryden, Pope, Burns, Byron, Shelley, and Keats: high poetry is not to be got in grovelling ages.

Architecture only flourishes in architectural epochs. The question is whether we can

accelerate or retard such an epoch. There is one thing we certainly can do, we can fit ourselves to make the most of the epoch when it does come.

The cause of fine art epochs has, as far as I know, never been investigated; certain causes must, however, concur. There must be sufficient ease and leisure for the cultivation of taste, comparative peace and accumulated wealth, and an active desire to adorn the country with magnificent monuments. The ease and leisure, the peace and accumulated wealth may concur, but there may not be the desire to cultivate taste or to adorn the country. If there exists vigour and energy amongst the people, it is obvious, if there is no taste, that energy must be expended in other directions. The moral and intellectual fibre of the people of each age must perforce modify the views of the next, for we are insensibly warped by our education; accidental circumstances may often impel large bodies of the population to turn in one direction rather than another; "the accursed love of gold" has and will attract mankind to the readiest means of getting it; different paths have led at different times to the highest reputation, which is more valued than gold; the comparative safety of the pursuit is, too, another element in its popularity.

During the Gothic period, under the dead hand of the church, you could only think safely on architecture, the visual fine arts, and music, if you wanted to escape imprisonment, torture, or the stake. At the Renaissance the entire range of human knowledge showed its vista to mankind. And after the Reformation, science, or the investigation of the laws of nature, seemed to have most fascination for mankind, and when the discovered laws began to be applied to human needs, wealth was created beyond the dreams of the alchemist. Men's thoughts have been turned exclusively to the intellectual side of existence, and in the mad race for knowledge, power, and pelf, beauty has been overlooked and trampled under foot, as a thing too slight for the attention of a human being. Aristotle's profound remark that the end of life is to learn how to employ one's leisure nobly, has hitherto been overlooked, and only one of his four sections of education has been considered worthy of the attention of the State, *i.e.*, reading and writing. Gymnastic, music, and the graphic arts have been wholly overlooked.

Wealth has had a development unprecedented in the world, and the bulk of people in England have unprecedented leisure; there is, however, only one marked development of taste, *i.e.*, that for colour. The means of learning the art of drawing and modelling, and of cultivating taste is now provided for the wealthier classes at the universities, and though drawing is not compulsory, as it will be, at the Board schools, the Government cheap drawing and modelling schools are open in every town.

Picture galleries of old, modern and contemporary pictures and sculptures, exist in most of the large towns, so that if the taste for beauty does not develop in the next generation, it must be owing to causes beyond man's control.

It is not surprising that there is nothing in the heavens above, the earth beneath, or the waters under the earth, for which mankind care; that they are indifferent whether their buildings soar in the air or grovel on the ground, whether they are beautifully proportioned and composed or whether they are the mere huddling together of incongruous and discordant parts. At present the only question that interests mankind is, whether they can be built quickly and are cheap. For the last century, the question has been how to solve the problems before us at all, not whether the things made are fair to look on. To produce beauty has not been asked for, but how to perfect the steam-engine, and, when this was done, how to apply it to produce the necessities and comforts of life; how to move rapidly from one place to another; and this involved the bridging of rivers and arms of the sea, the levelling of valleys, and the boring of hills; how to communicate instantaneously with the uttermost

parts of the earth; how to produce artificial light on a grand scale; how to use electricity, not to speak of how to use new materials, and to use up waste products. And so intent have we been on our problems, so eager have we been to get rich, that we have overlooked beauty, and so surrounded have we been with every form of ugliness, that we have grown callous. It cannot be said that architects have been behindhand; thousands of small houses, shops, and villas throughout England show the greatest care and skill in their arrangement for health and comfort, so as to earn the praise of cultivated foreigners. There are attempts to clothe them with shapeliness, to enrich them according to the architect's taste; but no style can arise until there is not only a general development of taste, but a consensus of it in some definite direction.

Until works of an enduring and monumental character are common enough to cause strenuous efforts for their proper constructive and æsthetic solution, we can never hope to rival the vaulted structures of Rome, of Byzantium, or the Middle Ages. Iron, which forms the groundwork of most of our larger constructions, has as yet received but little attention on its æsthetic side owing to the want of taste and parsimony of the public.

My own impression is that the form modern architecture will take is that of elegant simplicity, where the exquisiteness of the curves and proportions will represent the skill and experience of half a lifetime, and adorned, too, with noble sculpture and harmonious colour. Our civilisation seems far removed from the semi-barbaric vigour of the Middle Ages, and its mechanical repetition of unlovely form.

A profession like architecture, that requires such opposite capacities in its votaries, that involves such vast knowledge and such infinite labour, must meet with adequate reward in wealth, honour, and reputation if it is to flourish. Ought we not rather to be surprised that it is so excellent, when its money rewards are contemptible, and its only other rewards are ingratitude and obloquy.

#### NOTES.

**T**HREE Government Bills were introduced in the House of Commons on Monday for the improvement of the rivers Bann, Barrow, and Shannon, by the Chief Secretary for Ireland. These rivers were reported upon some time ago by the Royal Commission on Irish Public Works, and their recommendations have been adopted by the Government. The mode of payment, however, proposed by the Commission, is not followed. It had been proposed to provide funds by loan and free grant for the execution of the works only, leaving their maintenance to be otherwise provided for, but Mr. Balfour prefers to reduce the amount to be expended in capital sum and to provide means of maintaining the works. The engineer who laid down the plans has been requested by the Government to superintend their execution, and he has consented. The Treasury will supply the money, partly by way of loan secured on annual payments by the occupiers of the whole of the lands in each river basin, and partly by free grants. The object is to lower the water-level of those rivers in times of flood, so as to afford at all times a free outlet for the land drainage; and it is the first time that the important,—and we may say the true,—principle of rating the whole of the lands in a river basin has been put into practicable form, the lower lands, which are practically benefited by relief from floods being rated higher than the uplands, which receive no practical benefit, but which, nevertheless, are implicated, inasmuch as they contribute by their free drainage to swell the amount of injury to the lands below. It is estimated that a penny in the pound on the rateable value of the uplands will be their fair proportion. When we have examined the Bills, not yet issued, it may be worth while to return to the subject more at length. On the second reading of these Bills, some highly-important principles of arterial drainage will probably be



debated, and so brought under general attention more closely than they have hitherto been.

THE Grand Committee on Trade have not yet disposed of the Railway and Canal Traffic Bill, the 25th clause (that relating to undue preference) being productive of several amendments and discussions. Mr. Bolton proposed that only "competing traders or classes of traders" should have the right to complain that different charges for similar merchandise or similar services were made. This was negatived, and Sir R. Paget carried an amendment making the clause clearly applicable where any undue difference of treatment was made,—not merely difference in rates. It will be remembered that subsection 2 provided that, in deciding whether such difference did or did not amount to undue preference, the Court might consider whether such lower charge was necessary for the purpose of securing, in the interests of the public, the traffic in respect of which it was made. A large proportion of the Committee were of opinion that this would undo the provision already agreed to that there should be no difference in treatment between home and foreign traffic. Sir Michael Hicks Beach did not think the second sub-section in any way qualified the first, and on his promising to bring forward a proposal at the next meeting making this clear, the motion to omit it was negatived by 39 to 15. In fulfilment of this promise, the following words were submitted to the Committee at last Monday's sitting, and unanimously agreed to:—"No railway company shall make, nor shall the Court sanction, any difference in the rates or charge made for, or any difference in the treatment of, home and foreign merchandise in respect of the same or similar services." It was also agreed at this sitting to give the Committee power to take into consideration whether the inequality complained of could not be removed without unduly reducing the rate charged to the complainant. This apparently means that inequalities will be adjusted by low rates being advanced instead of high ones being reduced. By a majority of one vote only the Committee decided that the Commissioners shall be bound to hold that the charging of a lower rate per mile for a longer than for a shorter distance constitutes undue preference. It appears to us, looking at these two decisions, that such industries as the fish trade will be prevented from deriving much benefit from this clause; for the effect will probably be to send up long-distance charges where any competitor situated somewhere *en route* claims proportional rates. The awkward "equal mileage" question is bound to obtrude itself here, and unfortunately seems not unlikely to lead to unworkable provisions being inserted in the Bill.

THE discussion in Committee of the maintenance of roads clause of the Local Government Bill, on the 28th ult., was in great measure the discussion of a string of abortive amendments, of which one after another was "by leave withdrawn." This list included an amendment by Sir J. Dorrington that the Councils should not take over the maintenance of roads till April 1, 1890, apparently from an idea that they could not be prepared to do so; but it was pointed out that they would have power under the terms of another amendment (which the Government were willing to accept) to delegate the repairs to District Councils for a convenient period. Sir W. Bartlett subsequently moved an amendment of a remarkably illogical character, to leave with the County Council the responsibility for repairing the main roads, but relieving them from any duty of keeping up the footpaths, and further, to provide that the County Council should not be responsible for any repair otherwise than "what was necessary for retaining the same in a condition for the conveyance of the through traffic": a curious example of the utterly unbusinesslike notions of some of our legislators. By what possible process did Sir W. Bartlett imagine that it was to be settled exactly how much repair was necessary for through traffic, and at what point the repair became such as to

have special reference to Borough or local traffic? Of course, this proposal was negatived. A better fate attended another still more elaborate amendment proposed by the same member, the main object of which was to empower the County Council to require a District Council to contract for the maintenance of its roads on consideration of annual payments made to them by the County Council for that purpose, such payments not to be made until the Surveyor of the County Council had certified that the work was efficiently done. The object of this amendment was to place the maintenance in the hands of the local authority, which would best know what was required from time to time on the roads, but to keep the eye of the county authority over the work. This was agreed to. Mr. McLaren introduced also a sensible amendment to empower the urban authority to claim for the maintenance, "improvement, and enlargement," of a road, citing a case in which an urban authority had had to pay out of its own pocket for wood paving on the ground that this was not "maintenance." Eventually the amendment was carried in an improved form suggested by Mr. Stansfeld, who substituted "reasonable improvement" for "improvement and enlargement"; the latter phrase might certainly open a rather wide door to an urban authority. The adoption of this amendment is also satisfactory, for it would be against the public interest, and very hard on an urban authority of enlightened views, that the adoption of an improved form of paving, which would save a great deal in annual expenditure, should become the occasion of what would practically be a fine on those who had initiated the improvement. Another amendment that was carried was proposed by Mr. Brunner, to settle the amount of contribution by a County Council to an urban authority by direct reference to the Local Government Board, instead of by arbitration. This was carried, and appears to be an arrangement calculated to promote economy both of time and money, as well as simplicity of working, inasmuch as the Local Board is already the final authority in case of non-agreement in the appointment of an arbitrator.

AT the same sitting of the Committee to which reference is made above, the question of clause 16 of the Local Government Bill, referring to the pollution of rivers, came up. The clause, as standing, empowers each County Council to enforce the provisions of the Rivers Pollution Prevention Act for that portion of a river within its own county. Mr. Brunner proposed an amendment to place the whole control of the river under a joint committee appointed from all the County Councils through whose counties the river flows. He said:—

"The protection of a river from pollution required a very high degree of scientific knowledge, which might be more easily secured by a large and important body than by a small local one. When once people began to consider the river as an entity from its source to its outlet, they would take greater care in seeing that the stream was not polluted, and that floods were prevented. By putting this power into the hands of the reasonable body of men who would be appointed to sit on those local bodies, the rivers would be cared for in every particular, and the country as a whole would reap an enormous benefit."

We seem to be going on a continually ascending scale in search of some authority which will honestly and effectually administer against the pollution of the rivers. The Rivers Pollution Prevention Act has failed because in so many cases those whose duty it was to enforce penalties were themselves the offenders. The County Council is proposed as a superior body which would be above the temptations of smaller local bodies. Mr. Brunner thinks even County Councils could not be trusted to act separately in this matter, but that if all linked together, they will exercise a mutual check on each other. "Nothing of the sort," says Mr. Bradlaugh, in continuing the discussion; "it would make matters worse; power ought to be taken from the local authorities, and put in the hands of the Local Government Board, so that penalties

might be enforced against those people who would not enforce them against themselves." The Attorney-General suggested that in the case of local pollutions the County Council ought to have the power of dealing with them without waiting for the support of a committee of all the counties. But the fact is, as Mr. Brunner rightly said, that pollution of a river can hardly be said in any case to be really or wholly "local"; it may affect all the lower portions of the river running through the other districts or counties. Ultimately, the clause was allowed to stand over for the present, with an implied undertaking on the part of Mr. Ritchie that it should be strengthened in the Report stage, though he believed the County Council would be a sufficiently large and important body to override local interests. It ought to be so, no doubt; but it seems to be one of the most difficult things in the world to get any authority to deal fairly and efficiently in regard to river pollution; and moreover we are disposed to support Mr. Brunner's view that a river should be treated as a whole in regard to this question, and not in "sections." It is all very well to divide high roads into sections and make each district responsible for its own section; but in the case of the pollution of a river, which is a mass of moving water, it is often the district below the point of pollution which suffers much more than that in which the pollution takes place, and we are decidedly of Mr. Brunner's view that a river should be legislated for as a whole, and not in parts.

A BILL has been introduced into the House of Commons, prepared and brought in by Mr. Whitmore, Mr. A. de Tatton Egerton, Sir Algernon Borthwick, Mr. Lawson, and Mr. Forrest Fulton, to restrict the height of buildings in the metropolis. The object of the Bill is to give to the Home Secretary, pending the election of the London County Council, and then to that Council, powers to restrict the excessive height of buildings in existing streets in London. Under the Metropolitan Management Amendment Act, 1862 (25 & 26 Vict., cap. 102), sec. 85, the Metropolitan Board of Works has such powers in the case of new structures; but in the case of existing structures, neither the Board nor any Government Department has any power to restrict the height of buildings. By the Bill no building, except a church or chapel, shall be erected in any street, thoroughfare, or place of less width than 60 ft., which shall exceed in height the width of the said street, &c., without the consent, in writing, of the Secretary of State before the election of the London County Council, and, after its election, of such County Council, nor shall the height of any building so erected be increased in height. The District Surveyor or other officer of the Metropolitan Board or the County Council is to inform the Secretary of State of any infraction of this Act. The Bill is down for second reading on Monday next, the 9th instant. It is of considerable importance to builders and landowners, and is likely to meet with opposition. It would appear that the Bill has been framed to meet the case of the large mansion at Albert Gate on land belonging to Lord Rosebery, now in course of erection, and the proposed extension of Queen Anne's Mansions, York-street, Westminster.

THERE is to be a "Final Conference on Technical Education," to be held at Finsbury Technical College, at eight, on Wednesday evening next, under the presidency of Sir Albert Rollit. This is the last of a series of conferences in which technical education has been discussed in reference to training for special trades. In this closing conference a more general discussion of the subject is invited, especially in regard to the proposals for technical education now before Parliament.

THE *Scottish Art Review*, a monthly journal published in Glasgow, and of which the first two numbers (June and July) are before us, is a periodical of very high tone, and includes in the first two numbers some very good art-criticism, especially a short article on



the sculpture at the Glasgow Exhibition running through the two numbers. The writer, who signs "Doryphorus," knows thoroughly what he is about in speaking of sculpture and its objects and conditions. The *Review* deals with music and poetry as well as "art" in the ordinary sense, in articles which we have read with pleasure, though we restrict ourselves from dealing with those subjects here. In the July number Mr. John Honeyman contributes a thoughtful article on the "Exhibiting of Architectural Drawings." The only portion of the *Scottish Art Review* we dislike the tone of is the criticism on painting, which is onesided and captious, and holds up the standard of the eccentricities of the new school, which, to our thinking, are going far to kill painting altogether; and the characterisation of the exhibition of the "New English Art Club" as one in which "the common-place, self-satisfied productions which bulk so largely elsewhere are conspicuous by their absence," is almost amusing. We should have said there was hardly any exhibition open in London where there was more "self-satisfaction" with less excuse for it. The painting criticism of the *Review* is hardly, to use Matthew Arnold's phrase, "at the centre of the subject"; it is "eliqué" criticism. But in general we admire the tone of the *Review*, which we see in its next number to take a more important shape, and come out as an illustrated journal.

SOME years ago we gave a tolerably detailed description of Lord Londesborough's collection of arms and armour, when it was on loan at a large exhibition. It is to be regretted that this remarkable collection is now in process of dispersion at Christie's, where it has attracted a great deal of interest while on view. A great many of the swords and guns are of great beauty and interest in an artistic point of view; and in the swords it may be observed that artistic design goes hand in hand with convenience and suitability for work; while in the old gun-stocks the practical fitness and convenience seem in inverse ratio to the artistic beauty of the decoration. The Spanish rapier numbered 31, with what is described as a "swept hilt," i. e., a guard formed by long sweeping curves of metal, is a noble piece of work. Among other interesting swords we noticed No. 29, dated 1517, with a shell guard and an ivory handle, the blade inscribed with the words, "castas; paupert; obediencia;" and a "main-gauche," or dagger, for the left hand in sword duels, the use of which is illustrated in Mr. Pettie's brilliant picture of "a sword and dagger fight." The "Dag" (No. 60), inlaid with figures, birds, and animals, in ivory and pearl, is a remarkable work, and illustrates, with its three barrels and three locks, an early idea of the revolver, only that it is moved round in the hand instead of turning on a mechanical centre. A German wheel-lock gun (77), nobly inlaid with ivory, is a splendid piece of sixteenth-century work. One of the most remarkable lots was the suit of armour, No. 145 in the catalogue, beautifully and delicately engraved everywhere, and formerly further set off by gilding, of which only the traces remain. Life was certainly more picturesque in the days when people wore such panoplies.

THE collection of objects lately brought home by Mr. Flinders Petrie from Egypt, and which are on view in a room in the Egyptian Hall, contains one feature of novel interest, in the shape of the portrait heads which were painted for insertion into the upper portions of the mummy-cases of late date, in the place occupied by the conventional modelled head in the more ancient and orthodox mummy-cases. A number of these, in remarkably good preservation, are placed round the room, and one or two are seen in their places on the mummy-cases. These, however, of course, cannot be regarded as Egyptian work; they belong to the late Roman empire period, perhaps 200 A.D., or thereabouts, and are essentially Roman work. Among the various heterogeneous articles we noticed some wooden cramps "from the masonry of crocodile tombs,"

some four or five centuries B.C., according to Mr. Petrie's idea. These are pieces of wood, about 14 in. long, thicker at the ends than in the middle, performing the part of a dovetail. The wood seems in very good condition still.

LORD HARDWICKE'S gallery of old masters was sold at Christie's on Saturday last. One was a large painting by Samuel Scott of the Tower as seen from the Thames (1753), where will be the middle of the new Tower bridge. Bought for 441*l.* (Scott). Scott's copy of the White Tower, as rehabilitated by Wren, is noteworthy, inasmuch as he has drawn its most striking feature in a wrong position and scale. He places St. John the Evangelist's chapel, with its two crypts, against the northern, instead of the southern, end of the eastern wall of the keep. Nor does he show all of the windows and loops correctly as to size and situation. As seen in his picture the diminished apse, which is really 42 ft. in outside diameter, does further duty as the base of the circular north-eastern turret, formerly Flamstead's observatory. That turret, being about one-third engaged, has a diameter of 22 ft., rises from the ground to the roof, and projects 3 ft. more from the northern than from the eastern wall. A royal standard flies from the pole on the roof, which would not be the case now unless the sovereign were within the walls. All the southern side of the Inner Ward is clearly depicted,—the Bell Tower; Wakefield, or Hall, Tower; the adjoining Treasury House, whereof we gave an illustration on 7th August, 1886, just before its final destruction; and the recently restored Lanthorn (*olim* New) Tower; and, on the Outer Ward, St. Thomas' Tower (Traitors' Gate), with the riverside promenade, or wharf, to which the public were admitted until the outbreak of our war with Russia in 1854. Here, too, are seen some of the Ordnance store-houses and offices, of brick or wood, which from time to time were erected about the Inner Ward. Of these the greater part have within the past five years been cleared away. In the foreground is anchored one of the characteristic Dutch eel-ships, its high round bows and quarter well browned and varnished, now rarer visitors to Billingsgate than of old, but which may still be seen in their pristine form and colour at Hole Haven, by Canvey Island. This vessel has two masts, being of what is technically known as the "Dogger-man" rig. In the distance are Wren's St. Paul's, Monument, and beautiful towers of St. Magnus and St. Dunstan, and London Bridge with its houses and pointed arches. Canaletto's large picture of Covent Garden, looking west down King-street, circa 1750, shows the open market-place, with its booths and coffee-houses, one of them Mrs. Butler's notorious "Finish," along the southern side, and another, King's night-house,—wrongly placed by St. Paul's portico by Hogarth,—Tavistock-row (pulled down 1885-6); Inigo Jones's Church of St. Paul, with its platform and steps (since levelled) and two flanking gateways, and his Great, or northern, Piazza. Lord Orford's house (until lately Evans's, or Paddy Green's, and now the New Club), built in 1716, for Edward Russell, victor at Cape La Hogue, has its original top floor, and the Piazza its third (attic) floor with dormer windows and tile roofing, modified into its modern shape about 65 years ago. From the Piazza hangs the sign "Haddock's Bagnio. Sweating, Cupping, and Bathing at 2/6," and next door, westwards, is Noble's French Wine House, from Bow-street. Beneath the arches stand sedan chairs. A few Hogarthian episodes are introduced amongst the porters and saleswomen. The pillar, erected in 1668, is capped with the cubical stone that had sun dials on three of its faces, with the gilded sphere at top. It is shown as situated a little south of the central walk, where it remained until 1790. At the south-eastern corner of King-street stands the Swan, which is marked by the sign of a jug on a post in Hogarth's (reversed) print of "Morning," published March 25, 1738. With this fine picture by Canaletto, who died 1768, should be compared J. Maurer's view of 1751, bought for 210*l.* (Agnew). The little painting of the Court of Chancery,

Westminster Hall, in Lord Macclesfield's time, with portraits of the Lord Chancellor, Serjeant Pengelly, and Sir Philip Yorke, is mainly remarkable as a study of coifs, wigs, and robes. The public stand in two side galleries, and attorneys with their dogs in the foreground. The tipstaff carries his emblem of office; the mace and bag are conspicuously displayed. Lord Parker was made Lord Chancellor on May 13, 1718, elevated Earl of Macclesfield November 5th, 1721, and impeached in June, 1725. Sir Philip Yorke, Solicitor-General 1720-4, and Attorney-General 1724-33, was elevated to the bench and peerage as Lord Chief Justice and Baron Hardwicke in 1733. Mr. Agnew bought this picture for 115*l.* 10*s.*; Peter Neefs's interior of Antwerp Cathedral, with devotees, beggars, and dogs, by Franks, was sold for 63*l.* to Mr. Colnaghi.

THE town of Guildford, one of the three or four most picturesque towns in England, was *en fête* on the 28th ult. to celebrate the opening of the Castle grounds, which have been laid out as a pleasure garden. The old keep and the few other remains of the old Castle have been carefully preserved, and too much praise cannot be given to Mr. H. Peak, the Borough Surveyor, for his judicious treatment of the old structure. He has resisted the temptation to tamper with the dilapidations, and such repairs as have been actually obligatory have been done in such a way as to clearly tell their tale. Thus an iron newel staircase has been fitted into the old turret in place of the destroyed stone steps, and this is arranged to stand clear of the walls, so as not to interfere with them. The old bowling-green is connected with the Castle proper, and a band-stand erected. One can only hope that the Town Council will find their action so successful as to inspire them to go further and acquire the meadow beyond and the interesting portion of the Castle walls bounding it. More space, which should be valuable, will thus be acquired, and the rest of the ruins preserved and presented to the view of the general public. In the evening a highly effective torch-light procession passed through the streets in honour of the occasion.

SIR COUTTS LINDSAY proposes to have an exhibition of pastels at the Grosvenor Gallery in the autumn. This form of art has received much more attention lately in France than in England, but the practice of it is reviving here also, and if any number of artists of power and ability take it up the exhibition will be one of considerable interest.

WE publish in another column a correspondence between one of the competitors in the St. George's Hanover-square Baths competition and the Clerk to the Baths and Washhouses Commissioners. The correspondence speaks for itself, and readers can form their own judgment as to whether the line taken by the Commissioners is or is not unfair to the competitors. As we have said, we have little sympathy with the constant efforts of competing architects to upset the decision in a competition; and in relation to this competition we know that people interested in upsetting the decision have made, or attempted to make, a disingenuous use of the press in their own favour: we know this because one man, who admitted that he had an interest in one of the rejected plans, wanted us to accept an article on the subject from him; and we fear this kind of thing is done more often than innocent outsiders suppose. On the other hand, we have received indignant private letters from a member of the Vestry repudiating all idea of unfairness or favouritism, and stating that the Commissioners were under no obligation to say more than they had said. We think otherwise. It appears to us that the Commissioners have either been unfair to the competitors or unfair to themselves. If their reasons for declining to accept the assessor's choice were good ones, their best course would have been to have printed his report, exhibited the plans, and invited public criticism. They did none of these things; and it is not surprising that the competitors, rightly or wrongly, suspect that they have not been fairly treated.



## LETTER FROM PARIS.

THE *Salon* of 1888 is over, and the Palais d'Industrie will, after a few weeks, reopen its doors for one of the industrial exhibitions which are periodically organised under various titles, and which in general are really only huge bazaars for the sale of "articles de Paris." The exhibition next promised is under the high-sounding title of "Exposition de Sauvetage et d'Hygiène," and if it proves to be of real interest we shall give some account of it.

The *Salon* medals of honour in the sections of painting, sculpture, and engraving have been much disputed this year. After two sittings M. Détaillé had the paintings medal by 108 votes, against 23 for M. Benjamin Constant. The other names put up for the medal were those of MM. Roll, Henner, Albert Meissonnier, Polonceau, Humbert, Vollon, Flameng, Hébert, and Harpignies. In sculpture the contest lay between M. Tony Noël and M. Tuscany, author of the group in marble, "L'Aveugle et la Paralytique," the last being chosen by 98 to 24 votes. The result was a surprise to many, for the "Pro Patria moriuri" of M. Noël was generally considered the leading work of the year in sculpture. In the section of engraving the medal was awarded to M. Hédonin, M. Achille Jacquet coming next in the voting.

In the architectural section there was no such contest, the medal being awarded at the first "tour de scrutin" to M. Deglane. The other medals awarded in the architectural section were, "première médaille" to M. Girault; second medals to MM. Hardoin, Ruprich-Robert, Brasseur, Redon, Roussi; third medals to MM. Jay, Lafargue, Rigault, Paul Laffoye, Lewicki, and Augustin Salieron. Among twenty-four "honorable mentions" appeared the names of MM. Carle, Geisse, Goussier, Héneux, Lachouque, Laguerrière, Mousis, Sandier, and Schmitt; of the drawings exhibited by the last-named architect we have spoken particularly.

As for the "Prix de Salon," the council of the Beaux Arts, after a long discussion, decided that they would decline to award it this year.

The opening of the new Hôtel des Postes is at last definitely announced, and the new lifts made at the Carl factory are said to operate very satisfactorily. They are worked by steam. It is probable, therefore, that the postal service can shortly be transferred into M. Guadet's building, and the ugly sheds which the postal authorities have had erected on the Tuilleries site, for the temporary transaction of business, which, it is to be hoped, be removed at the first opportunity. Until the finances of the Government permit of the erection of an important building (palace or museum) on this site, it is intended to form it into an ornamental square, decorated with statues, at a cost of about 50,000 francs.

A good deal of work is going on now in the gardens in connexion with the Exhibition, the erection of various ornamental fountains, &c. The floor of the second story of the Eiffel Tower is laid, and it is intended that on the 14th of the month it should be made the point for the principal firework display of the National Fête. The same day, the mayors of 2,900 principal places in France, the senators, deputies, and the Parisian Municipality will take part in an immense banquet, which M. Alphonse has been commissioned to organise in one of the galleries in the Champs de Mars, temporarily decorated for the occasion.

We may mention, in the neighbourhood of the Exhibition, the rapid completion of the museum built at the cost of the Duchesse de Galliera in the Rue Pierre Chancou, from the designs of M. Giniain, and of which the facade combines picturesquely with the surrounding trees, and will add a pleasing feature to the architectural surroundings of the Exhibition, though its interior fitting up and occupation will not be complete for some time to come. The Musée Guimet, which in a decorative sense is not nearly so successful a building, is, however, completed and ready for opening, and the public will shortly be able to inspect freely the remarkable library of 13,000 volumes and curious collection of antiquities which M. Guimet brought with him from the East. Paris also possesses since the last few days another new museum of considerable interest, though unfortunately in a quarter not conveniently central. This museum, organised at Auteuil for the Science des Beaux Art of the city of Paris, includes statues and models of

all the works of architecture, painting, sculpture, and medallion, which the municipal administration has commissioned for nearly the last half-century. Among the paintings are some remarkable sketches by Ary Scheffer, Lehmann, Cogniet, and Delacroix. The museum includes, besides, some old paintings, mostly of a religious origin, portraits of deceased sovereigns, stray relics of successive revolutions, &c., and also the splendid municipal collection of tapestries, of which we have already spoken, and which up to this occasion had remained unknown to the public. While on the subject of museums, we should mention also the large glazed hall of the Musée de Clugny, recently opened after eighteen months' work, and which contains a curious collection of old French and Dutch furniture.

As usual, the National Fête, which does not this year present anything in its programme of special interest or novelty, will serve as the pretext for the inauguration of several public statues. On the 13th takes place the inauguration of the Gambetta monument on the Place du Carrousel. The work of MM. Aube and Boileau is already uncovered and open to view all round. Its appearance does not suggest any modification of the opinion we have previously expressed about it. The general outline is not pleasing, and the talent of the sculptor has not availed to redeem from triviality the effect of the statue in modern costume surrounded by allegorical figures, which recall to a certain extent the celebrated bas-relief by Rude of the "Chant du Départ," which decorates the Arc de l'École. On the 15th of July there will be inaugurated, almost simultaneously, the statue of Étienne Marcel in the garden of the Hôtel de Ville, and that to Sergeant Bobillot on the Boulevard Voltaire. The first, as we have already mentioned, was the work of Idراع, completed by M. Marquette; the second that of M. Auguste Paris. The pedestal for the Marcel statue has been designed by M. Albert Ballu, and that of the Bobillot statue by M. Lepouzé.

There will also be erected shortly, at the intersection of the Boulevard Hausmann and the Avenue de Messine a statue of Shakespeare, by M. Fourmier, of which the pedestal is designed by M. Deglane. This has been presented to the city by Mr. William Knighton, and the Municipal Council thus record their appreciation of this gift, in the words of the President of the Commission des Beaux Arts:—

"À la veille de la grande manifestation pacifique Internationale de 1889, cette inauguration permettra aux deux grands nations de se réunir dans un public hommage à ce qui forme le lien le plus solide entre tous les peuples, l'admiration et le respect pour le génie humain, symbolisés dans l'image d'un de ses plus glorieux et incontestés représentants."

The Municipal Council, who have purchased at the *Salon* the "Maternité" of M. Cordonnier, the "Drapeau" of M. Guadet, and the pretty group, "Frère et Sœur," by M. Albert Lefevre (three works of which we have made special mention), are now occupied about a scheme for locomotion, probably with special reference to the Exhibition year. The idea is to establish beneath the street level an electric tramway circulating in a tube built up of iron, of circular section and about 5 mètres in diameter. In this scheme, drawn out by the engineer, M. Berlier, and which has encountered no serious opposition on the part of the engineers in chief of the Public Roads Department, the first trial is proposed to be made between the Bois de Vincennes and Bois de Boulogne, along the line of the Rue de Rivoli, the Champs Élysées, and the Avenue Bojard, with a junction at the Place du Trocadéro. Subject to some unimportant modifications the project seems satisfactory, both in regard to public interest and to that of the City itself. It will present no great difficulty either in regard to the surface or the substructure of the public roads; it could be realised in a comparatively short time and without financial assistance from the municipality, and it would leave the field open to the ultimate establishment of the Metropolitan Railway. But the Council have not seen their way to adopt it in its present form, and have decided on adjourning it for further study and consideration,—unfortunately the usual fate in Paris of schemes for public convenience. It is the same with the question of the ruins of the Cour des Comptes and the reconstruction of the Tuilleries, and the same caution and procrastination will, perhaps, prevent for a long time

the rebuilding of the Opéra Comique. In regard to this latter, however, there are now some signs of definite action. M. Lockroy is bringing before the notice of the deputies the "projet de loi" for demanding a vote of 6,500,000 francs for the work, which will necessitate the demolition of some houses bordering on the Boulevard des Italiens, where the new theatre would have its principal façade. The question is, therefore, on the way to be put in official form. But considering the slow character of Parliamentary procedure, it may be doubted whether the present Legislature will actually carry out the scheme.

At the Institut, the Académie des Beaux-Arts has just given judgment on the Bordin competition, the subject of which this year was "L'Esthétique en Architecture." The first prize was awarded to M. Hervet for his essay on "L'Architecture et l'Esthétique des grandes Époques de l'Art." The second prize was given to M. Henri Descamps. M. Paul Dubois, a member of the Académie des Beaux-Arts, has just been re-elected for another term of five years as Director of the École des Beaux-Arts.

An architectural competition for the building of the Hospice Debrousses, in the Rue de Bagnolles, has just been terminated by the award of a premium of 3,000 francs to MM. Bernard & Desormaux for the design classed first; one of 2,000 francs to M. Hennain; another to MM. Delange and Bonenfant; and premiums of 1,000 francs each to MM. Lebrun, Roche, and Michelin. The drawings were exhibited at the Hôtel de Ville.

Reference has already been made in the *Builder* to the death of Paul Rajon, the etcher, whose genius was as well known in England as in France. We have also to record the decease of M. Félix Roguet, Honorary Architect of the City of Paris, author of numerous designs and some important restorations. He was for many years a devoted friend of and fellow-worker with Théodore Ballu, and participated with him in the restorations of St. Germain Auxerrois and of the Tower of St. Jacques la Boucherie, and also in the building of the churches of Ste. Clothilde and the Trinity. But it was especially in the restorations of the Hôtel Carnavalet and the Château de Chenonceaux that he showed his taste and knowledge. He had been commissioned to rebuild the Lycée Louis le Grand, a work which was interrupted by the attack of paralysis which caused his death. M. Roguet was born in 1822 and studied under M. Albert Lenoir.

We have to record also the decease, a few days since, of the historical painter Théodore Maillot, at the age of sixty-two. He was a pupil of Picot & Drolling, obtained the Prix de Rome in 1854 and a medal in the *Salon* of 1867. He was a conscientious artist, able in execution but cold in feeling, and whose instruction was much appreciated at the École des Beaux-Arts. He executed large decorative paintings in a good many public buildings, especially those in the Chapelle St. Gervais at the Pantheon. But in spite of a great amount of careful work, he will hardly leave a name in the art. He was a living proof of the prejudicial effect on the artistic spirit exercised by the official instruction system of the École.

We may mention that M. Maillot married the only daughter of the eminent architect Duban.

The death of the veteran architect, Alfred Armand, at the age of eighty-two, calls for more special mention. He died on June 27th, having for more than twenty years retired from practice; but from 1855 to 1865 he directed more works than, perhaps, any of his competers in France. He was born in 1805, and was a pupil of Provost and of Achille Leclerc, as well as of the École des Beaux-Arts, and exhibited at the *Salon* of 1855 a water-colour representing the Henri II. Gallery at the Château de Fontainebleau. The same year he became architect to the Versailles and St. Germain Railway Company, for whom he built the railway stations of Versailles, St. Cloud, St. Germain, and their Paris station, the buildings of which were only recently demolished in preparation for the new Terminus Hotel by M. Lisch. M. Armand subsequently became architect to the Railway Company du Nord, for whom he designed, from 1846 to 1851, the stations at Amiens, Arras, Douai, Lille, Calais, and St. Quentin, as well as the stations and workshops at Chapelle St. Denis, near Paris.

But the most important works carried out by



M. Armand were at Paris, where he was for twenty years (from 1853) one of the architects attached to the Compagnie Immobilière, for which, in conjunction with MM. Hittorff, Pellechet, and Rohault de Fleury, he built the part of the Rue de Rivoli prolongation facing the Louvre, and especially the Grand Hôtel des Magasins du Louvre; then, in collaboration with M. Pellechet, he built four considerable mansions in the Rue Halévy and the Boulevard des Capucines, and, under his sole direction, the Grand Hôtel on the same boulevard. He also designed a number of buildings for the "Crédit Mobilier," adjoining the extension of the Boulevard Malesherbes, the Hôtel of MM. Pereire in the Faubourg St. Honoré, &c.

M. Armand was made Chevalier of the Legion of Honour in 1847, and received a special recognition from the Académie des Beaux-Arts, a few years later, for his remarkable studies on the Italian medalists. He was in 1841 one of the first adherents of the Société Centrale des Architectes, and in 1855 was elected an Honorary and Corresponding Member of the Royal Institute of British Architects.

#### THE LINCOLN ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY AT BARTON-ON-HUMBER.

THE recent meeting of this Society at Barton-on-Humber, under the presidency of that veteran archæologist, the Bishop of Nottingham, deserves a special record, even though we have to give it a little after date. The members assembled on the afternoon of Tuesday, the 12th, and did not finally separate until Friday, the 15th ult. Many objects of interest were visited, and much good work was done.

The churches visited furnished a series of great interest. If there was an absence of buildings of commanding size or beauty, all that were seen were above the average as examples of Mediæval architecture. All were in good repair, with their chancels usually nicely arranged and fitted, and most had been recently restored, exhibiting much to commend and but little to regret, if we may except the scarification of the interior walls,—a senseless system, which has run riot in this district, as in Lincolnshire generally. It is to be hoped that this injurious habit of removing the inner coating of plaster, which it may safely be said was the universal covering of the interior walls of our churches, except where they were faced with ashlar, and exposing the rude random walling, has received an effectual check by the vehement denunciation with which it was visited, and that no more mischief of this kind may be done.

The churches of this district, lying, roughly speaking, between the Humber, the Trent, and the Ancholme, have a considerable family likeness. Western towers are the rule, and they are usually disengaged. They are commonly low. The lower parts in several instances, as at Alkborough, Winterton, Broughton, &c., show pre-Norman work, later than that we see in the well-known tower of Barton, but quite decided in its style. There are traces of long and short work in the west wall of the south aisle of the charming little Decorated church of Roxby,—a building with this exception "d'un seul jet,"—and in the south-west angle of the nave of Winterringham. There was not much Norman work. At Ferryby, above the arch of a later western porch, is preserved the tympanum of a doorway, representing in rude sculpture a bishop with pastoral staff in act of benediction, between two stars, with a "labarum" on each below.

The south arcade at Winterringham is of richly-moulded, semicircular arches, rising from cylindrical piers, with octagonal fluted capitals. On the opposite side the arches are pointed, and do not fit the huge cylindrical piers from which they rise. The square abacus marks these piers as earlier than those to the south. At Thornton Curtis the chancel is Norman, but very late; some of the scotches arches above the round-headed lights showing symptoms of a point. The north chancel door is a charming example. The font is almost a replica of the well-known Norman font in Lincoln Cathedral. The scale is of course smaller, and the work is more delicate, but the form and details are almost identical. Like the Lincoln font, it consists of a square basin, carved with griffin-headed animals in low relief, supported on a bulky cylindrical shaft in the centre, and a smaller shaft at each corner.

The material, black basalt, is the same. It is remarkable that the existence of this font, and its resemblance to that of the cathedral, seemed almost unknown to Lincolnshire men. At Barton itself, the tower of St. Peter's, which is well known as one of the best examples of so-called Anglo-Saxon style, exhibits the triangular-headed door and panels, its long strips of masonry dividing the outside walls into half narrow compartments, the long and short work, and baluster-shaped mid-wall shafts, characteristic of the age. The north arcade of the sister church of St. Mary,—a much finer and more interesting church, by the way, than St. Peter's, with the exception of the tower,—is Transitional, with pointed arches very richly zig-zagged, rising from huge cylinders. It is observable that the sharpness of the pointed arch increases very decidedly as the arcade passes from east to west, indicating a gradual development in style. The arcade at the eastern end has been altered, and a wide Decorated arch substituted for the narrower Transitional one. The opposite arcade is Early English, its early date being marked by the inverted Ionic volute of the twelfth century. The piers show a cluster of eight filleted shafts combined into one by a circular abacus embracing the whole.

The style which prevails in most of the churches visited is Early English, usually of a pure and well-proportioned type. The tower of St. Mary's, Barton, with the very fine shafted and richly-moulded doorways of the south porch and the tower display the architecture of the period in its best form, and the north aisle exhibits a fine series of well-proportioned lancets, displaced in some cases by wide uncomely square-headed windows of Perpendicular date. The tower, which would have been much improved by an additional story, has been capped by a cresting of eight pinnacles and a panelled parapet of Perpendicular date. Both St. Mary's and St. Peter's have their external outlines marred by the addition of a continuous Perpendicular clearstory with a flat roof, which dwarfs the towers, and makes the fabric too high. Neither church can be called well proportioned. The aisles have been widened, and the nave and chancel are both uncomfortably broad. But they are lightsome pleasant churches, and well adapted for the reception of a large congregation. Proud as Barton may well be to possess two such churches within a stone's throw of each other, it is a rather burdensome privilege; one of the two would be amply sufficient for the congregation, and as they have only one incumbent, and the two are never used at the same time, one may be pardoned for wishing for Aladdin's lamp to convey one of them away to some destitute parish where a church is needed. St. Peter's has been nicely restored; but much as the excellent vicar desires to carry out the same good work at St. Mary's the difficulty of raising the necessary funds stands in the way, and it is still encumbered with high square pews and a western gallery.

Passing from Barton, the Early English style is well represented in the chancel and south transept of Winterringham, which are lighted with excellently-proportioned lancets. The east gable is peculiarly dignified, with three lancets of equal height and a quatrefoil opening above. The removal of the clearstory renders the church inconveniently dark. The Early English of Alkborough is of the best kind, and deserves careful attention. The arcade has clustered piers with a circular abacus. The arches are well proportioned. As so often happens the two arcades slightly vary. The capitals on the south side are carved with stiff foliage, while those on the north are plain. The bases are well developed, and have noble suites of deeply-cut mouldings. The south door is shafted and of exquisite design. This church has been restored from an almost incredible state of squalor and ruin, by Mr. Oldrid Scott, and a new chancel erected, chiefly at the cost of the lord of the manor, Mr. Goulton Constable, of Walcot Hall. The whole work displays loving care and unstinting munificence. The oak benches and the open-timber porch are of very unusual beauty and costliness. The removal of the flat plaster ceilings and the restoration of the clearstory,—destroyed to save the cost of repair,—await more prosperous times for landlords. Mr. Oldrid Scott's chancel is a very carefully-designed and dignified work. It would have been better if, instead of decorating the side walls with a blank arcade, reaching to

the ground, which too much resembles blocked arches, he had been content with a continuous arcade not extending below the string-course beneath the windows. The effect would have been richer and more satisfactory. The Early English arcade at Winterton is peculiarly stately. The octagonal piers are unusually tall, and present the uncommon feature of a broad band encircling them half-way up, ornamented with the dog-tooth moulding. As at Alkborough, the Early English south door is a fine one. The plan of Winterton church is cruciform, with Early English transepts, duly gabled externally, but not properly prepared for by any distinction in the arcade within. This church, too, has risen from a condition of semi-ruin. But the good work was done at too early a period, and, much as one values the spirit which dictated it, there is little to commend in the execution. The plaster ceilings are especially offensive to the eye. But the church is in excellent hands, both clerical and lay, and all that can be done will be done and done well.

As already mentioned, the Decorated style is well displayed in the little church of Roxby, all of one date, with its pleasing low arcade, well-designed windows, and truly magnificent sedilia, with lofty ogee-headed canopies of much richness, flanked by tall pinnacles. In the south aisle there is a very fine priestly effigy beneath an arch. At Goxhill we have an interesting example of a well-proportioned Decorated nave, converted externally into a Perpendicular design by the widening and refacing of the aisles and the erection of a lofty clearstory and a fine western tower with eight pinnacles. The whole of this later work is of very unusual excellence. The masonry is admirable, and the base mouldings of bold projection and good character. The chancel, with its windows showing the gradual passage of single lancets into tracery windows, affords an interesting illustration of architectural history. There is a very noble military effigy in chain armour in the chancel. The neighbouring church of Ulceby, which is the only church in the district with a spire,—a tall and elegant one,—is also a good example of Decorated, but much over-restored. The south aisle is much wider than the north, and is treated separately with a distinct gable. The windows are good. Indeed, most of the Decorated windows of this district are quite above the average in purity of design. The so-called "Priory" of Goxhill proved on examination to be a fourteenth-century manorial chapel belonging to a mansion long since destroyed. It stands on a plainly-vaulted undercroft, converted into kitchens and dairies. The large Decorated windows,—three on each side,—are blocked up with ashlar. There is a very interesting priest's door and blocked squint on the south side, one communicating with the lord's chambers on the first floor.

Thornton Priory, with its magnificent gateway, and fragments of the lovely chapter-house,—once rivaling that of Southwell,—and of its south transept, was also visited. Of these exquisite though sadly scanty remains, much might be said, if so much had not already been written about them, rendering them some of the best-known fourteenth-century examples in England. They need more care than they seem to have, and the whole area of the church should be excavated and kept clear of soil. It must not be omitted to mention that among the objects inspected were the "Julian's Bower," or maze at Alkborough, and the magnificent Roman mosaic pavements at Horkstow and Roxby, which, by the kindness of the occupiers of the land, had been specially uncovered for the inspection of the Society. The meeting closed on Friday with a visit to the pre-historic boat cut out of one huge trunk, and the oenval raft at Brigg, and the churches of Broughton and Bigby.

E. V.

#### Sanitary Institute of Great Britain.—

The twelfth anniversary meeting of this Institute will be held at the Royal Institution, in their lecture theatre, Albemarle-street, W., on Thursday, July 12th, at three p.m. The chair will be taken by Mr. Edwin Chadwick, C.B. An address will be delivered by Dr. B. W. Richardson, LL.D., F.R.S., entitled, "The Storage of Life as a Sanitary Study"; and the medals and certificates awarded to the successful exhibitors, in connexion with the exhibition held at Bolton in 1887, will be presented.



# ARCHITECTURAL ASSOCIATION VISITS: YATTENDON COURT.

On Saturday last the members of the Architectural Association visited the country residence of the President of the Royal Institute of British Architects, Mr. Alfred Waterhouse, B.A., by whom they were most cordially received and hospitably entertained. The house is situated in the midst of beautiful scenery, and stands on the top of a hill 450 ft. above the sea level, and formerly used as one of the chain of beacons of Elizabethan times. The remains of the Elizabethan beacon were found by Mr. Waterhouse when digging the foundations of his house, the date being attested to a certain extent by the discovery of a token representing the amount of bounty payable to the volunteers who accompanied Sir John Norreys in his fruitless expedition to Lisbon. This Sir John Norreys was lord of the manor of Yattendon, and died in 1597. Mr. Waterhouse also found in the course of his excavations a valuable collection of prehistoric bronze weapons, fifty-nine in number. These are believed to be of different dates, and hence it is supposed that they were deposited as a hoard for the sake of security, probably by some pedlar. A curious portable sundial, in the form of a ring, was also found; and in the kitchen garden, some Mediæval glazed bricks and wall decoration.

A considerable amount of historic interest, chiefly traditional, attaches to the neighbourhood of Yattendon. It is believed to be the Ethandune of the Saxon chronicle, where in A.D. 878 Alfred attacked the Danes and captured their camp. Tradition says that the battle was fought on July 10th, the feast of St. Peter, and was commemorated for many generations by the revels kept up on that day. The church is dedicated to St. Peter, and this may account for the selection of that particular day for the annual *festa* of the village. Ethandune in Saxon times belonged to the Crown, and in Alfred's will he bequeaths it to his wife. Evidence of Roman times has been found in the remains of a villa discovered at Everington in the parish of Yattendon, the field having been traditionally known as *Cæsar's*, even before the discovery.

There also exist in the parish some excavations in the chalk of considerable extent, which have been supposed to have served as *cave dwellings*.

At the Conquest the manor was given to De la Beche, in whose family it remained for three centuries; it afterwards belonged to the Norreys, by one of whom the church was rebuilt in 1450.

The residence of the present Lord of the Manor, Mr. Waterhouse, was built in 1879, and is of red local brick with buff terra-cotta dressings and Ruscon tiles. A conspicuous feature of the exterior is the tower, in which is the great water-tank, and from the top of which, 500 ft. above the Ordnance datum, are obtained extensive views over the valleys of the Pang, the Kennet, and the Thames, to the hills of Hampshire and Oxfordshire. The front entrance has on the right the hall, of ample size, and lighted from the entrance front, and on the left the principal staircase. The dining-room, library, and drawing-room face the garden, which is entered from a verandah opening into the dining-room, and also from the hall. A charming interior effect is obtained by the vista from the drawing-room through the doors of the library to the fireplace of the dining-room, these three rooms being *en suite*. On the upper floors are Mrs. Waterhouse's boudoir and the bedrooms, which are distinguished by such names as Humility, Peace, Rest, Mercy, Joy, Valour, Honour. Among the interesting features of the house is the Turkish bath, situated in the basement under the hall, and consisting of three rooms, an apodyterium, a tepidarium, and a lababo. The walls are faced with tiles, the upper part being ornamented with casts from the sculptures of the Panathænaic procession in the frieze of the Parthenon.

The fireplaces are chiefly open hearths, wood being principally burned, and have chimney-pieces of various marbles. In the hall is a charming inglenook, with marble seats and tile lining.

A compactly-planned range of buildings contains the stables, with coach-house and harness-room, the laundry, and drying-room, and the gardener's house, and on the south side of the

block is a series of hot-houses for fruit and flowers.

In the village the influence of the lord of the manor is also evident. A new club-house, given by Mr. Waterhouse, and a co-operative store, which has proved invaluable in cultivating the thrift of the community, are instances of the squire's interest in his neighbours. Other points of interest are the church, built in 1450 by Sir John Norreys; the manor-house, a veritable Queen Anne building, with excellent carved woodwork internally; and a manorial barn, with a fine open-timber roof.

## THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION:

SOME FURTHER EVIDENCE.\*

The Royal Commission presided over by Lord Herschell for investigating and reporting upon the working of the Metropolitan Board of Works has held two sittings since the publication of last week's *Builder*.

At the sitting held on the 29th ult., Mr. Richard Frost, Mr. George Thomas Brown, and Mr. Frederick Gannaway, who had been tenants of public-houses acquired by the Board, were the first witnesses called. Mr. Gannaway deposed to having made "presents" to Goddard, senior, because he (witness) "saw which way the wind blew." Altogether, he gave Goddard three cheques for 75*l.* each, and one for 37*l.* 10*s.* He also gave Matthew Goddard 100*l.* Though he thought it well worth his while to pay the money, he thought it was being extracted from him, but he was not a common informer, and it did not occur to him to communicate with the Superintending Architect as to the exactions.

Mr. C. J. Phipps, F.R.I.B.A., recalled, said he wished to correct one or two points in the evidence he had already given. Since he formerly appeared on the witness-stand it had been brought to his knowledge by some memoranda that in 1884 he made Mr. F. H. Fowler, then and until lately a member of the Board, a present of 40*l.* It was a purely voluntary gift, in consideration of Mr. Fowler's trouble in advising witness as to the course to be adopted in regard to Hengler's Circus, which had been closed by order of the Board for structural reasons, not being fireproof. He (witness) was acting for the proprietors of the theatre. By the advice of Mr. Fowler he wrote to the Board, asking that the matter should be referred to the Theatres Committee, who would have to report to the Building Act Committee. The proprietors of the building were anxious to prevent the announcement that it had been condemned from appearing in the newspapers. He asked to be allowed to appear before the Committee with a model of the building as it was proposed to be altered. He subsequently attended the Committee, and it was after doing so that he gave Mr. Fowler the 40*l.* He (Fowler) did not ask for it, nor was there any previous condition or arrangement of any kind that he was to receive it. It was a voluntary present to Mr. Fowler "because he had served witness's client." Witness knew that Mr. Fowler was a member of the Theatres Committee. In answer to further questions by the President, witness stated that he was aware that the 200*l.* paid by Hobson to Fowler in respect to sites in Shaftesbury-avenue had been returned by the latter. He (witness) was simply the intermediary in the matter. At an interview he had with Mr. Fowler, the latter said to witness: "I find Mr. Hobson's name is considerably mixed up with Mr. Robertson, and, as you are aware, I have had a cheque given to me by Hobson for 200*l.*, which ought not to have been sent to me." He asked witness to take the cheque, and witness agreed to do so, but said it would not cancel the transaction. The 200*l.* in question was returned by witness in July of last year to Hobson. Lord Herschell having referred to the Board minutes, and to the minutes of the Theatres Sub-Committee and the Building Act Committee, which showed that Mr. Fowler had voted in favour of witness's proposals, Mr. Phipps said he wished to say that he had been connected with twenty-two different places of amusement, twelve of these being new theatres. His memory was perfectly clear on those matters, and he could say that he had never, directly or indirectly, given any member or official of the Board one single farthing other than already mentioned.

\* For a summary of the evidence previously given see last volume of the *Builder*, pp. 434, 446, 466.

except this: He found he had paid ten guineas to two junior clerks of the Board for copies of survey plans of the Globe Theatre. He had Mr. Hebb's permission for the clerks to let him have tracings of the survey plans. A subsequent application of a similar character, — he was not sure whether to Mr. Hebb or not, — was refused.

Mr. Thomas Verity, F.R.I.B.A., said he was employed as architect by the proprietors (Spiers & Pond) of the Criterion Theatre, which was after a time pronounced by the Board as unfit for use as a theatre. Mr. Haines was acting as Spiers & Pond's agent, and it was suggested that they (Haines and witness) should see Mr. Saunders, then a member of the Board, in order to get some information why the theatre had been condemned. He saw Mr. Saunders on three occasions, and talked over the matter, but Mr. Saunders did not do anything in regard to the plans that were to be submitted to the Board beyond suggesting how they should be coloured so as to be readily comprehended by the Committee of the Board. He (witness) never saw nor had any communication with Mr. Fowler on the subject of these plans, but he believed that Mr. Webster, the contractor, saw Mr. Fowler about them. Witness did not mention anything to Mr. Saunders about payment, but he understood that he was to be paid. In 1893 Spiers & Pond bought the site of the Cock Tavern, in Fleet-street [they subsequently sold it to the Bank of England for the new Branch Bank which is now approaching completion]. Mr. Saunders was engaged by Messrs. Spiers & Pond in that matter along with witness, as the firm felt it was under an obligation to Mr. Saunders over the Criterion Theatre matter. He (witness) shared his commission of 7½ per cent. on the Cock transaction with Mr. Saunders, who received 450*l.* from witness at the conclusion of the business. Asked by Lord Herschell whether Mr. Saunders took a joint share of the work, witness replied that there was no work at all.

Mr. John Alexander James Woodward said he was an architect and surveyor, and was a District Surveyor under the Board. He was until recently in Mr. Saunders's office as an assistant. He had known Saunders for more than thirty years. It was true that he had received some money (200*l.*) in connexion with the Pavilion Music Hall business. He met Mr. Villiers by arrangement in Robertson's office at the Board of Works. The suggestion was that he (witness) should see Mr. Saunders and ask him to give what consideration he could to the claims which Mr. Villiers had upon the Board as an old tenant. Robertson introduced witness to Mr. Villiers. He subsequently saw Mr. Saunders, who said he would give consideration to the subject, but he inquired who was going to act professionally for Mr. Villiers. Witness told him that Mr. Villiers had no architect, for he (witness) had previously seen that that "little difficulty" would arise, — that is, that he thought Mr. Saunders might desire to act for Mr. Villiers. All this was before Villiers had got the site. The 200*l.* he (witness) received was, he thought, for the introduction, and for persuading Mr. Saunders afterwards to adopt the elevation of the 200*l.* Worley. Did not share any portion of the 200*l.* with Robertson or any one else. Had been engaged up to twelve years or so ago in giving evidence in compensation claims against the Board; believes he shared half his commissions on such business with Mr. Saunders, who was a member of the Board at that time.

Mr. Robert Walker, F.R.I.B.A., was the next witness. He said that he was an architect and surveyor, and also held the appointment of District Surveyor for the Strand District. He had had some correspondence with the Board's officials with reference to the Avenue Theatre. He stated that he had been consulted in connexion with the ancient lights and other matters, and was requested by Mr. Villiamy to give his views respecting the site, and he accordingly sent in some drawings, which partially assisted Mr. Villiamy, the then Superintending Architect. That gentleman, however, told him to be very careful not to get into any controversy, because one of the architects of the theatre was a member of the Board. But Mr. Villiamy did not ask witness to favour the member. He (witness) had nothing to do with Robertson. In answer to questions by Mr. Meadows White, Q.C., the leading counsel for the Board, witness said that there had been a long correspondence between him and the Board with regard to the



Avenue Theatre and its safety; he wrote angry letters to the officials, and was in consequence three hours "court-martialled" before the Board, but ultimately the Board endorsed his action, though deciding that he had been indiscreet.

Mr. F. Statham Hobson, recalled, said that the "Cook" Tavern property was in the City, and not connected with the Board. He also said, with reference to the 200*l.* paid to Mr. Fowler, that in the summer of 1887 Mr. Phipps called on him with a message from Mr. Fowler and a cheque for 200*l.* Mr. Phipps said that Fowler wished him to return the 200*l.*, as in the inquiry at the Board about Robertson witness's name was mixed up, and Fowler did not wish it to be said that he had had any money from witness, for he would rather lose the money than have any cheque of witness's. Witness took back the cheque, but stated that it could not cancel the transaction, and that if asked whether any payment had been made to Fowler, he should most certainly state it. Witness wished to correct or add to his previous evidence by saying that he did not wish in the smallest degree to convey that he did not know that Mr. Fowler was an active member of the Board. On the contrary, he knew that Mr. Fowler's influence was material and necessary to him (witness), and that Mr. Phipps had arranged matters to secure it. He (witness) had had no other transactions in which individual members of the Board had been interested.

Mr. Francis Hayman Fowler, F.R.I.B.A., recalled, said that he received 100*l.* for advice given in connexion with a proposed alteration of the Criterion Theatre, but that advice was given in regard to the improvement of the ventilation of the theatre rather than with regard to its exit. Mr. Webster, the contractor, asked him to go and see the theatre, but nothing was said about payment for his services. He did not write a report on the subject: everything was done *visu voce*. He knew that Mr. Saunders was employed in connexion with this business, but did not know what he received. He was on the Theatre's Sub-Committee before whom the plans came, but it never occurred to him that the payment of the 100*l.* to him was a bribe. The 40*l.* Mr. Phipps gave him was in connexion with another matter was a voluntary gift. As to the 200*l.* received from Mr. Statham Hobson, he confirmed the account given by Mr. Phipps of the circumstances attending its return to the giver. It did not occur to him that there was anything wrong in the transaction by which he received the 200*l.* He did not inform the Board that he knew about Mr. Statham Hobson being mixed up with Robertson. It was known there; at any rate, it was whispered very strongly that Statham Hobson and Robert on had certain "amicable arrangements." Witness did not take any steps to induce the Board to investigate these matters. After the witness had given answers to some further questions, Lord Herschell warned him that he had not been candid in his admissions, and the consequences to him might be serious if he were not careful.

Mr. Robert Evans, an architect and surveyor, next gave evidence with regard to the plans for a new estate that was laid out in Albany-road, Camberwell, for Mr. Earle Bird. Witness said that he prepared the plans for the estate, but he could not get them passed for some weeks by the Board of Works. Ultimately his client took the plans to Mr. Saunders, whom he knew, and witness believed Mr. Fowler was also consulted in the matter, and eventually the plans were passed. These were not altered by either of those gentlemen except very slightly.

Mr. James Snelling deposed that he was a Vestryman of Lambeth, and was acting with other people at Brixton who had formed themselves into a syndicate for building a new road of shops from Brixton-road to the Atlantic-road. He had known Mr. Fowler a great many years, and when Mr. Fowler heard of the scheme, he asked witness to introduce him as architect. Witness told him it would be of no use, as he (witness) had already introduced an architect, Mr. Evans, and he could not think of having any one else. Mr. Fowler replied, "Oh, it would be advisable, because I could make things so easy for you. I could make a nice promenade in front for you." Witness said that he and his friends were asking the Board for nothing, as the plans submitted for the work complied with the Board's

rules and regulations. Two or three weeks afterwards, Mr. Fowler again mentioned the subject. Witness told him that the syndicate could not entertain his proposal, whereupon he said: "You are very foolish: I should have done you a lot of good." Some four months afterwards they sent the plans to the Board, but could not get them passed for a long time, although they had been approved by the Vestry.

Other evidence having been given, the day's proceedings terminated.

#### THE ST. GEORGE'S HANOVER-SQUARE BATHS COMPETITION.

WE have been requested to publish the following correspondence:—

"9, Victoria-chambers, Westminster,  
June 5th, 1888.

To the Vestry of St. George, Hanover-square.  
Re New Baths and Washhouses.

Gentlemen,—I have been requested by some of the architects who were invited to compete for the above to express their feeling of dissatisfaction with regard to your decision in the above competition.

The competitors were assured in the instructions from the Commissioners that an architect of established reputation should act as assessor, and, as in the cases of the Admiralty and War Office, the Law Courts, the Glasgow Town-hall, the Manchester Town-hall, and all public competitions, this was understood to imply that the assessor's decision was to be final and binding unless some just cause could be assigned for acting to the contrary.

The competitors are surprised to find from the Commissioners' report that they have rejected the design which the assessor selected, and, moreover, have declined to produce his report.

And, further, that the design selected by the Commissioners, according to their own statement, is defective and will require "to be considerably elaborated and a few modifications" made in it.

They are also surprised that as the selected design cannot be carried out for the amount stipulated in the instructions, viz., 30,000*l.*, that this fact of itself did not disqualify it.

As the competition has entailed a large expenditure of time and labour on the competitors, they respectfully request that you will, in justice to them, reconsider your decision, and act on the assessor's award, and also publish his report.—I have the honour to be, gentlemen, yours obediently,  
JAMES WEIR, F.R.I.B.A.,

"St. George, Hanover-square.  
(Commissioners for Public Baths and Wash houses).  
1, Piccadilly-road, S.W.

Sir,—Your letter dated 5th inst. addressed to the Vestry, was read to the Commissioners at their meeting yesterday, and I was instructed to inform you that the Commissioners see no reason to take any further action in the matter.—I am, Sir, your obedient servant,

(Signed) F. W. DOGGETT, Clerk.  
James Weir, Esq.,  
9, Victoria-chambers, Westminster, S.W."

#### THE MARINE BIOLOGICAL LABORATORY, PLYMOUTH.

THIS Laboratory, which was opened on Saturday last, has been established at Plymouth chiefly through the exertions of Professor Ray Lankester, for the study of marine biology. The building, which is erected on a site in the Plymouth citadel, granted for the purpose by the War Office, possesses no architectural attractions externally, though it appears to be considered as well arranged for its technical purpose. The following comments on the interior arrangements we take from an article in *Nature* of June 28th, written of course from the biological point of view only:—

"The laboratory which has been erected upon this site is admirably adapted to the purposes of the Association.\* It is, indeed, more than a laboratory, it is also an aquarium, whose tanks are extensive, and fitted with every improvement that modern science can suggest. The total cost of building, machinery, and fittings, including all fees, has been about 12,500*l.* The structure comprises a central portion, with a wing at either end. The east wing is almost wholly taken up by the residence of the director, and needs no further comment. The west wing has on the ground-floor the caretaker's rooms, and a receiving-room, into which the results of the day's fishing will be brought for examination. On the first floor are chemical and physiological laboratories, and on the second floor a library, a work-room, and lavatory. The main part of the building contains on the ground-floor the aquarium or tank-room, and on the first

\* *I.e.*, the Marine Biological Association, under whose direction the laboratory will be worked.

floor the large laboratory. The tank-room is fitted with slate and glass tanks, of which one on the northern side is a noble window-tank, 30 ft. in length, 9 ft. in breadth, and 5 ft. deep. There are three large window-tanks on the north side, nine smaller window-tanks on the south side, and a series of five table-tanks in the middle of the room. The tanks are supplied with salt water from two reservoirs, capable of holding 50,000 gallons each. From these the salt water is led by means of pumps, through vulcanite pipes into the tanks; the openings of the pipes are placed rather more than a foot above the level of the water in the tanks, and are provided with nozzles through which the water is forced at high pressure, so as to form jets descending deep into the tank and carrying with them a quantity of atmospheric air. Circulation has been established in the tanks for the last fortnight, and there is every reason to be satisfied with the arrangements for aerating the water. The jets carrying down the air deep into the water of the tank cause it to be filled with minute bubbles so as to resemble champagne, and all the animals that have hitherto been placed in the tanks are thriving in a remarkable manner, which is the more surprising, as new tanks are generally supposed to be highly injurious to organisms introduced into them at an early date. It would be too much to expect that tanks, which have been so lately put up, should be fully stocked within a fortnight, nevertheless they will present to the visitors on Saturday next a sufficiently interesting collection of local marine forms. For the rest, the tank-room is a plain room, without any attempt at ornamentation. It is felt that the scientific nature of the institution must be kept in the foreground, and therefore nothing has been done to make the aquarium a place of popular amusement.

The main laboratory is at present fitted with several compartments, each to contain a single naturalist, along its north side. When the necessity arises, similar compartments will be placed along the south side. In the centre of the room is a series of slate and glass tanks supplied with salt water from the circulating pumps. Beneath these a convenient shelf has been arranged, so that naturalists will be able to arrange for themselves any temporary apparatus that they may devise on as small a scale as is desired."

We quite agree that a building such as this should be designed mainly in reference to its practical requirements, but we presume that some one must have been concerned in planning and designing the building, which is stated by our contemporary to be so well arranged for its purpose, but of which no architect's name is mentioned, any more than if the building had developed itself by spontaneous generation.\*

#### Illustrations.

##### RENAISSANCE GORGEOUSNESS.

IT may be objected that we have chosen a rather ugly title for the drawing which we publish this week, but what it lacks in elegance must be excused because it exactly describes the style of church architecture attempted to be portrayed by our illustration, that particular phase of the Renaissance which prevailed in France, Spain, and the Netherlands upon the abandonment of the Gothic and the overthrow of Mediaeval traditions. We exclude Italy, because in that country Renaissance architecture assumed a decidedly Classical character from the very first, and never partook of the mixed style which is to be noticed in the sixteenth-century architecture of other European countries. But in France and Spain especially, the old Gothic methods of construction, of proportion, subdivision, and grouping, continued long after all detail had become entirely Classicalised. Interesting examples of these are to be seen in St. Eustache, Paris, and the Cathedral of Granada (of course we do not include the west fronts of either church or the Royal Chapel of Granada Cathedral). Upon looking for the first time at the interior of either of these churches, one would certainly class them as Gothic buildings, but a closer inspection will serve to show that neither of them possesses a single Gothic detail. It is a rather singular fact that in all earlier developments of the round-arched architecture, the style began by being very plain and severe, and developed detail and ornamentation as it became more matured; but in the Renaissance exactly the reverse was the case. It came in with ex-

\* We have since learned that the general arrangement of the building was due to Professor Lankester; the details were carried out by Mr. J. C. Inglis, engineer, of Plymouth, and the design of the "front" seems to have been supplied from the War Office.



berance of detail and ornamentation, and got plainer and plainer as it developed. There can, however, be no doubt that the earlier examples of the Renaissance, notwithstanding their over-richness and inclination to gorgeousness and incongruity, are far more original and interesting than the later developments of the style, and even the greatest upholders of architectural purity have found themselves unable to withhold their admiration from St. Eustache, Paris. There are many advantages possessed by these early Renaissance buildings which might make it advisable to give the style another trial. It undoubtedly lends itself better to modern sculpture and painting than the Gothic does, and it is less formal and cold, especially for churches, than the more classical Italian style. Our drawing is a composition intended to represent a church consisting of nave and aisles, with the very lofty columns so peculiar to the style, transepts, and long aisleless choir, with a lantern over the crossing. The altars, organ, and monuments are in accordance with the particular period.

We may just mention the fact that one of the most beautiful examples of early Renaissance ornamentation to be seen in this country is the glass in the east window of St. George's, Hanover-square. It is said to be the work of the elder Holbein, but is more probably that of Aldegraver.

H. W. B.

#### THE DUCAL PALACE, VENICE.

MUCH as this building has been drawn, painted, and otherwise illustrated, a reproduction from a good photograph of it may be valued by our readers, the more because, as Mr. Ruskin has pointed out, the peculiarities of the detail, slight but exceedingly characteristic, have often been misrepresented in drawings.

The building had many various phases in its history; the front as seen now was built under Doge Mocenigo in the early part of the fifteenth century, though Fergusson gives strong reason for believing that the mass of wall above the arcade was never at first intended; that the upper wall formerly coincided with the back wall of the arcade, and was moved forwards towards the end of the fifteenth century, in order to obtain more internal accommodation.

This overweighing of the arcade by a mass of walling has nevertheless come to be regarded, from association, as a beauty, and it may be said that the building has been admired much more indiscriminately than its merits as a whole by any means deserve. The architectural design of the two arcades, however, is fascinating in its semi-Oriental grace, and the taste of the world has been taken captive, perhaps, partly by the very audacity of piling so heavy a mass upon so light a substructure: a process which, if it is in defiance of logic, at all events conforms on the building that saving quality,—character.

#### NEW ALTAR FRONTAL, ST. PAUL'S CATHEDRAL.

In the general design of this work, which forms the subject of one of our illustrations, the central subject is a representation of Christ in glory surrounded by adoring angels, and seated on the rainbow giving the crown of martyrdom to Saint Paul, and on either side are illustrations of important events in the life of Saint Paul. One of these shows the Martyrdom of Saint Stephen, rays of glory falling around the prostrate form of the saint, while Saul of Tarsus is seen standing as a witness to his death. In the other space is shown Saint Paul in fetters before King Agrippa and his sister Bernice, who are dressed in rich attire and seated on a gorgeous throne, the ends of which are formed of golden lions, and at the back is a most elaborately-worked curtain. The figure of Cornelius is seen in the background.

Between these subjects are single figures under arched canopies, representing the four archangels. The super-frontal is composed of half-length figures of adoring angels, two over each subject, with ornamental scroll-work between. The prevailing colours throughout are red, gold, and white, and various shades of rich browns.

The whole of the work, which is 11 ft. in length, has been executed at the East Grinstead School of Embroidery, 32, Queen-square, W.C., and has taken nearly three years to complete, no pains having been spared to render it a success. It has been presented by

Miss Noyes to St. Paul's Cathedral, and has been designed by Mr. John Medland, of the firm of Medland & Powell.

Space would not admit of arranging the larger scale illustrations of the subjects in their actual relative positions, but their arrangement will be easily seen on reference to the small key elevation.

#### NEW BARRACKS, PLACE MONGE, PARIS.

THE new barracks of which we give the façade towards the Place Monge are from the plans and designs of M. Achille Hermant, architect. The building is in reality only an enlargement of the old barracks of the Garde Républicaine of the Rue Mouffetard. The new buildings are especially intended for officers' quarters; and inclose between their two wings a vast rectangular court, on which open the men's quarters. It is planned to accommodate three companies of infantry and half a squadron of cavalry, or 588 men and 182 horses.

The work was commenced in November, 1883, and completed in March, 1886, but the building was not occupied till early in 1887. The estimate was for a little over two million francs, but the sum actually expended was only 1,636,604 francs; a rather notable instance of a building coming, by a considerable amount, below the estimate given for it.

The building is very conveniently planned, and constitutes a good example of modern French military architecture.

#### OLD COTTAGE ARCHITECTURE.

THOUGH our old cottages have long been favourite subjects for painters, and though they have evidently been studied by many of our architects, I do not know of any attempt at systematic illustration of them from an architectural point of view.

Years ago I published in the "Spring Gardens Sketch-Book" a good many illustrations selected from numerous sketches of cottages in South-west Surrey, a district where they are perhaps to be found in greatest picturesqueness.

Since then, material from different parts of the country has accumulated, and I now propose to treat the subject in a series of sketches, believing that most useful lessons may be drawn from a study of old examples, especially in the enforcement of that essential and too much neglected quality of simplicity.

My subjects will be chosen from an architectural rather than a picturesque point of view, and my aim will be to give an intelligible rendering of the architecture, to the exclusion of the picturesque accidents of light and shade.

I do not intend to confine myself entirely to cottages, but to include other domestic buildings, as long as they are of the same character and not of more strictly architectural design.

My first series will be taken from the south-west corner of Surrey. The cottages and old houses in this part are almost entirely of timber-frame work, otherwise known as "post and panel." The frame is of oak, and the panel is formed by fixing upright hazel-rod in grooves cut in top and bottom, and by then twisting thinner hazel-wands hurdle-wise round them.

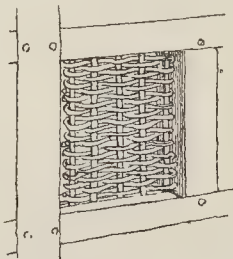


Fig. 1.

The panel is then filled up with a plaster of marly clay and chopped straw, and finished with a thin coat of lime plaster. The same system is used for inside partitions, and occasionally the lattice is formed with oak laths. The notching shown on the face of the post in the second illustration is generally found on main posts, and was made to receive the ends of supporting struts while the frame was being

put up. Often the panels are filled up with brickwork set in herring-bone fashion. The grey oak and red brick form a pleasing change to the ordinary black and white, but the system is very unsuited to the sides that are exposed. The blacking of the timber is, I believe, quite a modern though a useful innovation. In this part, at least, the timbers have been usually left unpainted, though possibly only from motives of economy.

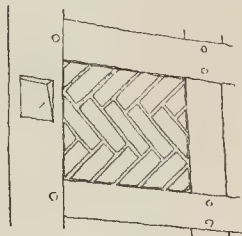


Fig. 2.

In this part of Surrey, more perhaps than anywhere else, one finds the walls covered with weather tiles. This, I conclude, was done at a time when the timber had begun to decay on those sides exposed to the fierce south-west storms. It is, I believe, of no very ancient date, and I doubt if it has been in extensive use for much more than the last hundred years.

The date of cottages in this part of the country seems to be chiefly about the latter part of the sixteenth century and beginning of the seventeenth. Though there were certainly cottages before that, it was at this date that the great change of ownership took place, and also the great change in the mode of life. Previously to this the labourers on an estate had lived in the farm-houses and manor-houses, but about this time the old common-hall life was done away with, and we find almost always the old hall itself cut in two by a floor converting the upper part into bedrooms.

The enclosure of the commons also disturbed the old patriarchal form of life, and created a demand for smaller independent homesteads, and for cottages on the estates of the great landlords. Down to recent times there does not appear to have been any great demand for increased accommodation of this sort, and work chiefly consisted of additions of lean-to's, sheds, and sometimes new wings, and of repairs.

Although the timber on the north and east sides of the buildings is generally as sound and sharp at the edges as the day it was framed, there are cases even there, where the drip of the eaves has caused decay, and where the bottoms of the posts and the sills, resting on a damp substructure, have rotted away. These defects are intensified on the south and west sides, where often all that is left of the timber is the hardened skin and the very hardest parts of the heart of the oak.

The rotting of the ends of the posts has commonly caused the settling of the building into all sorts of picturesque but uncomfortable levels. In restoring any timber building the frame should always be raised to its original level by the use of screw-jacks. This can generally be done without serious difficulty. I had a large and fine timber house in Sussex supported entirely on ten screw-jacks and brought back almost to its true level.

In future articles I hope to furnish further notes on different structural parts.

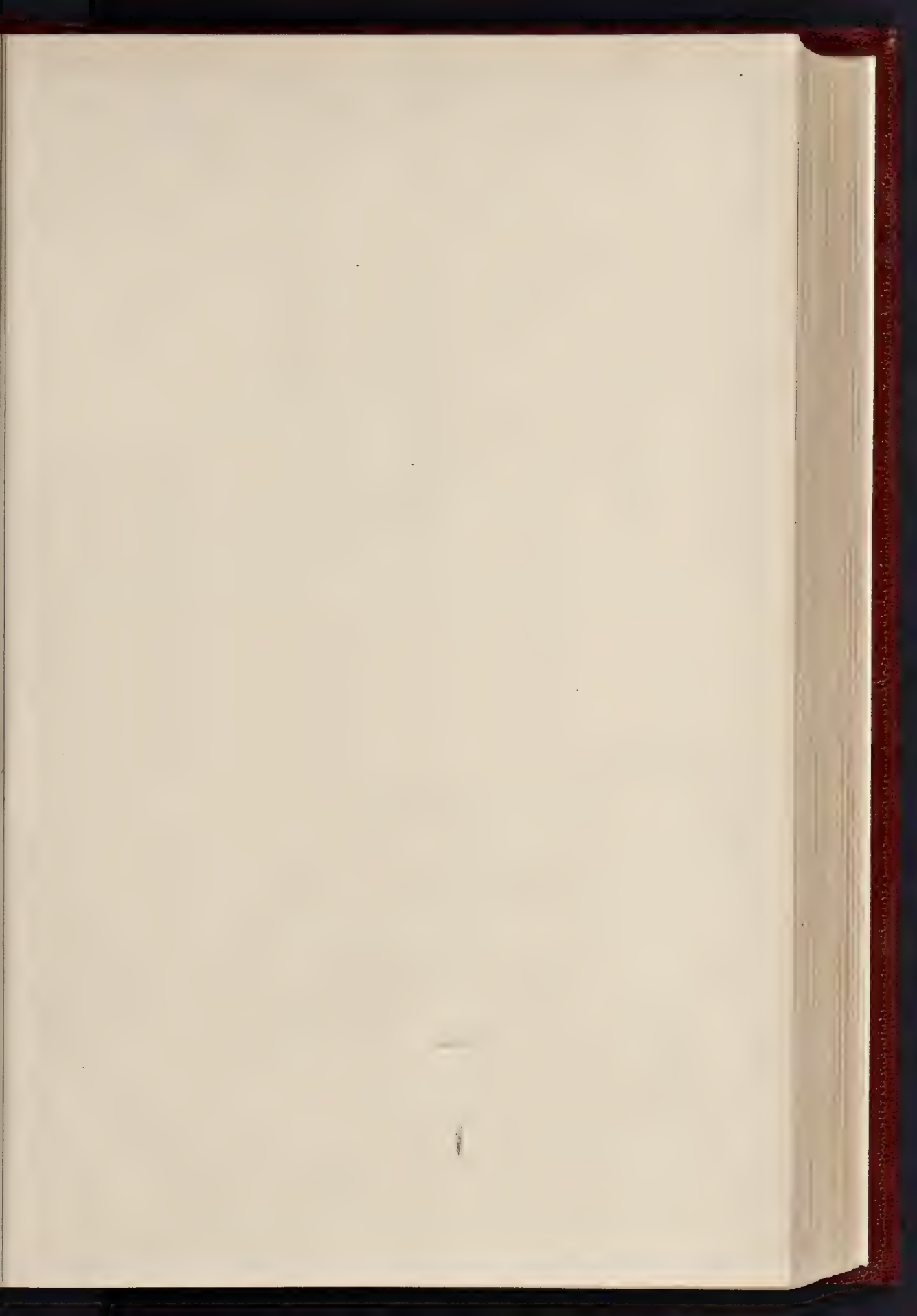
Features to be noted in the present illustrations are the manner in which the apex of a hip is always formed by leaving a little gablet; the same thing will be found invariably done with haystacks, and in the absence of specially-made end ridge tiles it has obvious advantages.

It is customary also to start the two roofs at different levels, so that the two dripping eaves do not meet at the hip.

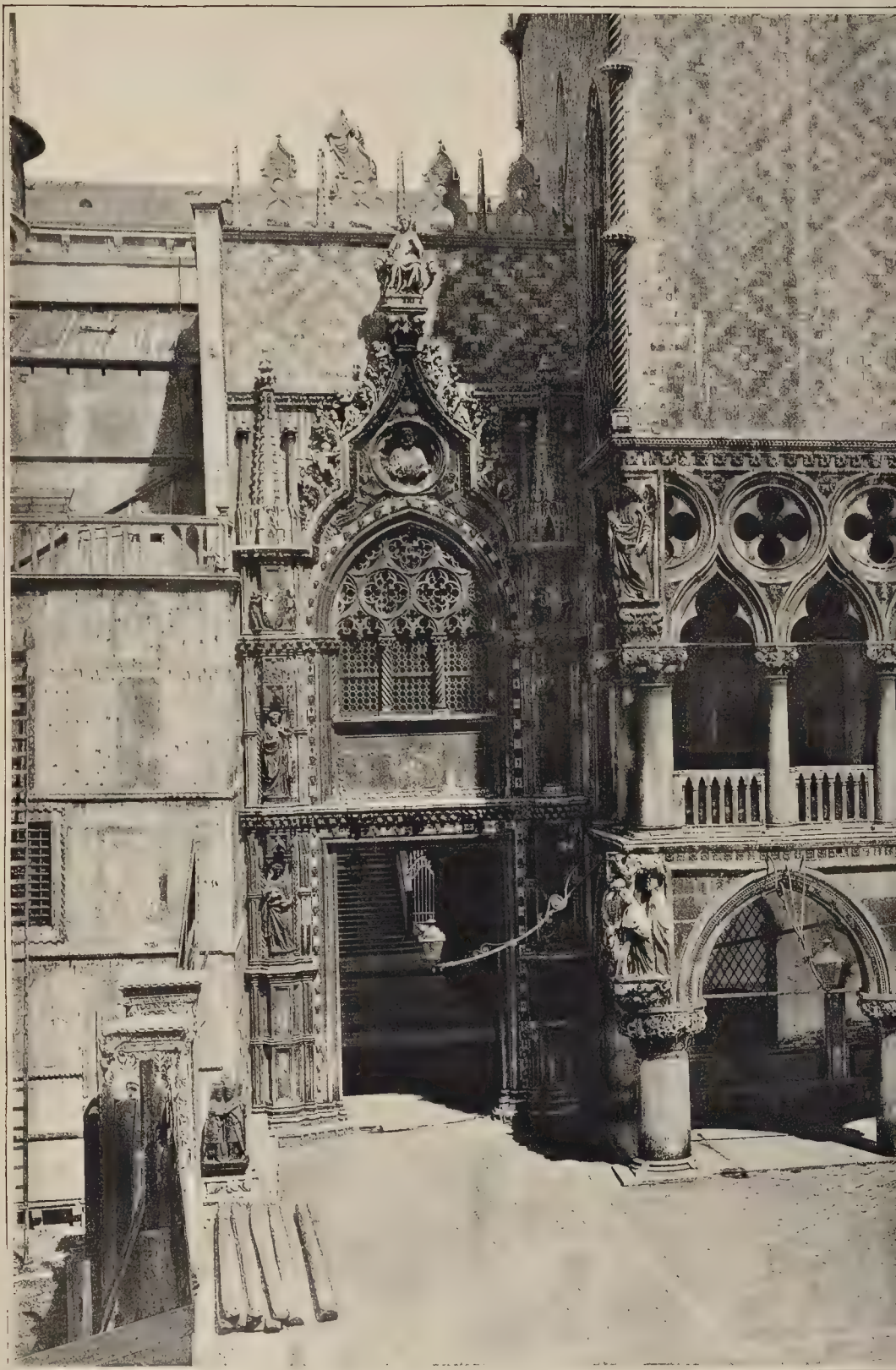
Large hipped roofs of wide span, such as that of the White Hart Inn, I take to be generally characteristic of earlier buildings.

Rake House is of some pretensions, dating from the end of the sixteenth century, and having belonged to members of the household of King James I., of the names of Bell and Smith. The windows still retain some coats of arms in coloured glass, and two rooms of oak panelling with excellent carved mantelpieces. I have







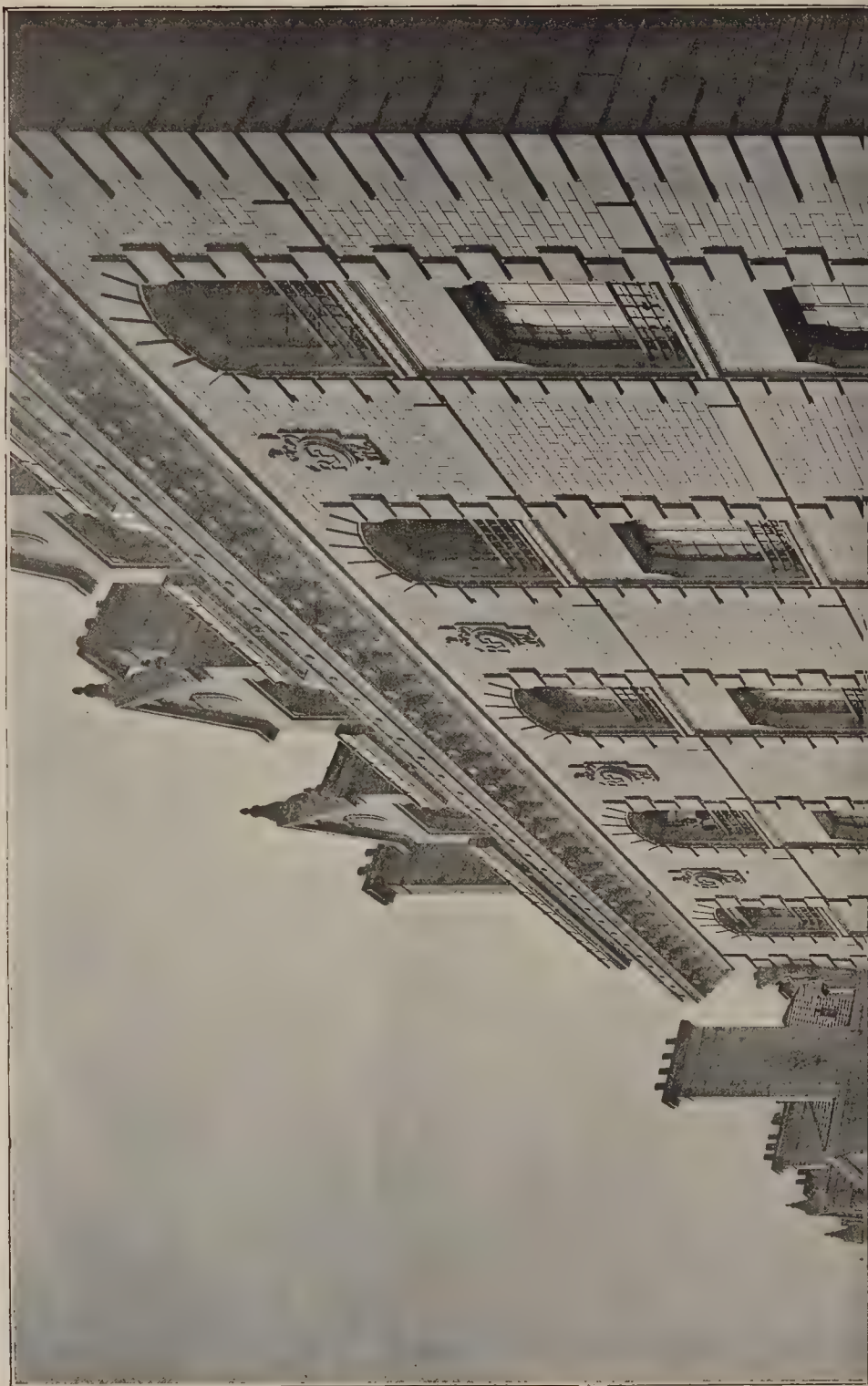








THE BUILDER, JULY 7, 1898.







NEW BARRACKS FOR THE GARDE RÉPUBLICAIN, PLACE MONGE, PARIS.

M. ACHILLE HERMANT, ARCHITECT.

The Phototype Co. 34, Strand, London





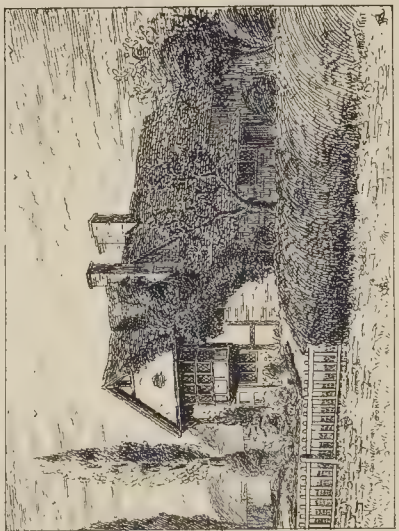
A7 WITLEY



AT WITLEY

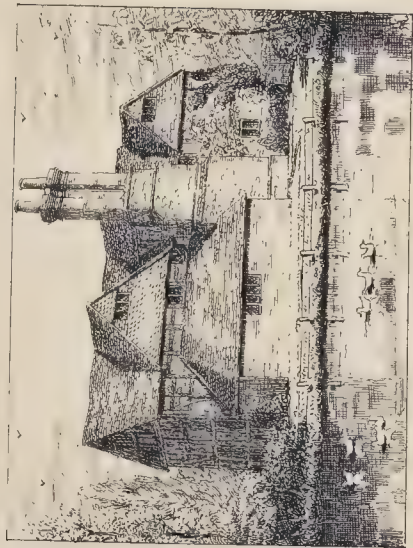


ATW TLEY



NEAR WITLEY





RAKE HOUSE



AT TEWSLEY



RAKE HOUSE



AT EASHING

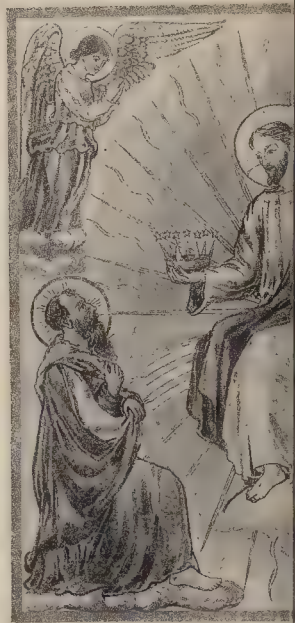
OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.

Drawn by Mr. Ralph Neville, F.S.A., Architect, 15, Abchurch Lane, London, E.C. 4.



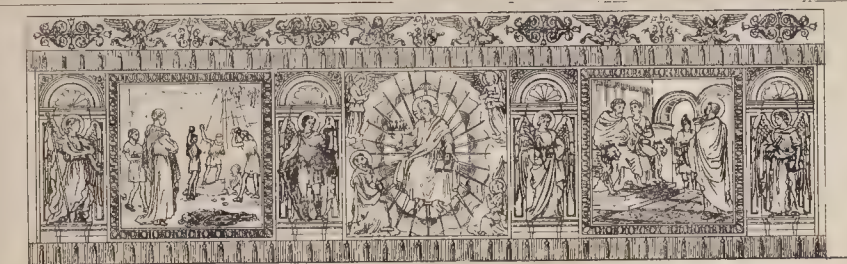


DETAIL OF SUPER-FRONTAL.

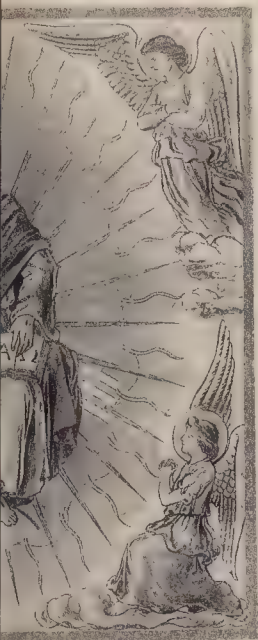


THE NEW ALTAR FRONTAL, ST. PAUL'S CATHEDRAL





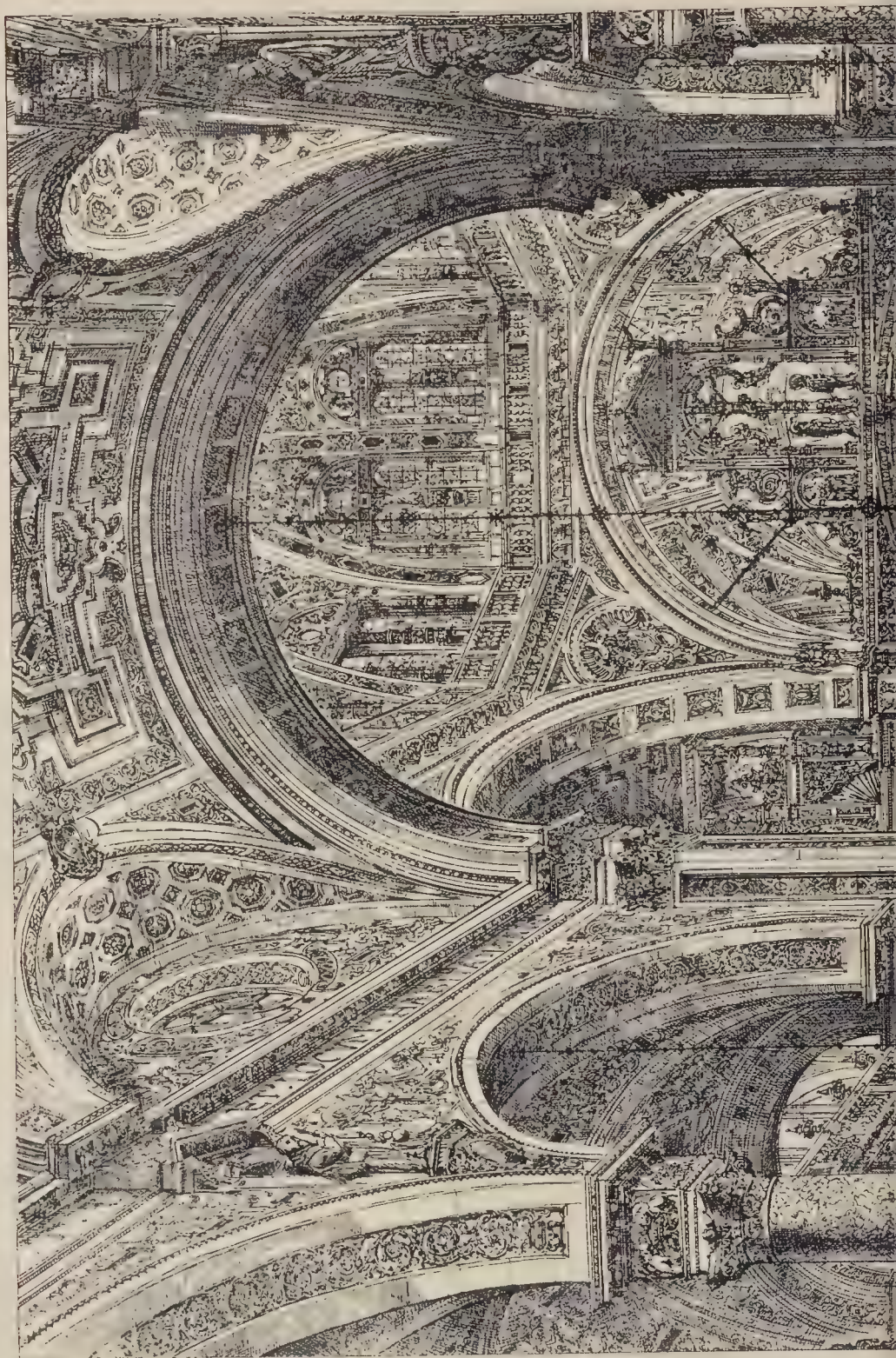
GENERAL DESIGN.



NEW PHOTOGRAPHY BY J. H. MARY & CO. LONDON, W.C.



THE BUILDER, JULY 7, 1886.













had the pleasure of restoring, or rather of repairing and preserving, the old portion, and adding a new wing at one end. As the house had previously been untouched in one possession for fifty years, it had escaped material injury. The lean-to on the pond side is an addition to the original house, and on the other side there was originally a gable in the roof corresponding to that over the lean-to. Of the plan I shall have something to say at a later date. R. N.

#### ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS: MEETING AT CARLISLE.

The annual Northern District meeting of this association was held in Carlisle on the 23rd ult., when there was a good attendance of the members.

The Mayor having welcomed the members, Mr. Joseph Gordon, Borough Surveyor of Leicester, and formerly City Surveyor in Carlisle, the President of the Association, in an opening address, referred to the interesting things they would see in Carlisle,—works which had been carried out by Mr. McKie, the City Surveyor, and Mr. Hepworth, the Gas and Water Engineer. In addition to the President the following members of the Association were present:—Mr. E. Pritchard (past president), Birmingham; Mr. H. U. McKie, Carlisle; Mr. W. G. Laws (past president), Newcastle-on-Tyne; Mr. R. S. Roundthwaite, Sunderland; Mr. G. R. Strachan, Chelsea; Mr. E. R. S. Escott, Halifax; Mr. W. Dent, Nelson; Mr. J. Cooper, Edinburgh; Mr. J. P. Spencer, Newcastle-on-Tyne; Mr. R. Pickering, Whitehaven; Mr. J. B. Wilson, Cockermouth; Mr. M. Hawden, Blaydon-on-Tyne; Mr. T. Dawson (district secretary), Benwell.

The members first proceeded to visit the new markets now in course of construction, upon which Mr. Causton offered some observations. Continuing their journey along the Castle Bank they went through the new Slaughter-houses, the City Surveyor showing them through the buildings. Under the guidance of Mr. McKie and Mr. Mackay they next visited the Police Office and cells, upon which both gentlemen made some observations to the company; and the last place visited were the Public Baths, where Mr. Hepworth acted as the guide.

This concluded the visiting programme, and the members and friends had luncheon together in the County Hotel, under the presidency of Mr. Gordon. A short toast list was gone through, the President giving the loyal toasts.

Mr. Pritchard, in proposing the "City and Trade of Carlisle," said from what they had seen that morning there was every inducement for the proper development of trade in Carlisle. The Corporation, advised by their esteemed friend, Mr. McKie (applause) had done everything in connexion with the sanitation of the city to induce men of commerce to make Carlisle their head-quarters and to lead manufacturers to settle there. In speaking of sanitation he had seen in the old-fashioned Town-hall two diagrams, dated thirty-two years ago, containing two important points in connexion with sanitation which had been the subject of patents since that date. When he found at the present moment that their system of dealing with sewers and sewer-traps was the same as that obtaining thirty-two years since, and that they had been made so much of at present as being modern inventions,—when he said that that bore the name of Mr. McKie, it said something in favour of the sanitary position of Carlisle at the present moment (applause). In sanitation they must be above suspicion in order to secure the proper development of trade, and from what he had seen and heard, and from no less authorities than Sir Robert Rawlinson and Mr. Mansergh, and judging from the reports that they had had from Carlisle, the city stood well from a sanitary point of view (applause).

The Mayor replied, expressing his pleasure at being amongst them. While they had everything they could desire to facilitate the flow of trade to the city, he was afraid that trade with them was deteriorating. But they had in the city everything to make it a residential one, (hear, hear),—most excellent gas and water, open and clean well-paved streets,—and he hoped that Mr. Pritchard's words would go forth, and that many of the people both in the north and south would see their way to take up their residence in the ancient city (applause). Their President (Mr. Gordon) was

one of the Surveyors for Carlisle when he (the Mayor) was in the Corporation twenty-two years ago, and he had no hesitation in saying a better man could not be found (hear, hear).

Then followed Mr. McKie, and they were better able to judge of the work carried out by their City Surveyor during the last fifteen or sixteen years than he was (cheers). He was sorry at the absence of Sir Robert Rawlinson, because he believed that Sir Robert had intended to be present to show his respect for Mr. McKie (applause). Sir Robert carried out the sanitary regulations of the city, and he believed that it was the third town in which he had carried out similar arrangements in conjunction with Mr. McKie.

Mr. Creighton also replied to the toast.

Mr. Laws, in a humorous speech, proposed the health of the readers of the papers which were to be delivered later on, and Mr. McKie, Mr. Hepworth, Mr. A. T. Walmisley, and Mr. Causton replied.

Mr. Pritchard then proposed the health of the Chairman, and said that during the past fifteen or sixteen years they had had no president who had worked with the same energy, who had attended meeting after meeting, and who had been so successful in increasing the number of members of the Association as Mr. Gordon (applause).

The President, in reply, returned thanks, and said that he had been anxious, notwithstanding the great distance of Carlisle from the centres of invention and the seats of industry, from which the members chiefly came, that this meeting should be fairly representative, because there was no member of the Association for whom, he believed, speaking as a body, they had a greater or higher esteem than the City Surveyor of Carlisle (applause),—and they looked upon him as one of the pioneers of sanitary engineering. Had Sir Robert Rawlinson been there he would have told them in eloquent language how very highly Mr. McKie stood in the sanitary world, in being one of his chief lieutenants in carrying out those great sanitary works in the introduction and teaching of sanitary science which prevailed throughout England (applause). Mr. Pritchard had referred to the fact that he had seen diagrams that morning dated thirty-two years ago, and he (the President) remembered seeing from Mr. McKie's own hands in his office diagrams, one showing what street gullies and what gullies for private drainage ought to be then and what they ought to be now; and the other showing the insertion of manholes. Mr. Pritchard was quite within the mark when he told them that these diagrams were not improved upon to-day. They were as good to-day as they were thirty-two years ago, and it was, therefore, with peculiar satisfaction that he was there that day as President of this increasing and influential Association in the sanitary world to say that they honoured their friend, who was one of his earliest teachers,—the City Surveyor of Carlisle (applause). He would tell the gentlemen of the Council of the city, as he had told the councillors of other Local Authorities, that it must not be forgotten that the members of the Association did not subscribe to the funds of the Association and travel at great inconvenience to attend the meetings to benefit themselves only, but to benefit the municipal and sanitary authorities of the kingdom (cheers). It was by meetings of this kind that they instructed and encouraged each other, because thirty-five years ago, when the city of Carlisle called in Sir Robert Rawlinson, who now stood at the head of the profession as a sanitary engineer, it was at that time almost necessary to call in the aid of some celebrated engineer from London. That was not necessary to-day, and that was chiefly through the instrumentality of the Association disseminating information and being ready to stand by the side of each other if any difficulty arose. Considering the sacrifices made by members, they were doing a great work, not in their own interests, but in the interests of the Local Boards and Sanitary Authorities of the kingdom and in the interests of sanitary science in the world at large. If they proceeded in this way and got presidents to throw their heart and soul into the work, as he hoped he had done, they would make themselves felt, and Sanitary Authorities and Local Boards would eventually recognise the Association as one established to carry out the great principles of improving the sanitary condition of the people of this country (applause).

The members then adjourned to the Council Chamber in the Town-hall, where the following letter was read from Sir Robert Rawlinson:—

"Lancaster Lodge,  
No. 11, Bolton, West Brompton, S.W.,  
21st June, 1888.

My dear Mr. McKie,—The Committee keeps me in London so much that I cannot be with you in Carlisle as I wished and hoped. It would have given me pleasure to have met you in the midst of your work and surrounded by friends. Please to make my respects to the members of your opening meeting, and say that we should not be ashamed to meet them in the midst of our work now upwards of thirty years old.

Borwick-upon-Tweed, Alnwick, Morpeth, Fenrith, Carlisle, Kewick, Lancaster, Ormskirk, and North Shields, with Alnwick Castle and Hawick, Lord Grey's place. You first, then the late dear, good John Lawson, and Gordon, must ever stand in the front rank of modern Sanitary Engineering. No man ever had better secondaries and assistants than I had in those whose names I have set forth, but you, dear Mr. McKie, have been my chief.—I am, yours ever truly,  
ROBERT RAWLINSON.  
To Hugh McKie, Esq., Civil Engineer, Carlisle."

The President then called upon the readers of the papers.

Mr. A. T. Walmisley read an elaborate paper on the roof of the new markets, in which he said that a length of about 197 ft. 6 in. by about 211 ft. 6 in. in width, forming an area of about 417 squares (of 100 superficial feet) was roofed over in three equal spans of 70 ft. 6 in. each. The new roofs covered an area of 6,300 square yards, exclusive of surrounding arcades, shops, and offices, which were connected with the market buildings. The total quantity of wrought iron to be used in the main roofs and fish-market was estimated at 400 tons, and of cast iron 130 tons.

Mr. Hepworth next read a paper on the "Carlisle Public Baths," which, with furnishings, cost the Corporation, 7,000l.

Mr. McKie, the City Surveyor, read papers on the new Slaughter-houses, which were erected at a total cost of 6,101l., and which he said were now paying their working expenses and the interest on the money borrowed for their construction, although they had only been opened six months; on the improvements carried out at the City Police Office and cells in 1879 at a cost of 2,620l.; an elaborate record of house junctions and street gullies on main sewers; a scientific test of Lazonby old and new quarry and other stones; and lastly, a record of municipal work in the Surveyor's department in Carlisle during the past eleven years. Among the other items in the record were the reformation and repavement of sixty-two public streets; formation and paving of 102 private streets during that period. The total length of streets reformed was nearly sixteen miles, and 150,740 square yards of new pavement had been put down. Besides the usual sewer repairs, fifty-six new sewers had been put in, and many improvements made to storm water outlets and flushing arrangements of the existing sewers. Various improvements had been effected in ventilating the sewers. In town improvements the extensive structure of the Victoria Viaduct had been completed, old rookeries in Annetwell-street and Irisgrate Brow pulled down, and the streets there widened and improved; White Hart-lane was demolished and Bank-street widened, and property in Fisher-street and Scotch-street had been acquired where the new market was being built. Upwards of 160,000l. had been expended upon purchase of property, new works, &c., but over three-fourths of that amount was covered by the Railway Companies' contribution, &c. The Corporation owned some 320 acres of grazing land in the city, as well as house and shop and other property. A number of miscellaneous works were also carried out in the period mentioned. Since 1877 the sum of 34,536l. had been borrowed for street reformation works, 6,240l. for public slaughter-houses, 10,000l. for purchase of land, 13,700l. for purchase of property in Market-place and under the Town-hall, and 30,000l. for the new markets.

The President then invited discussion upon the papers.

Mr. Escott opened the discussion by asking Mr. Walmisley, in connexion with the roof of the market, how, with reference to the spandrel girders, he was able to dispense with the seat for the girder at the top of the column. He was surprised to find such extensive work as the markets being carried out in Carlisle. They seemed enormous for the size of the town. With reference to the Slaughter-houses, he thought them very nice, but did not think there was enough width in them for carrying on the enormous slaughtering that had been mentioned.



Mr. Pritchard said he hoped that they might have in the proceedings of the Association a fair copy of Mr. Walmisley's calculation. In connection with the roof of the new market. He thought both the Baths and the Slaughter-houses were a vast convenience to the place, but he could not agree with Mr. Escott in his strictures on the latter place. Mr. McKie had, perhaps, by his mechanical arrangements, reduced the area of the plan somewhat as compared with other slaughter-houses that he had seen, but he had overcome that difficulty by his mechanical contrivances for the killing and dressing of the cattle. Both for ventilation, general, and mechanical arrangements the place appeared to be almost faultless. The drainage appeared perfect. He would like to know how the sewage of Carlisle was utilised or purified, and what screening chambers there were, and, in conclusion, said there were few cities that had such a happy state of things as regarded their sewers, house drains, connexions, and methods of ventilation as Carlisle.

Mr. Strachan gave a word of warning about the concrete floors to be used in the markets. The area was to be practically one piece of concrete, and unless special precautions were taken, the temperature and atmospheric conditions would crack it. If concrete was laid down in bays above 10 ft. square the probability was that they would crack across, whereas if the bays were smaller, say 3 ft. or 4 ft., the cracks there would be so small and come at the joints so regularly that the whole would present the appearance of being perfect. In conclusion he made a reference to Mr. McKie's tests with Lazonyb and other stones.

Mr. Laws, taking up the question of the test of stones given by Mr. McKie, said he could not understand how the Caithness flags which they got now began to split up and to shell off into shallow flats when they absorbed no water. He was aware that some Caithness stones, more especially darkly-coloured ones, never did break up, but although they were longest they were the most dangerous stones that possibly could be got. In Newcastle, as far as possible, he was discarding them in favour of Lazonyb stones, which were much safer in streets like those of Newcastle, with steep gradients. There were only three or four days in the year in which Lazonyb stones were unpleasant to walk upon, whereas throughout the year they found the Caithness ones dangerous, and in Newcastle they had had more than once to pay compensation to persons slipping upon them and breaking their legs. In conclusion he asked some questions of Mr. Walmisley as to the strains on certain parts of the roof through variations in temperature.

Mr. Spencer also asked some question having close relation to those asked in conclusion by Mr. Laws; and proceeded to bear testimony to the excellent plan of the Baths, but he would like to know, as the swimming-baths were constructed of concrete, whether, since the baths were opened, there had ever been the slightest indication of leakage. The Slaughter-houses were really a boon to the town, and he hoped that all sanitary authorities who did not already possess the powers in private Acts would take the first opportunity of obtaining such powers to make compulsory the use of slaughter-houses (hear, hear), because he was afraid that many authorities burdened the ratepayers with great expense by putting up excellent slaughter-houses and failed to induce those to use them for whom they were intended.

Mr. Roundthwaite was not struck with the crampedness of the killing-houses at the slaughter-houses mentioned by a former speaker. He thought they appeared to be ample. He had seen Glasgow, Edinburgh, Bradford, Leeds, and Manchester slaughter-houses, and he did not think any of these places could show a better range of buildings for their size, more compact or more cleanly, than those of Carlisle. He would like to know whether the automatic flushing chambers mentioned were really automatic, because he had not found them so; whether any of the butchers in the city objected to go to the slaughter-houses; whether they were compelled to go there; and whether the Authority had licensed any private slaughter-houses in the city?

Mr. Creighton said that after making many inquiries about Mr. Walmisley they had adopted his roof for the market, for they heard that he really was a competent man (applause). With regard to the Baths, he believed that any town who wanted baths could not do better than

adopt the plan of Carlisle. The concrete work was going on all right, and the baths were so constructed that one could walk round them in the galleries underneath, and if anything went wrong they could easily be put right. He did not agree with the gentleman who criticised the killing-rooms at the slaughter-houses, and, with reference to the flags to be used in towns, his experience and the experience of Carlisle was that there was no flag in the world like Lazonyb. It was rather an invidious thing to say, but on coming into town by train on damp mornings he found water standing a quarter of an inch deep on Caithness flags, but when he got on to Carlisle streets he found them dry. They in Carlisle were very much obliged to the Association for visiting them, and were proud to see Mr. Gordon, who was an old citizen.

The President, in closing the discussion, said he did not remember a single meeting at which the papers read deserved greater attention, because they were teeming with information. They believed that by this information and discussion they were doing a great good. Reviewing the papers and discussion, he said he thought it was an unusual thing for them to have an opportunity of criticising works in the state in which they found them in Carlisle, because, supposing that the criticisms upon the huge roof of the new market, which was a most important one, had been of a very adverse character, it would have raised the question in the minds of the Corporation as to whether they were properly advised. He was sure that members of the Association would always exercise a wise discretion in criticising works of which they only had a slight knowledge from a day's visit as set against the views of the responsible officers of any Corporation advising on such matters. He paid a high compliment to Mr. Walmisley's skill as an engineer, and said he believed the engineers had been well advised in consulting him on such an important subject. He asked Mr. Hepworth if he had any plans from which the Baths were built to allow these to be published in the proceedings of the Association along with his paper. He was struck with the fact that the baths were constructed of concrete, and that the wall of the baths were only 2 ft. thick, and absolutely water-tight. He was certain this could not be the case if it were not for the lining with the white tiles. He was exceedingly pleased with the Slaughter-houses, which were excellent examples of their kind. Mr. McKie's paper on the municipal work gave very interesting details as showing what had been accomplished by an enterprising Corporation, and was a credit to the Council and city of Carlisle, and something that one could scarcely expect to find in a town of its size. To the Councillors of the city he said, "Do not think you have got the market too large. Do not grudge the expense upon them, for you may depend upon it you are riding on the right side, and in twenty years hence you will not regret it" (applause). There would be very few markets in the North of England to compare with it. While pointing out that Mr. McKie's test with stones was conducted thirty years ago, yet he confessed that the best test for stones was the wear and tear of ordinary traffic (hear, hear). One point touched upon by Mr. McKie was the ventilation of the sewers. Open gratings were very much objected to in many towns, being complained of as a nuisance, and Mr. McKie was in the right direction when he got the owners of high chimneys to allow the ventilation to pass through them. In Carlisle, in 1855, he believed, they were the first to start that method. It was, therefore, of the greatest possible interest to know what was the result in Carlisle in following up this system, and he hoped Mr. McKie would communicate that to the Association. Another point of interest would be if Mr. McKie would say what has been done with regard to the utilisation of the sewage since the sewers were laid down.

Mr. Walmisley replied upon the discussion, so far as it affected his paper, and gave permission to publish the details of his calculations for the roof of the market if the Association thought fit. From the plans in the Chamber he gave the members the information asked for. As regarded the concrete floor, he explained that he was not responsible for that. With regard to the spandrel girders, all that he had to do was to provide sufficient bearing area to take the reaction of the girder. As long as the columns remained in position, there was no fear of the girders slipping.

Mr. McKie, in replying to the criticisms on his paper, said the killing-houses were wide enough for the slaughtering he had mentioned in his paper,—168 beasts and 700 sheep in a day. With reference to his tests of stones, he said regarding the Caithness flag it depended where they got them. If they got top rock or inferior rock it would laminate off, but in Carlisle they had had some down for more than twenty-two years, and there were very few of them that had gone down. The skin of a Lazonyb flag was not thicker than his finger-nail, and the skin had been found to resist for sixty years in Carlisle. It was very difficult to get flags from Lazonyb as they used to get them thirty years ago. Whole mountains had been rooted out, and they now got a secondary flag. The automatic flushing-chambers he had found to go on very well, but they required to be attended to once a week. Flushing the sewers he thought to be a very important thing, and he kept a man doing nothing else. He abominated traps; they must be carefully put in and carefully attended to.

Mr. Hepworth then replied upon the discussion on his paper, and said, with respect to the porosity of concrete, that when he wanted to make a tank tight he had generally succeeded.

In the baths there were one or two traces of water leakages, but so small that they would not lessen the water in the tanks of the swimming baths half an inch per week. He attributed these leakages to the cracking of the concrete at particular places.

A vote of thanks was accorded the readers of the papers, and also to the Mayor for the use of the Council Chamber, and the proceedings terminated.

The annual meeting of the Association is to be held in London on Thursday, Friday, and Saturday next, the 12th, 13th, and 14th July, at the Institution of Civil Engineers, 25, Great George-street, Westminster (by kind permission). The following is the programme:—

Thursday, 12th July.—12 (noon), General Meeting: annual Report; General Business, &c.; Address by the President (Mr. E. B. Ellice Clark). 1.30 p.m., Adjournment for Luncheon. 2.30 p.m., Papers and Discussions: "Back Streets, Lanes, and Alleys," by Mr. H. U. McKie, Carlisle; "Average Meter System," by Mr. G. E. Strachan, Chelsea; "Ten Years' Experience of the Shono System," by Lt.-Col. Jones, V.C., Wrexham. 4.30 p.m., Adjournment to view the drainage works at the Houses of Parliament. 7 for 7.30 p.m., Annual Dinner at the Criterion Restaurant, Piccadilly.

Friday, 13th July.—9.15 a.m., Déjeuner at the Hôtel Métropole (by invitation); after which visit Messrs. Jennings's Works at Stangate, Lambeth. 11.30 a.m., Institution of Civil Engineers: Discussion on Lt.-Col. Jones's Paper; also the following Papers and Discussions thereon: "Electric Fire Alarms," by Mr. T. De C. Meade, Hove; "Water Supply," by Mr. W. Santo Crimp, Wimbledon; and "The Purification of Sewage by Electricity: Notes and Experiments," by Mr. W. Webster, F.C.S. 2 p.m., Adjournment; Luncheon at the Hôtel Windsor, Victoria-street, Westminster (by invitation), after which visits will be paid to The Lucigen Light Works (Page-street, Westminster), and Brier's Oxygen Works, Westminster, where at 4 p.m. carriages will attend to convey the party to visit the New Battersea Bridge Works.

Saturday, 14th July.—11 a.m., Members will embark on board the *Cupid*, or other steamer (kindly provided by the President, Mr. E. B. Ellice-Clark), at the Temple Pier, and proceed down the river, inspecting the Tower Bridge; the Greenwich Ferry (Mr. J. Standfield, M.Inst.C.E.), will receive the party and explain the works here; and the New Outfall Works at Barking, where Sir Joseph Bazalgette, C.B., will receive the members and explain the Works, and where Messrs. Mowlem & Co., the Contractors for the Works, invite the members to luncheon. Leave Barking at 4 p.m., arriving at the Temple Pier at 5 p.m.

**Technical Education for Blacksmiths.** The Blacksmiths' Company will shortly hold an exhibition of work exemplifying the trade of a blacksmith. Prizes will be offered, and competition is invited amongst journeymen and apprentices. Further information may be obtained of Mr. W. B. Garrett, C.C., clerk to the company, 16, Water-lane.—*City Press*.



## ARCHAEOLOGICAL SOCIETIES.

*British Archaeological Association.*—The annual meeting of this association will commence at Glasgow, under the presidency of the Marquis of Bute, on the 27th of August. There is a strong local committee of reception, over a hundred in number, of which the Sheriff of Lanarkshire is chairman, and the Hon. Sir James King, LL.D., Lord Provost of Glasgow, is vice-chairman. Visits will be paid to the Cathedral, the Bishop's Castle, and the Hunterian Museum, Glasgow; also to Bannockburn, Stirling, Rothesay Castle and Bute, Linnthgow Palace, Dunblane Cathedral, Paisley Abbey, Bothwell Castle, Lanark, and many other places of antiquarian interest.

*Royal Archaeological Institute of Great Britain and Ireland.*—The annual congress of this institute will have its headquarters at Leamington, where the opening meeting will be held on Tuesday, August 7th.

## ENGINEERS' CLAIMS FOR PROFESSIONAL SERVICES.

DENTON v. THE HENDON RURAL SANITARY AUTHORITY.

In the Westminster County Court, last week, the case of *Denton v. The Hendon Rural Sanitary Authority*, which was an action for the recovery of certain professional charges in respect of getting ready and giving evidence at a Local Government Board inquiry at Hendon, was tried by his Honour Judge Bayley. The claim was for 14*l.* 14*s.* Mr. Rawlinson was counsel for the plaintiffs, and Mr. Hargreaves for the defendants.

From the evidence of Mr. Bailey Denton, it appeared that in the early part of 1887 Mr. Soames, the solicitor for the defendants, called upon his firm and arranged that he should give evidence in respect to the scheme which their engineer had prepared for the drainage of Edgware and Stanmore. He told Mr. Soames that his charges would be 20*l.* for the report, and 10*l.* 10*s.* for each day's evidence, and 2*l.* 2*s.* a day for attending counsel. He did the work required of him, but, unfortunately for the defendants, the Local Government Board decided against the scheme. He had received a cheque for 21*l.* That left a balance due to him of 14*l.* 14*s.* Cross-examined, he said that no mention was made to him that the bill would be taxed.

Mr. Hargreaves, for the defence, submitted in the first place that notice of this action had not been given under the 26th Section of the Public Health Act, and also that the action should have been commenced within six months of the debt becoming due.

His Honour decided against the defendants on both points.

Mr. Hargreaves said that the inquiry, which was an abortive one, cost about 400*l.* for professional witnesses, and they had paid the plaintiffs all they were entitled to. That was all the taxing-master had allowed. Mr. Soames understood that 21*l.* was to be all the plaintiffs were entitled to.

Counsel's statement was borne out by Mr. Soames. His Honour in the end gave a verdict for the plaintiff for the amount claimed, with costs, and refused to stay execution.

There was also a case in which Messrs. Law & Chatterton were the plaintiffs, and they claimed 15*l.* 15*s.*, the balance of professional fees in respect to the same matter, and judgment was given for them with costs, and stay of execution refused.

## SWINDON LOCAL BOARD COMPETITION.

SIR,—We should be glad to have any information as to the "Swindon Local Board Competition." We saw that Professor Roger Smith had been appointed assessor, but up to now have seen nothing as to the result.

We may, however, mention, that we have heard from very good authority at Swindon that the designs have been reduced to three, one of which is by a local architect. NEWMAN & NEWMAN.

## LINOLEUM ON FLOORS.

SIR,—In reference to the letter of "T. J." in the *Builder* of the 23rd ult. [p. 453], and the reply of Mr. Wm. Lund, 30th ult. [p. 47], our experience is, that if the timber and flooring be free from incipient decay, no linoleum or oil-cloth may with safety be covered all over the floor, provided the space underneath be free from damp and the ventilation thereof be thorough (and *through*). We were asked to advise in a case in which a new basement wood-floor became so utterly rotten within twelve months that the boards gave way under foot when it was being laid; it was entirely covered with linoleum, which, being supplied, removed the cause of the decay. A new floor was laid some ten years since and covered with linoleum, and so remains to this day.

In another case, extensive basement floors were covered with oil-cloth, and have remained for many years without any evidence of rot, but the surface under is covered with Portland cement concrete, trowelled smooth on top, which prevents damp rising from the earth (asphalt over concrete would be better). The basement extends only to the back part of the premises. To provide efficient ventilation, a sufficient number of air bricks have been placed in the back wall, and to satisfy the condition of *through* ventilation, there are no continuous sleeper walls, but sleeper piers only. Earthenware pipes are carried up to communicate the lower space under the basement floor with the higher space under the ground-floor of the front portion of the premises, which also has a sufficient number of air-bricks in the front wall, so that air can pass through from back to front, and *vice versa*. Adjoining this portion of the premises was a wooden stair, to which the alterations did not extend; the basement landing of the stair had a space under which was not covered with concrete (but was not particularly damp), and was enclosed in and out off from the ventilated portion of the floor. The woodwork of this, rotted within two years, was reinstated, and fitted with two small brass gratings projecting the thickness above the surface, so as to be flush with the oilcloth, and has remained for seven years without giving further trouble.

In another case, all the floors in the house, except those of the basement, are covered with oilcloth, to satisfy a whim of the owner and occupier, loose carpets being laid over. This has been so without ill effect for over twenty years. There is no special ventilation between ceilings and floors of the upper stories, but the spaces being thoroughly dry the ventilation becomes of less importance, and it is possible that the new lime plaster of ceilings is pervious enough and sufficiently absorbent to maintain the enclosed air in a proper hygrometric condition.

In a new building the ventilation of the space under the floor which next to the ground may be much assisted by carrying up a separate ventilating flue therefrom in the chimney-stack.

Care should be taken to exclude damp from external basement walls. A. & C. HARSTON.  
15, Leadenhall-street, E.C.

SIR,—Your correspondent, "T. J." [p. 453 of the *Builder* for June 23], has brought to notice, with regard to linoleum, oil-cloth, and all these impervious floor-coverings, the fact of rotten, or partially rotten floors, frequently following their adoption. It is, no doubt, due to a variety of causes, but in all of them imprisoned damp is the prime mover. Often floors are scrubbed after house decoration is completed, and the floor-covering, of whatever sort, hurriedly put down before the floor has a chance to dry properly. A second reason is most probably the chief one, viz., the "sweating" of the under side of the material in damp weather. This points to the need of manufacturers altering the style of their productions, so as to make them of a honeycomb pattern, or approaching the style of cocoa matting or open-work carpeting, as the present style of make in all these materials I have mentioned, with other similar, is very prejudicial to wood flooring.

Trusting these remarks may lead to practical improvements, DECORATOR.

## The Student's Column.

## ARTIFICIAL STONE.—I.

HAVING in a previous series of articles gone pretty fully into the structure and characteristics of natural stones, we have thought that a detailed investigation of the methods that have been employed in producing Artificial Stone, and the nature and value of the various products of this kind, may be a useful and appropriate supplement to the subject of Building Stones.

The production of artificial stone has long been the object of strenuous effort and unremitting experiment on the part of a large number of inventors, and there can be little doubt that in some instances encouraging success has crowned their efforts. Like the natural material which they strive to imitate, artificially-formed stone may be of all qualities, from very bad to effective and good. Whether a good stone formed artificially, and which is equal in strength, hardness, workability, resistance to chemical action, &c., to the kindred natural product, will withstand the action of time as well or better than the latter, time alone can prove. There can be in many instances no chemical reasons for doubting that such stone will resist its influence as well as the most resistant rocks formed in Nature's laboratory; yet, on the other hand, it is well known that the quickly-formed products of the manufacturer and experimentalist, although they may in chemical composition, outward appearance, and in other physical characters equal or even excel some similar but naturally

formed product, will after lapse of time exhibit weak points or defects which are not observable in the latter, which has been, as a rule, more deliberately formed, and has been allowed countless ages in which its constituents may become completely united, its molecules arranged in natural and stable positions, and its characteristic properties developed. We propose in this article to indicate what has been done in this department of building economy, and although many of the methods which will be mentioned are of little general utility, they may be useful in pointing the moral, that it is eminently desirable that persons experimenting in this direction should, at any rate, possess a rudimentary knowledge of chemistry, as well as a practical acquaintance with the nature of cements and building stones, and their behaviour under various circumstances.

To summarise this important subject, the examination of the specifications of more than three hundred patents from the year 1724 to the present time has been necessary, as well as careful reference to the technical literature of the subject, so that the labour entailed has been considerable, and it may be possible that some points of importance have been overlooked. It is hoped, however, that this attempt to bring together the recorded results of the labours of many practical and some impractical men, may be of service and of interest to all working at this problem.

A leading member of the present Government gave expression not long since to the opinion that grammar was an unimportant matter in an Act of Parliament, or, in other words, that any English is good enough for such a document. The same opinion seems to possess the minds of patent agents and patentees as regards their specifications, to judge from the atrocious rignmarole that is used in many of them to set forth the nature of the invention and the claims of the patentee.

In order to enable the mass of matter before us to be dealt with the more systematically we propose to divide the subject into twelve sections or classes as follows:—

1. Vitrified or glassy stone.
  2. Semi-vitrified stone.
  3. Articles and surfaces composed of plaster of Paris, which have been hardened or treated in order to produce the appearance and effect of a more durable stone.
  4. Compounds containing organic matter as a prominent ingredient.
  5. Concretes or compounds in which lime, hydraulic cement, sand and pebble, or broken stone are the chief ingredients.
  6. Stones which utilise some residual by-product or waste material from manufacturing, mining, or quarrying operations.
  7. Stones in which silicates are used as the cementing material.
  8. Asphaltic and tar containing stones.
  9. Treatment of natural stone previously cut to the desired form so as to produce an appearance resembling some more ornamental, costly, or durable stone.
  10. Methods of hardening or accelerating the induration of artificial stone mixtures by exposure to carbonic acid and other gases.
  11. Special devices, mechanical in their nature, for more rapidly and completely hardening the artificial stone or for building together structures formed therefrom.
  12. Stones not included in the above classes, in which one ingredient, such as sulphur, asbestos, magnesium compounds, &c., is the prevailing feature.
- This classification is not proposed as an absolutely satisfactory one, but is merely adopted as already said, to enable us to deal with the subject in a more systematic manner. In some cases the stone might be included in more than one of the above divisions, and where that is so it is placed in the division that its main characteristics seem to favour most.

**Model By-Laws for Sheffield.**—A proposal for the adoption of new by-laws has been for some time under the consideration of the Sheffield Corporation, but the elaborate code prepared by the Highway Committee has collapsed. The last meeting of the Town Council decided that many of the proposed new by-laws were not adapted for use in Sheffield, and the scheme was dropped. Some of them had been protested against by the Council of the Sheffield Society of Architects and Surveyors.



## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

3,950, Domestic Fireplaces. J. Inshaw.

According to this invention, an iron baffled-plate works on centres in an iron frame supported on the back part of the brickwork, on which the plate, when let down to an angle of 45°, rests. This plate prevents the heat going at once up the fire, and reflects it to the front. The plate, however, in the event of the fire being required to burn up rapidly, can be drawn forward and used as a blower. The shape of the plate and its position is determined by the shape of the grate.

10,042, Roofing Material. A. Boul.

According to this invention, the squares or flags composing the paving (pavé) of the roof consist of a mixture of hydraulic or Portland cement and sand, covered on the outside with a mixture of hydraulic lime. The whole is slightly damped and submitted to hydraulic pressure in special moulds. Some three days after moulding the squares are immersed in water for a few hours for the perfect union of the component parts. The squares form a butt-joint on one side and a lap-joint on the other. The frame of the roof consists entirely of double-channel or H-section irons, on which are placed angle-irons with the angle downwards resting in suitable chairs. The squares or flags are placed on these angle-irons, the irons being laid down at such distances that the butt-joints of the squares are immediately above them, and they thus form gutters for any water which might filter through the joints.

10,132, Spiral Tubes, Chimney-pots, Terra-Cotta Mouldings, &c. H. L. Doulton and M. Marshall.

According to this specification, tubes or rods of any cross-section, and in spiral form, are made by expressing plastic clay-earth through a spirally-formed die of the cross-section and pitch required. Some articles may be made with the central portion of a spiral form, and with a head and foot separately moulded, and caused to adhere to them before burning, and by applying figures or ornament in this way, undercut work can readily be produced which otherwise could only be made at considerable expense. For chemical manufacturers, evaporation or condensation tubes, or rods of pottery-ware may be made by this method, obtaining increased condensing area in the same cubic space.

10,361, Ventilation of Sewers. J. Phillips.

This invention, in a long specification, describes the means of accomplishing the purposes of this invention, which are (1) to divide the sewers into separate sections so as to prevent the air currents in them from travelling to the adjoining sections; (2) to take copious streams of fresh air from the streets down the manhole shafts into the separate sections at their lower ends; and (3) to discharge the air currents in the separate sections from their upper ends into the atmosphere above the houses. A system of apophons, traps, and ventilating covers are fitted with this view.

10,376, Stove Grates. C. H. Perrot, A. Habershorn, and J. C. Richmond.

According to this invention, the interior portion of the grate, that containing the fire, can be drawn forward or pushed backwards as desired, or removed altogether from the grate. The lower edges of the sides of the interior or back metal slide across the fixed back strap of the piece of metal that connects together the legs of the stove front. To prevent the interior from being drawn too far forward, lugs are fitted projecting from the back, but which, on slightly raising the interior, allow of the grate being removed from the remainder of the stove.

5,339, Apparatus for Lifting Doors. C. Bradbury.

To lift up doors in order to give access to the hinges for lubrication and such like purposes, the inventor uses a bent lever, to one arm of which the hand can be applied, the other arm of which has a roller mounted on a pin, and a blade is also affixed. The blade being passed under the door, the handle being upright, it is then pulled down the leverage lifting the door for any desired purpose.

5,975, Heat Radiating Mantel. E. Berliner.

The mantel which is the subject of this invention, while being to all appearances similar to ordinary mantels, and ornamented and embellished in any desired way, has a hollow space above and on each side of the grate; and the entire face or front wall of this hollow space is of metal, and constitutes a heat-radiating surface of large area.

## NEW APPLICATIONS FOR PATENTS.

June 22.—9,133, F. Gibbons, Fan-light Openers.

June 23.—9,163, T. Twyford, Window-closers.

9,176, C. Duplany, Fireproof Curtains for Theatres and other Buildings.

June 25.—9,217, E. Eite and H. Gooch, Fasteners for Doors, Door and Window-Shafts.—9,234, J. Cartland, Bolts for Doors, &c.

\* These arrangements were fully described and illustrated by the inventor in the *Builder* for April 28 last, pp. 296, 297.

June 26.—9,273, C. Bennett, Laying and Fastening Wooden Flooring.—9,274, B. Lane, Window-shafts.—9,288, H. Lyons, Polishing or Enamelling Wood, Cement, &c.—9,301, W. J. Van der, and others, Window or Ventilator Movements.—9,317, R. Stephens, Fastenings for Casement Windows, &c.—9,343, F. Hodges, Mitreing Bench and Vice.—June 27.—9,360, J. & W. Cormack, Ventilators, &c.—9,388, A. Ramsden, Sewer, and other Pipe Joints.—9,400, G. Ulling, Waxing Floors.—June 28.—9,409, J. Saunders, Sash Fasteners.—9,442, M. Lausdell, Set-squares, T-squares, &c.—9,460, C. Kinslow, Adjustable Mulet Gauge, for Carpenters and Joiners.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

7,127, J. Wolloms, Window Fastenings.—7,502, A. Oakden and W. Sharpe, Paint Burning off Stoves.—7,664, H. Pearson, Fireproof Floors.—7,820, T. Shelley, Glazing Roofs, Sides, &c., of Railway Stations, Conservatories, &c.—8,007, J. Dichmont, Combined Sliding Sash and French Windows.—8,270, C. Ellis, Ventilators.—8,303, J. Mulligan, Chimney or Ventilating Caps.—8,313, P. Walker, Ventilating Rooms and Buildings.—8,361, J. Craig, Flush-out Water-closet Basins.—8,472, E. Whibley, Guide Fence to Band-saw Machines, &c.—8,562, J. Osgerby and J. Lea, Chimney Tops.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

8,917, T. Truss, Cows for Chimneys and Ventilating Shafts.—10,511, W. Speckman, Automatic Flushing Apparatus for Water-closets.—10,530, J. James and F. Ransome, Furnaces for Burning Hydraulic Lime, Cement, &c.—10,550, J. Rickard, Tip Wagons and Carts.—11,508, R. Harrison, Opening, Closing, and Adjusting Fanlights, Sashes, &c.—11,624, J. Hanna and T. Shillington, Stoves.—7,734, L. Bulbington, Construction of Iron Buildings.—7,751, H. Breuer and Others, Window Sill.—7,774, J. Dunn, Stays for Casements, Fanlights, &c.—7,792, A. Ford, Sliding Doors.—7,865, L. Bommer, Spring Hinges.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

## JUNE 25.

By CHIMNOCK, GALSORTHY, & CO.  
Leicester-square—4, Lisle-street, freehold ..... £1,000  
5, Lisle-street, and 29, Wardour-street, freehold ..... 6,070  
6 and 7, Lisle-street, freehold ..... 4,310  
Putney—18, Charlwood road, 62 years, ground-rent £5. 6s. .... 200  
High-street—18, Charlwood road, 62 years, ground-rent £25 ..... 200  
By FULLER & FULLER.  
Kensal Green—51, Ravensworth-road, freehold ..... 290  
Harrow—1, Fortune Villa, 78 years, ground-rent £5 ..... 240  
By WILLIAMS & CHALTON.  
Stroud Green—25, Ennis-road, 79 years, ground-rent £6. 10s. .... 240  
By C. B. CAUSE.  
Hammersmith—211, Goldhawk-road, 55 years, ground-rent £4 ..... 555  
By GAZEN & SON (of Hammersmith).  
Notting-hill—22, Crescent-road, freehold ..... 290  
13 and 15, Charles-street, 52 years, ground-rent £8 ..... 400  
11 to 6, Phoenix-place, and a range of stabling, 55 years, ground-rent £22 ..... 1,050  
Paddington—1, Hyde Park-square-lane, 47 years, ground-rent £3 ..... 300  
Pertham Rye—76, Maxted-road, 57 years, ground-rent £5 ..... 150  
By THOMAS PATEN MITCHELL.  
Eaton Secen, Beds. The Eaton Secen Brewery and plant, freehold, and twenty trading houses ..... 6,000

## JUNE 26.

By DAY & SON.  
Maidstone, near—Freehold fruit land, 9a. 2r. 20p. .... 1,250  
Little Ivy Mill, and 1a. 1r. 3p., freehold ..... 2,300  
Six freehold cottages ..... 720  
Freehold enclosures of land, 51a. 0r. 3p. .... 3,000  
Two freehold cottages ..... 300

## By A. &amp; A. FIELD.

East India-road—7, Pigot-street, 48 years, ground-rent £4 ..... 330  
City—9, Mansell-street, freehold ..... 1,210

## By BAXTER, PAYNE, &amp; LEPPEL.

Kent, Birchwood, Fruit land, 21a. 3r. 1p., freehold ..... 2,750  
Two freehold cottages and fruit land, 6 acres ..... 1,110  
Sidcup—9 to 15, Crayfield-terrace, freehold ..... 1,250  
1 to 6, Nash Cottages, freehold ..... 750  
Eltham—1 to 6, Well Hall Villas, freehold ..... 1,260  
116 to 118, High-street, freehold ..... 1,130  
1, 2, and 3, Park View Cottages, freehold ..... 620  
St. Mary Cray—1 to 4, Shaftesbury-terrace, freehold ..... 2,280  
Two freehold houses in High-street ..... 525  
Anglemore-road—Four freehold cottages ..... 815  
1 to 6, Myrtle Cottages, freehold ..... 1,070  
Derry Downs—Two villa residences, freehold ..... 740  
St. Paul's Cray—Holly Lodge, 72 years, ground-rent £7. 10s. .... 290  
Foot's Cray—Ground-rent of £27, reversion in 38 years ..... 600  
Ingle's Cottages, long leasehold, no ground-rent ..... 550  
Catford—8, Rutland Park, freehold ..... 350

## By E. &amp; H. LUMLEY.

Hornsey Improved ground-rents of 41. 5s., term 62 years ..... 700  
Improved ground-rents of 412. 8s., term 32 years ..... 2,140  
St. Paul's Churchyard—Improved ground-rent of £231. 18s. 8d., term 64 years ..... 4,900

By DEBENHAM, TAWSON, & CO.  
Essex, part of the Bower Hall Estate—An enclosure of freehold land, 6a. 2r. 25p. .... £200  
Thirteen freehold cottages, and 1a. 1r. 3p. .... 400  
Enclosures of freehold land, 20a. 1r. 31p. .... 520

## JUNE 27.

By COLLETT & COLLETT.  
Notting Hill—78, Ludbrook-grove-road, 75 years, ground-rent £12 ..... 380

By DENE & SOMAN.  
St. George's-in-East—1 to 33 odd, Everard-street, freehold ..... 1,270

By HOBSON, RICHARDS, & CO.  
Epsom, Alexandra-road—Down's View, freehold ..... 1,050  
£25. 4s., and equity of redemption of three adjoining unfinished houses ..... 200

By MADDOX & SON.  
Pentonville—4, Penton-street, 30 years, ground-rent £35 ..... 180

By C. C. & T. MOORE.  
Mile End 130 and 132, Grafton-street, 41 years, ground-rent £5. 18s. .... 620

Islington—1 to 4, Acklam-road, 38 years, ground-rent £5. 11s. 3d. .... 165

Stepney—77, 85, and 97, Grosvenor-street, 84 years, ground-rent £7 ..... 125

Haslemey—8s, Eleanor-road, 60 years, ground-rent £5 ..... 250

By JOHNA BAKER & SON.  
Clapham Junction—45, Maysville-road, 60 years, ground-rent £10 ..... 150

151 to 157 odd, and 179, Maysville-road, 60 years, ground-rent £25 ..... 920

Braynsford-square—54, Shouddham-street, 17 years, ground-rent £15 ..... 280

Haverstock-hill 1, Lower Lawn-road, 62 years, ground-rent £10 ..... 260

By MANN & BOWMAN.  
Sheerness—65, 70, 72, High-street; and a plot of land, long leasehold ground-rent £12. 16s. .... 1,520

Chelsea—8, Halsey-street, freehold ..... 1,030

Kennington, A. on Villiers Road—Ground-rent of £10. 10s. for 63 years ..... 260

Gloucester-road—Ground-rent of £14, reversion in 82 years ..... 1,380

8 and 10, Emma-street, freehold ..... 1,380

Chelsea—4, Godfrey-street, 18 years, ground-rent £5 ..... 140

1, Arthur-street, 20 years, ground-rent £2. 3s. 7d. .... 150

## JUNE 28.

By T. B. WESTACOTT.  
Kensal Town—Ground-rents of £26, term 73 years  
Fitzroy-square—19, Clifton-street, 27 years, ground-rent £2 ..... 505

By PHILLIPS, LEA, & DAVIES.  
Lower Clapton—40, Colledge-avenue, freehold ..... 390

By OAKLEY, FISHER, & CO.  
Horton—32, Alma-street, 46 years, ground-rent £5. 31s ..... 315

By S. BETTS.  
Kingsland—3, Upton-road, 30 years, ground-rent £2. 10s. .... 235

Horton—80, Prevost-street, 15 years, ground-rent £3. 10s. .... 80

Dalston—39 and 31, Livermore-road, 61 years, ground-rent £4 ..... 460

By MARLER & BENNETT.  
Bayswater—15, Craven-hill, 40 years, ground-rent £33 ..... 1,500

By NEWSON & HANDLING.  
Hornsey—131, Marlborough-road, 66 years, ground-rent £4 ..... 300

Islington—325 and 328, Liverpool-road, 47 years, ground-rent £13 ..... 1,155

Barnesbury—13 and 19, Deamark-street, 30 years, ground-rent £12 ..... 565

Finsbury Park—104 and 106, Blackstock-road, 48 years, ground-rent £1 ..... 380

108 and 110, Blackstock-road, 55 years, ground-rent £6 ..... 370

Profit-rent of 26 years term 41 years ..... 700

6, 8, and 10, Monsell-street, 56 years, ground-rent £6 ..... 350

32, Monsell-street, 50 years, ground-rent £2 ..... 175

22 to 24 even, Myrtle-street, 60 years, ground-rent £10 ..... 700

By C. C. & T. MOORE.  
Bermundsey—Improved ground-rents of £18. 10s., term 39 years ..... 475

Stratford—Improved ground-rent of £3. 10s., term 74 years ..... 40

Croydon—174, 17 to 20, Devonshire-road, 78 years, ground-rent £2 ..... 255

Chesham, Church-lane—Castle Villa, freehold ..... 475

Enfield, Ridgway-road—A plot of freehold land ..... 395

Welsby, High-street—The foot, copyhold ..... 400

Freehold house, shop, and stabling ..... 680

By R. STIMSON.  
Bermundsey—235, Abbey-street, and 108 and 109, George-row, 49 years, ground-rent £3. 17s. .... 500

Camberwell, Denmark-street—Circenester Villa, 67 years, ground-rent £8 ..... 340

Paddington—An improved rental of £50, term 60 years ..... 525

Haverstock-hill—25, Martland Park Villas, 52 years, ground-rent £9. 10s. .... 470

Clapham—Ground-rents of £40. 6s. 6d., term 70 years ..... 1,000

Stockwell—1, Deyell-road, 76 years, ground-rent £2. 8s. .... 305

By MOSS & JAMESON.  
City 5, Grocers' Hall-lane—70 years, ground-rent £11 ..... 1,750

Backenham, Cedar-road—Vere Lane, 62 years, ground-rent £10 ..... 390

Broadstairs—A plot of freehold land, 9a. 0r. 29p. .... 525

Two cottages, and 6a. 1r. 23p. .... 650

By HUMPHREY, SON, & FLINT.  
Orpington—A freehold plot of garden land, 1a. 1r. 25p. .... 160

A freehold plot of land ..... 270

Launceston, Addison Lodge, freehold ..... 2,075

Three freehold cottages ..... 200

Freehold enclosure of land, 2a. 1r. 24p. .... 525

A freehold plot of land, 1a. 2r. 35p. .... 325



JUNE 29.

By G. A. &amp; S. W.

|                                                                                                  |       |
|--------------------------------------------------------------------------------------------------|-------|
| Mile End—15 and 18, Smith-street, 25 years, ground-rent £5.....                                  | 2,900 |
| 88 and 89, Devonshire-street, freehold.....                                                      | 790   |
| 158, Jamaica-street, 25 years, ground-rent £4.....                                               | 210   |
| By G. A. WATKINSON.                                                                              |       |
| Wandsworth-road 11 to 21 odd, Newby-street, 64 years, ground-rent £24.....                       | 1,175 |
| By W. J. WATKINSON.                                                                              |       |
| Oxford-street—25, South Mutton-street, and 80, Davies-street, perpetually renewable.....         | 2,200 |
| By PERKINS & CHASER.                                                                             |       |
| Bernard-street—17 and 18, Martin-street, 50 years, ground-rent £5, 10s.....                      | 470   |
| 15, West-street, 26 years, ground-rent £3.....                                                   | 190   |
| 1 to 4, Morten-terrace, 57 years, ground-rent £8, 16s.....                                       | 435   |
| By C. & H. WHITE.                                                                                |       |
| Kennington—61 to 67, and 69 to 77 odd, St. Mark's-road, and improved ground-rents, £47, 10s..... | 1,300 |
| Walworth—21 and 23, Levanon-street, 62 years, ground-rent £5, 10s.....                           | 420   |
| By C. D. FIELD & SONS.                                                                           |       |
| Westminster—90, Great Peter-street; and 4, 5, and 6, Blue Anchor-court, freehold.....            | 835   |
| 88, Great Peter-street; and 1, Blue Anchor-court, freehold.....                                  | 640   |
| Rotherhithe—36, Swan-lane, freehold.....                                                         | 200   |
| By T. H. MAY.                                                                                    |       |
| Upper Norwood, Belvedere—Sandown Villa, 70 years, ground-rent £11, 10s.....                      | 600   |

## MEETINGS.

SATURDAY, JULY 7.

*St. Paul's Ecclesiastical Society.*—Visit to Lincoln, under the guidance of the Rev. Canon Venables. Members to assemble at King's-cross Station at 8.45 a.m.

*Public Sanitary Inspector.*—Visit to Croydon to inspect the Beddington Sewage Farm, the Croydon Water Works, the Croydon Baths, &c.

*Edinburgh Architectural Association.*—Annual excursion to Elie, St. Monie House, Balaskie House, and Kellie Castle.

WEDNESDAY, JULY 11.

*Technical College, Finsbury.*—Conference on Technical Instruction. 8 p.m.

THURSDAY, JULY 12.

*Association of Municipal and Sanitary Engineers and Surveyors.*—Annual meeting at the Institution of Civil Engineers, Great George-street. Annual report and President's address, 12 noon. Papers and discussion, 2.30 p.m. Annual dinner, Criterion Restaurant, 7.30 p.m.

*Sanitary Institute of Great Britain.*—Twelfth annual meeting, Sir Edwin Clark, C.B., in the chair. Address by Dr. B. W. Richardson, F.R.S., on "The Storage of Life as a Sanitary Study." 3 p.m.

FRIDAY, JULY 13.

*Association of Municipal Engineers.*—Annual meeting (continued). Breakfast at Hotel Métropole, 9.15 a.m., after which a visit will be paid to Messrs. Jennings' sanitary works at Stratford. Papers and discussions, 11.30 a.m. Luncheon at Hotel Windsor, Victoria-street, 1.30 p.m., after which visits will be made to works.

SATURDAY, JULY 14.

*Architectural Association.*—Visit to Layer Marney Towers and Church. (See advertisement on first page.)

*Association of Municipal Engineers.*—Annual meeting (continued). At 11 a.m., boat will be taken at the Temple Pier to proceed down the river to inspect (1) The Tower Bridge, (2) Greenwich Ferry, and (3) the new Outfall Sewage Works at Barking.

## Miscellaneous.

## Value of Land at New Barnet, Herts.

On Monday evening Mr. E. Fergusson Taylor sold the first portion of some freehold building land, in plots, suitable for the erection of shops, at the junction of Station and East Barnet roads, adjoining the new post-office buildings and the Barnet station on the Great Northern Railway (main line). The land was title-free and land-tax redeemed. Seven plots were offered, ranging in area from about 100 to 144 square yards each. There was a keen competition for them, and they realised from 250l. to 280l. each. The total area of land offered was 839 square yards, and the total sum realised was 1,880l., or at the rate of nearly 10,500l. per acre, and this for suburban land!

**Flooring for Engine-Houses.**—The *Deutsche Bauwerks-Blatt* recommends long narrow oak panels for the floors of engine-houses. If not perfectly dry, the panels should be placed for some time in specially-constructed drying stoves. The joists of the dead floor should, if possible, be secured to the vaulting by iron hasps. Care must also be taken to fasten down the oak panels with wire nails at least 4 in. long, and to drive them close together. It does not matter whether the oak flooring is divided into compartments by long panels, provided with running ties, or laid in long planks, which must not, however, exceed 2½ in. in width, with alternating butt-joints. The first method possesses the advantage that in repairs, a board which may appear damaged, can be taken out direct, and replaced by another, without much disturbing the other portion of the flooring. A wood floor laid in the manner described is said not to warp, notwithstanding the vibration and other injurious effects to which it is exposed in an engine-house.

**The Imperial Institute.**—A meeting of the Organising Committee of the Imperial Institute was held at Marlborough House on Monday last. His Royal Highness the Prince of Wales, K.G., President, occupied the chair. This being the first meeting since the grant of her Majesty's charter of incorporation to the Imperial Institute, business of considerable importance was transacted. By the terms of the charter the Organising Committee is appointed the temporary governing body of the Institute for a period not exceeding three years from the date of the charter (May 12th, 1888). The previous action of the Organising Committee and of the various sub-committees having been approved, the Earl of Rosebery, Lord Herschell, and Sir John Rose were appointed trustees for the endowment fund, the minimum value of which is fixed by the charter at 140,000l. His Royal Highness the President then nominated Lord Herschell and Sir John Rose, respectively, as Chairman and Vice-Chairman of the Organising Committee, and various special committees were appointed. The Organising Secretary submitted a statement of progress since the date of the last meeting, by which it appeared that the actual funds now available, exclusive of subscriptions from the Indian Empire, and temporarily invested there, amounted to 310,000l. The minutes of the meetings of the various sub-committees held since the 27th of January having been read, and action thereon authorised, the lease for the conveyance of land from the Royal Commissioners for the Exhibition of 1881, and other documents in connexion therewith, were duly approved and executed. The foundations for the main buildings were reported as having been completed in May last, at a cost of 6,000l. On the recommendation of the building sub-committee, the tender of Messrs. John Mowlem & Co. for the making of the new road to be known as the "Imperial Institute-road" was accepted at the sum of 5,825l. The same firm's tender for the main buildings, exclusive of the central and eastern and western towers, was accepted from a list of fifteen competing contractors, the amount of the tender being 142,800l. It may be mentioned here that Mr. T. E. Collcutt, F.R.I.B.A., is the architect of the building, of which we gave a large view in the *Builder* for July 2nd, 1887, followed in our number for July 9th by plans of the ground and principal floors.

## The Marble Hill Estate, Twickenham.

On Wednesday Messrs. Farebrother, Ellis, Clark, & Co. submitted for sale, at the Auction Mart, the historical property familiar to the fashionable world in the Georgian era, and known as Marble Hill, occupying a position on the banks of the Thames at Twickenham. A few weeks ago a notice of the interesting mansion and estate appeared in the *Builder*. The descriptive particulars stated that the property embraced an area of 66½ acres, having a river frontage of 2,000 ft. and 1,750 ft. of road frontage, presenting exceptional facilities for development as a building estate, its capabilities giving an opportunity to the capitalist of making a judicious subdivision of the property, and the creation of building leases, securing a large income in freehold ground-rents. On the other hand, it was specially suitable as a residential estate. The sale was conducted by Sir J. W. Ellis, M.P., who, after advertising to the historical character of the property, expressed a hope that it might be purchased to be continued as a residential domain; but if not, it no doubt might be laid out as one of the finest building estates near the metropolis. The biddings commenced by an offer of 25,000l., and 52,000l., having been reached without any further advance the property was withdrawn.

**New Parish Hall at Llanelli.**—On the 26th ult. took place the "double event" of the laying of the memorial stone and the opening of the Jubilee Hall in Church-street, Llanelli. The new hall was designed by Mr. J. Buckley Wilson, architect, Swansea, and has been built by Mr. William Bassett, of Llanelli. The plan comprises a spacious hall, 72 ft. by 35 ft., which is entered by a narthex the whole width of the building, and 7 ft. wide. There is also a committee-room, 13 ft. by 25 ft. 6 in., and a tea-room with a boiler, and every convenience for tea-meetings. The hall is lighted by sun-burners, the vitiated air escaping through a ventilator in the roof. The external walls are of native stone, with Bath stone quoins, and the interior lined with rose-coloured bricks.

**The English Iron Trade.**—The current of improvement in the English iron market foreshadowed in previous reports has, so far, not received any check, the tendency being still towards greater firmness and a steady trade. The pig-iron market is stronger, notably in the North of England. The shipments of Cleveland iron for the first six months of the present year were nearly 100,000 tons higher than in the first half-year of 1887, and 130,000 tons more than in the corresponding period of 1886. There has also been a further reduction in stocks of Cleveland iron during the past month, and such healthy signs ought to strengthen the pig-iron market. On the other hand, there is the discouraging fact that the Scotch makers go on producing crude material quite recklessly, which, for the most part, finds no other outlet but Connal's store, where, on Saturday last, stocks amounted to over a million tons. It is perfectly useless to hope or to expect that the iron trade generally could be placed on a sounder basis while such an insane policy of over-production is permitted to have full swing. In Scotland itself, with a dull demand, prices are still irregular. There is a fair trade doing in the other iron districts, whilst the business in hematite iron is of a steady nature, and, with an increasing consumption, prices are well maintained. In the manufactured iron market, prices are stiff, and a slight advance is registered, plates being especially strong. A combination has been formed by Staffordshire makers of sheets, who have fixed the price for the next three months at 8l. 5s. for sheets of 20-gauge, 6l. 10s. for 24-gauge, and 7l. 10s. for 27-gauge as a minimum. The steel market is firm, and the prospects of the trade are good. With ship builders, also, the outlook is improving, more orders coming in, whilst there is a better feeling amongst engineers. The strike in the engine-shops on the Tyne has been settled by a compromise.—Iron.

## The Gatton Estate, Surrey.—On

Wednesday the Gatton Estate, near Reigate, was offered for sale at the Auction Mart, by Messrs. Fox & Bousfield. It was described as one of the most interesting properties in the county of Surrey, forming an entire parish within itself. It comprises an ancient mansion, also a second mansion and grounds known as Upper Gatton Park, together with farms, cottages, and grounds, covering altogether an area of upwards of 1,400 acres. The sale took place by order of the owner, Viscount Oxenbridge. The property was offered in eight lots, the first lot submitted being the mansion, grounds, and several farms, covering altogether an area of 806 acres. The biddings, which occupied a long period of time, commenced by an offer of 40,000l., and ultimately the property was sold for 82,200l. The Upper Gatton Park, consisting of a stately residence, grounds, and a farm, containing altogether 458 acres, was next put up, but the price offered, 27,100l., was below the reserve, and it was withdrawn. The next six lots, consisting of several farms and three plots of building land, were all sold, realising a total sum of 25,960l., the aggregate sum produced by the sale (exclusive of Upper Gatton Park) being 108,160l.

## Jennings and Brewer's Apparatus for

## Indicating and Registering the Level of

## Liquids.—In our issue of the 17th September

last (p. 410) we gave an illustrated description of Jennings and Brewer's patent electro-mechanical apparatus for indicating and registering the varying levels of liquids in reservoirs, sewers, &c. We are now informed that results have fully justified the prognostications made as to the adaptability and value of the apparatus for the purpose intended. A set of these instruments has been fixed for the Maidstone Water Company, and they are now working between the Farleigh pumping-station and the Barming reservoir, a distance of one mile and a half, the returns being accurately given. Not only is the depth of water at any moment indicated on the dial, but a permanent record of the varying depth is automatically registered on a weekly diagram provided for this purpose. Two similar sets of instruments are now being made for the Improvement Commissioners at Bournemouth, where they will be utilised in connexion with the new sea-water scheme designed by Mr. G. R. Andrews, the engineer.

## The Wimbledon District Brick, Tile,

## and Pottery Co.—The prospectus of this new

limited liability company will be found in our advertisement columns this week.



**Sale of Building Estates and Grounds at Wimbledon.** On Monday Messrs. Walker & Runtz offered for sale, at the Auction Mart, two freehold building estates at Wimbledon, comprising the property known as "The Grange," overlooking Wimbledon Common; and also the Wimbledon Hill Estate, both estates being described as ripe for immediate building operations. The property submitted likewise included a number of freehold ground-rents, amounting to upwards of 450*l.* per annum, secured upon shops, business premises, and residences situated on Wimbledon Hill, Worple-road, Ridgeway-place, and other parts of Wimbledon. It was stated that at the expiration of the leases the reversions to the rack-rents would amount to 3,000*l.* per annum. The ground-rents were the first portion of the property offered. They were twenty-seven in number, the several rents amounting for the most part to from 13*l.* to 40*l.* per annum each, whilst four of them were for 400*l.* per annum each. The leases for the expired terms of from 77 to 99 years. The sale was very largely attended, and there was a brisk and close competition for the rents submitted, the whole of which were rapidly sold, the smaller rents, from 13*l.* to 20*l.* each, realising from 450*l.* to 600*l.*, whilst those at 40*l.* per annum were sold at 1,200*l.* each, the total proceeds amounting to 17,500*l.* The prices paid represented about thirty years' purchase, or an annual return of 3*l.* per cent. on the outlay. The sale of the building sites was next proceeded with, the first part of the property offered being the Wimbledon Hill Estate, which was divided into 44 plots of freehold building land, having frontages to several wide roads. It was stipulated that the value of the buildings to be erected in the Mansel and Worple roads on this estate should not be less than 1,000*l.*, and in the Raymond and Malcolm roads not less than 800*l.* The plots have frontages varying from 35 ft. to 40 ft., and depths of from 120 ft. to 250 ft. Several of the smaller plots were sold at from 200*l.* to 220*l.* each. "The Grange" estate, containing 45 plots, was the last portion of the property offered. It was stipulated, as regards the value of the plots, that the value of the buildings to be erected should not be less than 1,500*l.* The plots facing the south side of Wimbledon Common, having frontages of 57 ft., and depths of 240 ft., were sold for 400*l.* each. Six other plots having frontages of 50 ft. to "The Grange" (a new road which has been formed through the estate), and depths of from 150 ft. to 160 ft., realised 300*l.* each, and 20 adjoining plots, having similar frontages to "The Grange," and depths of from 104 ft. to 120 ft., were sold for 250*l.* each; the entire proceeds of the day's sale, including the ground-rents, amounting to upwards of 26,000*l.*

**A Model Village.** Mr. Hartley, large employer of labour in jam manufacture, has been following the example set by the late Sir Titus Salt, and making another "Saltaire" village for his employes at Aintree, near Liverpool. The model village was the subject of a competition, in which the designs of Messrs. W. Sgden & Son, of Leek, were selected out of eighty-five designs sent in competition. A design equal in merit was sent by Mr. F. Mee, and each of these competitors, therefore, received a premium of fifty guineas, the amount promised for the first premium. A third premium of twenty guineas was awarded for a design by Messrs. W. E. Willink and P. C. Thicknesse.

**Liverpool Water Supply.**—As was anticipated, the heavy and long-continued rainfall of Monday and Tuesday has (according to the *Liverpool Daily Post*) increased the volume of water in Rivington Reservoir, and it is stated on very good authority that over 60,000,000 gallons of water have been impounded from the watershed whence the Liverpool supply is gathered during the period referred to. The special sub-committee of the Water Committee had a meeting on Tuesday, when the subject of the available water-supply was again discussed. Reference was made to the recent rainfall, and the engineer is to report as to what effect it has had on the water available for the district.

**The Patent Victoria Stone Company (Limited).**—This Company has been formed to carry on the business of the manufacture and sale of that now well-tried material known as the patent Victoria Stone. The prospectus of the Company appears in our advertising pages.

**The Climbers Memorial Competition, Edinburgh.**—Some time ago the Edinburgh Town Council resolved, in consideration of his many public services, to erect a memorial statue to the late Dr. William Chambers. Designs were invited from sixteen sculptors resident in Edinburgh and Glasgow, and Monday last was the day fixed for these being exhibited at the Royal Academy Galleries at the Mound for the purpose of being adjudicated on. Up to four o'clock, however, when the galleries closed for the day, only six models had, according to the *Scotsman*, been received; and it is quite understood that a number of the elder sculptors have declined to go into a competition of this nature. The Town Council have asked Mr. T. Brock, A.R.A., London, to act as their artistic assessor, and this gentleman will begin his inspection of the models immediately. According to the conditions of the competition the author of the design judged first in the merits will employ the sculptor of his own work into sculpture; and the winners of 50*l.* and 25*l.* are to be awarded to the authors of the designs judged second and third in merit respectively. The whole cost, including statue, pedestal, and foundation complete, is not to exceed 1,250*l.*

## PRICES CURRENT OF MATERIALS.

| NUMBER.                    |          | $\mathcal{L}$ 8s. d. | $\mathcal{L}$ s. d. |
|----------------------------|----------|----------------------|---------------------|
| Greenheart, B.G.           | 1 in     | 6 10 0               | 7 10 0              |
| Teak, E.I.                 | head     | 8 0 0                | 12 10 0             |
| Sempak, T.S.               | foot     | 6 0 0                | 10 0 0              |
| Penang, C.A.               | head     | 2 17 0               | 4 15 0              |
| P. Bantsee, &c.            | .....    | 2 0 0                | 4 0 0               |
| Oak                        | .....    | 2 0 0                | 4 10 0              |
| Canada                     | .....    | 6 0 0                | 10 0 0              |
| Pine, Canada red           | .....    | 2 10 0               | 3 10 0              |
| ..... yellow               | .....    | 2 10 0               | 4 0 0               |
| Lath, Bantsee              | 1 fathom | 3 10 0               | 5 0 0               |
| St. Petersburg             | .....    | 2 10 0               | 3 0 0               |
| Woods                      | .....    | 2 10 0               | 3 0 0               |
| Deal, 4th and 2nd 1st      | std. 100 | 6 10 0               | 9 10 0              |
| ..... 4th and 3rd          | .....    | 6 10 0               | 7 10 0              |
| Rugs                       | .....    | 9 10 0               | 14 10 0             |
| St. Petersburg, 1st yellow | .....    | 8 0 0                | 9 0 0               |
| ..... 2nd                  | .....    | 7 0 0                | 10 0 0              |
| ..... white                | .....    | 7 0 0                | 10 0 0              |
| Sisal                      | .....    | 15 10 0              | 17 0 0              |
| Whites                     | .....    | 8 0 0                | 17 0 0              |

## COMPETITIONS AND CONTRACTS.

*Epitome of Advertisements in this Number.*

### COMPETITIONS.

| Nature of Work.       | By whom required.                | Premium.                                           | Designs to be delivered. | Page. |
|-----------------------|----------------------------------|----------------------------------------------------|--------------------------|-------|
| School Buildings..... | Governors, Friars School, Bangor | 20 <i>l.</i> to each unsuccessful Competitor ..... | Not stated..             | 1.    |

## CONTRACTS

| By Nature of Works, or Materials.            | By whom required.       | Architect, Surveyor, or Engineer. | Time to be delivered. | Page. |
|----------------------------------------------|-------------------------|-----------------------------------|-----------------------|-------|
| Prepared                                     |                         |                                   |                       |       |
| Carpeting or Paving and Repairs .....        | Chelsea Guardians       | Office .....                      | July 10th             | ii.   |
| Painting Works .....                         | St. Luke's Vestry       | do, .....                         | July 11th             | x.    |
| Other Works .....                            | West Ham Union School   | do, .....                         | do, .....             | ii.   |
| Plumbing Works .....                         | Parkington Guardians    | A. & C. Hanson .....              | July 12th             | x.    |
| Lavatory and Cloak-rooms .....               | Leicester Cw.           | J. Gordon .....                   | do, .....             | ii.   |
|                                              | St. George's-Martyr,    |                                   |                       |       |
|                                              | Southwark Vestry.       | Official .....                    | do, .....             | ii.   |
| Boards, Guest-rooms, Grate                   | Wagstaffs, H.L. Wis-    |                                   |                       |       |
| Rep., or to Refreshment House, Fum-bury Park | stonsford Lord Board    | — Lacey .....                     | do, .....             | xv.   |
| Cast Iron Water Mains .....                  | Met. Board of Works.    | Official .....                    | do, .....             | x.    |
| Road Lining and Paving Works .....           | Hastings U.R.S.A. ....  | Jeffrey & Skiller .....           | July 14th             | ii.   |
| Water at R. & C. Bayton .....                | Fulham Vestry .....     | J. P. Norington .....             | do, .....             | x.    |
| N. Pavilion, and Additions to Infirmary      | N. W. R. Wy. Co. ....   | Official .....                    | do, .....             | x.    |
| Sewage Works .....                           | Greenwich Union .....   | I. Dawdley .....                  | July 15th             | ii.   |
| Water at Vestry Hall and Offices .....       | Leicester Corporation . | J. Gordon .....                   | do, .....             | x.    |
|                                              | St. Luke's Vestry       | Official .....                    | July 16th             | x.    |
| Warehouses .....                             | Liverpool Corporation . | G. F. Deacon .....                | July 17th             | x.    |
| Southern Approach to Tower Bridge .....      | Bridge House Est. Com.  | J. W. Barry .....                 | July 24th             | ii.   |
| M. & N. Drainage Works .....                 | Water & Greenwich Cor.  | J. T. Evers .....                 | do, .....             | x.    |
| Water at Bridge, or at Tower, Lynton         | Committee .....         | — Croxall .....                   | July 25th             | x.    |
| Public Baths, &c., St. George's, Hanover-sq. | The Commissioners ..... | Francis James Smith .....         | August 1st            | ii.   |
| Coverage and Sewage Pipes, &c., Works        | Kingston R.S.A. ....    | J. C. Phillips .....              | do, .....             | x.    |
| Painting by Oil or Electric                  | travellers, U.S.A. .... | Official .....                    | do, .....             | x.    |
| Additions, &c., to Cabins and Stores of Ship | War Department .....    | do, .....                         | Not stated...         | ii.   |
| Works at Fort Wallington, Portsmouth .....   | do, .....               | do, .....                         | do, .....             | x.    |
| Annual Reports or Painting to Schools .....  | do, .....               | do, .....                         | do, .....             | x.    |
| Various Appointments .....                   | do, .....               | do, .....                         | do, .....             | x.    |
| Tar Pavement .....                           | do, .....               | do, .....                         | do, .....             | ii.   |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.]

ADDLESTONE (Surrey). For alterations and additions to Tudor House, Addlestone, for Mr. D'Arcy S. Blackburn. Messrs. Maylard & Stutfield, 6, Great Queen-street, Westminster, surveyors.

|                                       |        |   |   |
|---------------------------------------|--------|---|---|
| A. A. Gale, Woking*                   | £1,397 | 0 | 0 |
| J. Martin, Addlestone*                | 1,385  |   |   |
| T. Knight & Sons, Chertsey            | 1,275  | 0 | 0 |
| C. Ascell, Lambeth                    | 1,122  | 0 | 0 |
| Kirk Bros., Battersea (accepted)..... | 960    |   |   |
| H. Brown & Sons, Addlestone*          | 965    | 0 | 0 |

\* Received too late.

| TIMBER (continued).       |    |    |    |    |    |    |
|---------------------------|----|----|----|----|----|----|
|                           | £  | s. | d. | £  | s. | d. |
| Canada, Pine, 1st         | 12 | 0  | 0  | 23 | 0  | 0  |
| " " 2nd                   | 6  | 0  | 0  | 15 | 0  | 0  |
| " " 3rd, &c.              | 7  | 6  | 0  | 13 | 0  | 0  |
| " Spruce, 1st             | 7  | 0  | 0  | 9  | 10 | 0  |
| " " 3rd and 2nd           | 6  | 0  | 0  | 7  | 10 | 0  |
| New Brunswick, &c.        | 6  | 0  | 0  | 7  | 5  | 0  |
| Battens, all kinds        | 4  | 10 | 0  | 11 | 0  | 0  |
| Flannels, 1st             | 10 | 0  | 0  | 12 | 0  | 0  |
| Parasol, 1st              | 0  | 7  | 0  | 0  | 9  | 6  |
| Second                    | 0  | 5  | 0  | 0  | 8  | 6  |
| Other qualities           | 0  | 3  | 0  | 0  | 4  | 6  |
| Cedar, 1st                | 0  | 7  | 0  | 0  | 6  | 6  |
| Honduras, &c.             | 0  | 0  | 3  | 0  | 0  | 32 |
| Australian                | 0  | 0  | 23 | 0  | 0  | 23 |
| Mahogany, Cuba            | 0  | 0  | 4  | 0  | 0  | 4  |
| Sic. Doongo, cargo orange | 0  | 0  | 4  | 0  | 0  | 4  |
| Mexican                   | 0  | 0  | 4  | 0  | 0  | 4  |
| Tobacco                   | 0  | 0  | 4  | 0  | 0  | 4  |
| Honduras                  | 0  | 0  | 4  | 0  | 0  | 4  |
| Rosa, 1st                 | 0  | 0  | 10 | 0  | 0  | 10 |
| Bor, Turkey               | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian           | 0  | 0  | 4  | 0  | 0  | 4  |

## METALS.

|                                  |    |    |    |    |    |
|----------------------------------|----|----|----|----|----|
| LEAD—Bar, Welsh, in London.....  | 4  | 17 | 0  | 0  | 0  |
| at works in Wales.....           | 4  | 7  | 8  | 4  | 10 |
| Staffordshire, London.....       | 5  | 5  | 0  | 7  | 0  |
| COPPER—                          |    |    |    |    |    |
| British, cake and ingot..... ton | 75 | 10 | 0  | 75 | 0  |
| Best selected .....              | 74 | 0  | 0  | 76 | 0  |
| Sheets, strong .....             | 82 | 0  | 0  | 0  | 0  |
| Chili, bars .....                | 81 | 0  | 0  | 81 | 10 |
| YELLOW METAL.....lb.             | 0  | 0  | 7½ | 0  | 7½ |

LOAD  
Pig

|                              |    |    |   |   |   |   |
|------------------------------|----|----|---|---|---|---|
| English, common brands ..... | 12 | 12 | 6 | 0 | 0 | 0 |
| Sheet English .....          | 18 | 12 | 6 | 0 | 0 | 0 |

SPELLING—

|                         |     |    |    |   |    |   |   |
|-------------------------|-----|----|----|---|----|---|---|
| Silesian, special ..... | ton | 15 | 0  | 0 | 0  | 0 | 0 |
| Ordinary brands.....    |     | 14 | 15 | 0 | 15 | 0 | 0 |

TIN  
Stre

|                      |    |    |   |   |   |   |
|----------------------|----|----|---|---|---|---|
| Australian .....     | 76 | 0  | 0 | 0 | 0 | 0 |
| English Ingots ..... | 83 | 11 | 0 | 0 | 0 | 0 |

## ZINC

English sheet.....ton 19 0 0 19 10 0

Linseed ..

|                        |    |   |   |    |   |   |
|------------------------|----|---|---|----|---|---|
| Cocoonnut, Cocam ..... | 23 | 0 | 0 | 23 | 0 | 0 |
| Ceylon .....           | 22 | 0 | 0 | 22 | 5 | 0 |

## Raneseed.

|                          |         |         |
|--------------------------|---------|---------|
| 33 brown .....           | 22 10 0 | 22 15 0 |
| Cottonseed refined ..... | 20 10 0 | 0 0 0   |

## Tallow and

|                        |   |    |   |    |   |   |
|------------------------|---|----|---|----|---|---|
| Lubricating, U.S. .... | 3 | 15 | 0 | 6  | 0 | 0 |
| "    refined .....     | 7 | 0  | 0 | 12 | 0 | 0 |

|                             |   |   |   |   |   |
|-----------------------------|---|---|---|---|---|
| TURPENTINE                  |   |   |   |   |   |
| American, in casks.....cwt. | 1 | 9 | 0 | 0 | 0 |



**BARNET.**—For works in Manor-road, for the Barnet Local Board. Mr. W. H. Mann ridge, surveyor:—  
 Cook ..... £119 0 0  
 Pyle ..... 317 0 0  
 Nickolls ..... 275 0 0  
 Currow ..... 232 0 0  
 Capner ..... 235 10 0  
 Marriott (accepted) ..... 233 0 0

**BROMLEY (Kent).**—For the erection of four houses, Newbury-road, Bromley, Mr. Henry J. Player, architect and surveyor, 17, High-street, Bromley, Kent:—  
 Taylor & Son, Bromley (accepted) ..... £200 0 0

**CRICKLEWOOD.**—For making-up Yew, Ash, and Elm groves, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-M. Inst. C.E., surveyor:—  
 Elmer, New-gr. As-gr. Total.  
 G. Bell ..... £267 ..... £262 ..... £2,611  
 Newell & Robinson ..... 617 ..... 380 ..... 1,580  
 R. Ballard\* ..... 608 ..... 333 ..... 1,500  
 T. Adams ..... 567 ..... 375 ..... 1,497  
 \* Accepted.

**THE BOROUGH.**—  
 Elmer, New-gr. As-gr. Total.  
 Farthing & Co. (Prop.) ..... £23 ..... £23 ..... £217  
 J. Smart\* ..... 85 ..... 52 ..... 77 11 8 ..... 213  
 George Bell ..... 85 ..... 60 ..... 78 0 0 ..... 218  
 \* Accepted.

**CROYDON.**—For the erection of three slaughter-houses, &c., for the Corporation of Croydon, from the plans and under the superintendence of Mr. Thomas Walker, Assoc. M. Inst. C.E., Borough Engineer:—  
 Smith & Buller ..... £1,250 0 0  
 S. Page ..... 1,185 0 0  
 H. W. Idle ..... 1,183 0 0  
 W. Hill ..... 1,125 0 0  
 King Bros. & Co. .... 1,111 0 0  
 G. R. Bryon ..... 1,095 0 0  
 E. S. Pearce ..... 1,083 0 0  
 A. W. Deacon & Co. .... 1,061 0 0  
 A. Burrage ..... 1,050 0 0  
 Caplan & Redgrave ..... 1,018 0 0  
 H. Mayo ..... 1,015 0 0  
 J. Smith & Sons (accepted) ..... 867 0 0  
 H. Ockendon ..... 971 0 0

**GRAYS (Essex).**—For the erection of a manager's house and pair of cottages, for the Grays Paper Works, Mr. G. M. Lawford, architect, 7, Westminster-chambers, S.W.:—  
 W. Johnson, Wandsworth-common ..... £795 0 0  
 A. Brickell, Kensington ..... 680 0 0  
 Kirk Bros., Battersea ..... 598 0 0  
 J. Thompson & Son, Grays ..... 598 15 0  
 J. Brown, Grays ..... 580 0 0  
 H. J. Carter, Grays ..... 498 0 0

**GREENWICH.**—For the enlargement of the Randall-plant & S. Green & Co. by 100 places, for the School Board for London. Mr. T. J. Bailey, architect:—  
 Stimpson & Co., Brompton-road\* ..... £1,400 0 0  
 H. Johnson ..... 1,368 0 0  
 H. L. Holloway ..... 1,360 0 0  
 \* Recommended by the Works Committee for acceptance.

**HACKNEY.**—For alterations to the Cat and Mutton, and erecting stables, &c., in rear of same, at London-fields, Hackney, for Mr. F. W. Ayres, Mr. Lowcock, architect, No. 8, Bishopgate-street Within, E.C.:—  
 Gosnell ..... £2,066 0 0  
 Anley, Dalston ..... 2,430 0 0  
 Ivory, Great Cambridge-street ..... 2,416 0 0  
 West Bros., Dalston ..... 2,350 0 0  
 Hughes, Homerton ..... 2,003 0 0  
 Stephenson, Bishopgate-street ..... 1,845 0 0  
 F. G. Higgs, Bethnal-green-road ..... 1,837 0 0  
 Spencer & Co. (accepted) ..... 1,825 0 0  
 J. Walker, Poplar (withdrawn) ..... 1,790 0 0

**HACKNEY.**—For alterations and extension to schools in rear of Hendon, at Laureston-road, Hackney. Mr. Charles Burr, architect, Chelsea:—  
 F. G. Higgs, Bethnal-green-road ..... £271 0 0  
 Cox, Ash-grove, Hackney ..... 870 0 0  
 G. W. Beale, Cambridge-heath ..... 849 0 0

**HAMMERSMITH.**—For the enlargement of the Beckenbury-road School, Hammersmith (Chelsea V.), by 400 places, for the School Board for London. Mr. T. J. Bailey, architect:—  
 F. R. Tozer ..... £5,308 0 0  
 T. Bendon ..... 4,542 0 0  
 G. Lyford ..... 4,498 0 0  
 S. J. Jerrard ..... 4,277 0 0  
 H. Hart ..... 4,215 0 0  
 W. Johnson ..... 4,200 0 0  
 Stimpson & Co., Bishopgate-street ..... 4,170 0 0  
 H. L. Holloway ..... 4,080 0 0  
 A. R. Flew & Co. .... 3,700 0 0  
 \* Recommended by the Works Committee for acceptance.

**HARLOW.**—For the erection of house at Roxborough Park-road, for Mr. F. S. Winkley, Mr. W. C. Marshall, architect. Quantities by Mr. E. T. Paine:—  
 Perry & Co., Bow ..... £1,665 0 0  
 H. S. Lee, New Wandsworth\* ..... 1,695 0 0  
 \* Accepted, with modifications.

**HENDON.**—For tar-paving, granite crossings, &c., to public footpaths in Hendon, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-M. Inst. C.E., surveyor:—  
 Nowell & Robinson ..... 2½ per cent. below schedule of prices.  
 George Bell ..... 5 " " "  
 Thos. Adams ..... 7½ " " "  
 S. Hudson\* ..... 11 " " "  
 \* Accepted.

**HENDON.**—For the sewerage of Algenon-road and John-street, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-M. Inst. C.E., surveyor:—  
 Algenon-road. John-st.  
 George Bell ..... £120 ..... £123  
 T. Adams ..... 119 ..... 123  
 R. Ballard (accepted) ..... 89 ..... 84

**HOTTON.**—For the enlargement of the Infants' department of the Wellington-street School, Hotton (Hackney), by 40 places, for the enlargement of the School Board for London. Mr. T. J. Bailey, architect:—  
 G. R. Earsdon ..... £540 0 0  
 F. & F. J. Wood, Cleveland-street ..... 335 0 0  
 \* Recommended by the Works Committee for acceptance.

**LAMBETH.**—For alterations and repairs to premises at rear of Nos. 37 to 41, Lower Marsh, Lambeth, and in Robert-street adjoining, for the executors of the late Mr. E. Grove. Messrs. Ford & Heskeith, architects. Messrs. Karlake & Mortimer, surveyors:—  
 Nightingale ..... £1,100 0 0  
 Lawrence ..... 681 0 0  
 Marsand ..... 841 0 0  
 Ladley ..... 532 10 0  
 Mills ..... 795 4 0  
 Mills ..... 789 0 0

**LAMBETH.**—For providing an additional playground for the Girls' and Infants' departments, at the Waterloo-road School (West Lambeth C), for the School Board for London. Mr. T. J. Bailey, architect:—  
 G. R. Earsdon ..... £234 0 0  
 W. Downes ..... 330 0 0  
 Davis Bros. .... 318 0 0  
 T. Bendon ..... 314 12 0  
 H. L. Holloway ..... 298 0 0  
 J. W. Roy\* ..... 287 0 0  
 \* Recommended by the Works Committee for acceptance (less 4½ p. cent. for old material).

**LEICESTER.**—For work required in the construction of foundations for engines and engine-house, pump-works, screening chamber, and the sinking of a well for water-supply, with other works in connection therewith, at the proposed new pump-station in connection with the new sewage scheme for the Leicester Corporation. Plans, specification, and quantities by Mr. J. Gordon, C.E., Borough Surveyor:—  
 Geo. Darbury, Leicester ..... £8,000 0 0  
 J. O. Jewsbury, Leicester ..... 5,695 5 7  
 Geo. Longdon & Son, Sheffield ..... 5,433 17 0  
 Jas. & J. Biggs, Birmingham ..... 5,431 11 11  
 Enoch Tempest, Leicester ..... 5,309 0 0  
 Jas. Dickson, Leicester ..... 5,000 0 0  
 Holmes & King, Liverpool ..... 4,998 12 11  
 Bryn W. Ward, Whitstone ..... 4,772 19 6  
 S. & E. Bentley, Leicester\* ..... 4,434 16 9  
 James Evans, Birmingham ..... 3,822 18 31  
 \* Accepted. † Withdrawn.

**LEICESTER.**—For the laying of about 3,364 lineal yards of 33-inch cast-iron pipes, with bends and other special castings, for rising mains to the new sewage farm, and forming a new road in connection therewith, for the Corporation of Leicester, according to plans, specification, and quantities by Mr. J. Gordon, C.E., Borough Surveyor:—  
 Bryn W. Ward, Whitstone ..... £3,152 13 11  
 Jas. Neal, Manchester ..... 4,799 4 4  
 Sam. Jovett, Liverpool ..... 4,478 18 11  
 Enoch Tempest, Leicester ..... 3,978 10 3  
 Jas. & J. Biggs, Birmingham ..... 3,972 0 0  
 Frank E. Ray, Sheffield ..... 3,768 0 0  
 Jno. M. Kay, Stoke-on-Trent ..... 3,758 10 6  
 Jas. Dickson, St. Albans ..... 3,166 18 8  
 S. & E. Bentley, Leicester ..... 3,324 19 3  
 George Low, Kidderminster ..... 3,184 1 1  
 Holmes & King, Liverpool\* ..... 2,890 0 11  
 \* Accepted.

**LONDON.**—For the erection of the main buildings of the Imperial Institute, South Kensington (exclusive of the central, eastern, and western towers). Mr. T. E. Collcutt, F.R.I.B.E., architect:—  
 John Mowlem & Co. (accepted) ..... £142,800 0 0  
 [Fourteen other tenders were sent in.]  
 For the Formation of Imperial Institute Road.  
 John Mowlem & Co. (accepted) ..... £5,285 0 0

**LONDON.**—For building works at the Cripples' Home, Marylebone-road. Messrs. Wm. G. Habershon & Fawcett, architects:—  
 Lawrence & Co. .... £9,680 0 0  
 Holland & Hannen ..... 8,615 0 0  
 Greagar ..... 8,378 0 0  
 Putnam & Fotheringham ..... 8,363 0 0  
 Beutley ..... 8,258 0 0  
 Maides & Harper ..... 8,187 0 0  
 Jones & Co. .... 7,982 0 0  
 Gregory & Co. .... 7,777 0 0

**LONDON.**—For the erection of ten houses, Mape-street and Menotti-street, Bethnal-green, for Mrs. M. Stone. Messrs. Thos. and Wm. Stone, architects, Great Winchester-street, London-wall:—  
 Chessum, Great Eastern-street ..... £4,191 0 0  
 Atherton & Latta ..... 3,995 0 0  
 Thomson & Son, Hackney-road ..... 3,425 0 0  
 G. W. Beale, Cambridge-heath ..... 3,316 0 0  
 Edwards, Cambridge-heath ..... 3,200 0 0  
 Knight, Canorbet-street ..... 3,157 0 0  
 Jarvis & Sons, Hackney-road ..... 2,869 0 0  
 F. G. Higgs, Bethnal-green-road ..... 2,800 0 0  
 Baalam Bros., Kent-road (accepted) ..... 2,840 0 0

**LONDON.**—For sundry alterations, &c., to the Primitive Methodist H. & Dept. C. Commercial-road, E., for the Rev. J. Toulson. Messrs. Thos. and Wm. Stone, architects, Great Winchester-street, London-wall, E.C.:—  
 Hemmiman ..... £220 0 0  
 F. G. Higgs, Bethnal-green-road ..... 188 17 0  
 Avas (accepted) ..... 148 0 0

**LONDON.**—For alterations and additions to the Conservative Club, Hanover Park, Peckham, for the Executive Committee. Messrs. H. H. Leonard & Clarke, surveyors:—  
 General Works. Roof to Hall. Total.  
 Goad ..... £1,165 ..... £143 ..... £1,308  
 Morter ..... 1,490 ..... 96 ..... 1,586  
 Greenwood ..... 1,423 ..... 94 ..... 1,517  
 Smith ..... 1,377 ..... 120 ..... 1,497  
 Green & Lea ..... 1,335 ..... 137 ..... 1,472  
 Holloway ..... 1,320 ..... 125 ..... 1,445  
 Parker ..... 1,280 ..... 120 ..... 1,400  
 Cox ..... 1,280 ..... 120 ..... 1,400  
 Nightingale ..... 1,240 ..... 100 ..... 1,340  
 Avas ..... 1,200 ..... 100 ..... 1,300

**LONDON.**—For sundry alterations to No. 323, Hackney-road, for Mr. Dunn, Mr. R.P. Noley, architect, Bucklersbury:—  
 Faulkner ..... £410 0 0  
 Oliver ..... 382 0 0  
 G. W. Beale, Cambridge-heath ..... 368 0 0  
 Sawyer ..... 247 10 0  
 Jackson & Told, Hackney-road ..... 238 0 0  
 F. G. Higgs, Bethnal-green-road ..... 230 0 0  
 Collings, Grove-road (accepted) ..... 213 0 0

**LONDON.**—For the erection of two cottages, Dihy-street, Bethnal-green, for Mr. Conway. Mr. J. M. Knight, architect, Banerford-road:—  
 F. G. Higgs, Bethnal-green-road ..... £248 0 0  
 S. W. Hawkins ..... 425 0 0  
 Mosley ..... 400 0 0  
 B. Wire, Church-row (accepted) ..... 395 0 0  
 Steward ..... 349 0 0

**LONDON.**—For sundry alterations to the Sir Robert Peel, Kilburn:—  
 Wetherill, Lee, & Martin (accepted) ..... £225 0 0

**LONDON.**—For the erection of proposed mission-house for St. Michael's, Camden-town. Mr. Lacy W. Ridge, architect:—  
 Drew ..... £1,670 0 0  
 Nightingale ..... 1,683 0 0  
 Tatnall ..... 1,376 0 0  
 Williams ..... 1,373 0 0  
 Ashby Bros. .... 1,350 0 0  
 Patman & Fotheringham ..... 1,174 0 0  
 Scrivener ..... 1,144 0 0

**LONDON.**—For rebuilding The Fountain public-house, New street, Broad-street, Golden-square, for Messrs. J. Huggins & Co. Mr. Wm. West, architect and surveyor:—  
 Rebuilding. New Party. Total.  
 Brass ..... £2,764 ..... £112 ..... £2,764  
 Nightingale ..... 2,533 ..... 150 ..... 2,683  
 Pa rick ..... 2,470 ..... 140 ..... 2,610  
 Hall, Beddall, & Co. .... 2,387 ..... 155 ..... 2,542  
 Peto ..... 2,270 ..... 140 ..... 2,419

**LONDON.**—For the construction of a block of shops and offices, in Great Tower-street, adjoining the Joint Stock Bank. Mr. Deless Joseph, architect, 17, Banquhall-street, E.C.:—  
 Perry & Co., Bow (accepted) ..... £9,567 0 0

**LONDON.**—For providing a covered playground for the Infants' department, at the Broad-street (Lower Hamlets L), School, for the School Board for London. Mr. T. J. Bailey, architect:—  
 G. R. Earsdon ..... £180 0 0  
 T. Bendon ..... 130 0 0  
 F. & F. J. Wood ..... 124 0 0  
 \* Recommended by the Works Committee for acceptance.

**LONDON.**—For providing an additional playground for the Infants' department, at the College-road-street (Tower Hamlets L) School, for the School Board for London. Mr. T. J. Bailey, architect:—  
 T. Bendon ..... £317 0 0  
 G. R. Earsdon ..... 305 0 0  
 F. & F. J. Wood ..... 287 0 0  
 \* Recommended by the Works Committee for acceptance.

**LONDON.**—For cleaning, painting, &c., at Betts-street School, St. George's, for the School Board for London. Mr. T. J. Bailey, architect:—  
 Johnson ..... £323 0 0  
 Smith ..... 249 0 0  
 E. East ..... 205 7 0  
 G. Barker ..... 205 0 0  
 F. & F. J. Wood ..... 175 0 0

**LONDON.**—For painting, &c., exterior, Shap-street School, Kingsland:—  
 F. & F. J. Wood ..... £126 0 0  
 Fritchard ..... 112 0 0  
 G. Barker ..... 105 0 0  
 Grover ..... 91 0 0  
 Dearing ..... 76 0 0  
 Fleaman ..... 73 0 0  
 Green ..... 70 0 0

**LONDON.**—For painting, &c., at Summerford-street Schools, Bethnal-green:—  
 F. & F. J. Wood ..... £185 0 0  
 Willmet ..... 169 0 0  
 G. Barker ..... 168 0 0  
 Johnson ..... 140 0 0  
 Davis ..... 129 0 0

**MORTLAKE.**—For the erection of lecture-hall, billiard-room, lavatories, and offices, and sundry alterations to the Mortlake and Barnes Liberal Club. Mr. T. Chapman Barnard, architect, Richmond. Quantities supplied:—  
 Carman, Richmond ..... £1,316 0 0  
 Higgs, London ..... 1,283 0 0  
 Higgs & Tribe, Putney ..... 1,270 0 0  
 Hunt, Barnes ..... 1,240 0 0  
 Hickenham, Fiddington ..... 1,230 0 0  
 Jeld, Kingston ..... 1,117 0 0

**PUTNEY.**—For the erection of a house and stables on Putney-hill, for Dr. W. S. Wyman. Messrs. T. Chaffield Clarke & Son, architects, 63, Bishopgate-street Within:—  
 Woodard ..... £5,457 0 0  
 Adamson ..... 5,300 0 0  
 Nightingale ..... 5,079 0 0  
 Lawrence ..... 5,075 0 0  
 Colls & Sons ..... 5,019 0 0  
 Arnes ..... 5,000 0 0  
 Macey & Sons ..... 4,860 0 0  
 Holloway ..... 4,839 0 0  
 Aris ..... 4,785 0 0  
 W. Johnson ..... 4,765 0 0  
 Cox ..... 4,687 0 0  
 Hart ..... 4,510 0 0

**SPITALFIELDS.**—For the erection of a warehouse in Fashion-street, Spitalfields, for Mr. R. Hains. Mr. R. W. Hobden, architect:—  
 Owen, Spitalfields ..... £1,165 0 0  
 A. G. Allard ..... 1,160 0 0  
 Brown, Son, & Co., Candahar Works, Battersea (accepted) ..... 1,150 0 0



**SOUTHWARK.**—For erecting new w.c.s for boys and infants, at the Hunter-street School (Southwark), for the School Board for London. Mr. T. J. Bailey, architect:—  
 G. R. Eardson ..... £315 0 0  
 T. Bendon ..... 291 10 0  
 H. L. Holloway ..... 394 0 0  
 J. W. Roy ..... 283 0 0  
 T. Linfield ..... 282 0 0  
 J. Bullers ..... 273 0 0  
 H. H. Hollingsworth ..... 280 0 0  
 M. McCarthy ..... 267 0 0  
 David Bros. .... 257 0 0  
 King Bros. & Co.\* ..... 253 0 0  
 \* Recommended by the Works Committee for acceptance.

**STOCKWELL.**—For the erection of proposed new vicarage-house of St. Michael's, Stockwell. Mr. Ewan Christian, architect:—

|                         | House. | Pence Wall. | Total. |
|-------------------------|--------|-------------|--------|
| Roberts .....           | 22,005 | 227         | 22,232 |
| Dove .....              | 2,375  | 31          | 2,406  |
| Maxwell .....           | 2,145  | 18          | 2,163  |
| Tyrell .....            | 2,127  | 10          | 2,137  |
| Brace .....             | 2,073  | 23          | 2,096  |
| Holloway .....          | 2,073  | 20          | 2,093  |
| Marsland .....          | 2,065  | 25          | 2,090  |
| Nightingale .....       | 2,030  | 17          | 2,047  |
| F. & H. P. Higgin ..... | 2,030  | 23          | 2,053  |
| Charlton .....          | 2,018  | 17          | 2,035  |

**WESTMINSTER.**—For the enlargement of the Horseferry-road School (Westminster A.P.) by 54 places, for the School Board for London. Mr. T. J. Bailey, architect:—  
 J. Holloway ..... £2,900 0 0  
 W. Down ..... 2,892 0 0  
 D. Charteris ..... 2,874 0 0  
 W. Oldrey & Co. .... 2,836 0 0  
 W. Johnson ..... 2,803 0 0  
 H. L. Holloway ..... 2,725 0 0  
 Stimpson & Co., Brompton-road\* ..... 2,630 0 0  
 \* Recommended by the Works Committee for acceptance.

**Stores, Ipswich.**—List of tenders for new stores at Ipswich received, but without senders' names, therefore it cannot be inserted. We require senders' names in all cases.

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W. M.—C. J. I.—A. B. (like other such questions, could not be answered without inspection of the building. It is quite on how and where the wet comes in; whether it is through a too porous material, or whether it is in the interstices of badly-fitted work, without proper provision for drainage off water. Can only be solved by a practical examination on the spot).—C. L., Paris.—F. R. F.—T. R. H. (you do not state the exact civil duty, so you are looking at the tide and not the effect of the ventilation under the floor).—J. W.—D. A. (your objections are hardly sufficiently logical to be worth publication).—W. & Co.—E. H. S. (should have sent amount).—B. T. H. S. (too late).—A. R. H. (next week).

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# The Builder.

Vol. LV. No. 2371.

SATURDAY, JULY 14, 1906.

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| House, No. 31, Egerton-gardens, S.W.; Exterior.—Mr. T. H. Smith, Architect                                       | Single-Page Photo-Litho.  |
| No. 31, Egerton-gardens: Interior of Hall, Landing, and Plans.—Mr. T. H. Smith, Architect                        | Double-Page Photo-Litho.  |
| Second Premiated Design, Soldiers' and Sailors' Monument, Indianapolis, U.S.A.—By Mr. Percy G. Stone, A.R.I.B.A. | Double-Page Photo-Litho.  |

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### Early Christian Art in Ireland.\*



MISS MARGARET STOKES, whose researches into the early arts of Ireland are so well known to our readers, not only by her share in the production of Lord Dunraven's

magnificent book on Hibernian architecture, but by many other essays, has rendered a real service to the art student. In the hand-book before us she has brought together a mass of information, the bulk of which, we venture to think, will be new matter to many of her readers. It opens to them evidences of a school of art in many respects different to what is known to them, and the 105 excellent wood engravings with which its pages are enriched team with fresh patterns and designs, very unlike those usually before students. In truth, the art-work of the sister island is of very great beauty, and the study of its progress is one of very considerable interest, heightened as it is by the mystery, if we may so call it, of its rise.

Our authoress, in an introduction and preface all too short for tracing what is known of its commencement, calls attention to the misnaming of the style, and she naturally objects to some of the patterns being called either Anglo-Saxon or Runic. Reference is made to the first wave of culture, which, when it left its parent source in the East and South, was long centuries' before it reached its most western point on the Irish shore. It is in this country, where it last existed, that the largest traces of early elements are to be found. "Such remains really are the only tangible and trustworthy authority for information concerning primitive culture periods elsewhere. If this reflex light which is cast by Northern European monuments upon the history of pre-historic man be interesting, how much more so is that cast by the early Christian customs and arts of Ireland upon early Christian practices elsewhere!" "Thus from the monuments of Ireland the historian of Christian art and architecture may learn something of the works of a time the remains of which have been swept away elsewhere."

Mr. Anderson's remark that neither the history nor the remains of the early Christian period in Scotland can be studied apart from those of Ireland, is the first indication in the pages before us of what is incidentally named elsewhere. We refer to the activity of the early Christian missionaries. As the faith of Ireland spread, so did its school of art. Its presence in Scotland is attested by a vast number of relics of all kinds, of a type similar to what is found in Ireland; the forms of the early churches, where they exist, are similar, and there are two detached round towers, similar to the Irish examples, "stragglers from a great typical group which has its *habitat* in Ireland." The title, "Irish Art," must do, we suppose, until some better one is proposed. Still, it is not sufficiently capacious to include the great group of Christian art works of the early centuries of our era which patient searchers can find within our own borders. Cornwall has many examples, in its early stone crosses, of works which vary but slightly from Irish ones, and the resemblance would, doubtless, have been nearer still had not the hard granite precluded the working of delicate interlaced patterns. Wales has similar works, but of greater beauty, more nearly resembling those of Ireland; the Isle of Man has others varying only in detail; and the Scottish remains, similar as they are, have still several varying details. In England, too, a vast number of remains exist of the same type,—mutilated shafts of crosses covered with interlaced work, inscribed stones, and such like. All these works testify alike to the prevalence of an early style of art over the wide extent of country referred to, and to active inter-communication. We shall see, as we proceed, traces of this activity, not only in the Great Britain of to-day, but over a wide extent of the Low Countries, the Rhine provinces, Switzerland, and even into North Italy. This rests not merely upon indications preserved more or less accurately in the dim histories and traditions of a remote and little-studied period, but on the evidence of existing remains in the places referred to, or in the case of manuscripts known to have come from them.

The book is divided into four sections, namely, Illumination, Metal-work, Sculpture, and Building and Architecture.

Each of these chapters is of interest, and they may as well be dealt with in the order before us, the first being justly assigned to the post of honour, since it is by its manuscripts that the Irish Church is so justly pre-eminent in relation to productions elsewhere. Written

on roughly-prepared skins, much thicker, at least from the seventh to the tenth centuries, than were used in France, sometimes finely polished but more frequently horny and dirty, the writing remains clear and bright, and is likely to remain so. The thick ink is remarkable for its blackness and durability. The red colour, frequently met with, is mixed with a thick varnish or gummy substance which has preserved it alike from sinking into the material and fading. Several colours, such as the yellows, are laid on transparent and very thin, others have a thick body and a strong binding medium.

The extraordinary neatness of the handwriting, and its firm character, has led several English antiquaries to believe that sharp metallic pens were used, but it is shown that only quills were used, obtained from swans, geese, crows, and other birds.

The character is similar to what is found on the oldest Lombardic and Gallic manuscripts, and consists of the minuscule or round hand, and the more angular running hand, the work being of very great beauty and precision. It is in the illuminations adorning these manuscripts so profusely that their great charm consists.

The justly celebrated Book of Kells, that marvellous specimen of early illumination, as might be expected, comes in for full description, and its production is assigned by our authoress to the seventh century. Engravings are given of several of its beautiful initial letters and of a portion of an illuminated monogram, the detail of which is remarkable in every way, indicating as it does a vast number of designs totally unlike one another, and altogether different from any contemporary art from Italian or Byzantine sources. The existence of such a monument as this, away from the great centres of continental thought, must ever be one of the greatest of surprises, not only to the historian but to the art-student.

A beautiful woodcut, the frontispiece of the Epistle of Jerome, called the "Book of Durrow," must be seen to be appreciated. While the ordinary student will see in it a design altogether new to him, the antiquary will recognise a fine specimen of the use of the "trumpet, or divergent spiral" pattern, common on shields and other works of earlier or Romano-British date.

We must not linger over the interesting details rendered on every page, not only of the various celebrated manuscripts which are named, but of notices of their authors, and of

\* Early Christian Art in Ireland. By Margaret Stokes (South Kensington Museum Art Handbook). Small 8vo., pp. 210, with 106 illustrations. London: Chapman & Hall, 1887.



the historical proofs of the early dates assigned to them. At the beginning of the chapter on Irish Scribes on the Continent, our authoress enters upon the consideration of the origin of the Irish style, in which, we think, she hardly does justice to her theme when she says that it seems natural to look to the Romance countries, and to the art in them of the fifth century, as well as to certain Byzantine MSS., for at least the beginnings of Irish Christian art. From these may have come, she thinks, the engrafting of an archaic style upon another of later date, "a style that had died out of Italy and Southern Gaul, but lived on in Ireland to return three centuries later." The phenomenon of the existence of the style which is before us demands all the acumen that can be devoted to it, but a critical examination of its details, we venture to think, hardly justifies the belief expressed.

While we cannot say how this earliest style in Ireland was elaborated, we can say what it is not. In the South of France, after the highly-developed Roman art had fallen with the Roman domination, the same style lingered on for centuries, and is recognised in many a beautiful detail. But there is nothing Roman in Irish art, unless it be the copying, to some small degree, of detail from some ancient pavement or another which could have been met with nearer home. Nor is there anything, or at least much, that is similar to Byzantine,—more than may follow the exercise of the same work by varying people. Gold, and gold backgrounds, so common in such works, are absent in those of Ireland. We could trace, in illustration of our remarks, as much affinity to Chinese design as to Byzantine, but we are not ready to admit that Chinese art had much, if anything, to do with the development of that of Ireland. It is far more probable that the style is the development of the old Celtic art of the people, which was once common alike to all the peoples of these islands prior to the advent of the Romans, to which would be added many developments occasioned by the rule of the latter, which would be common to the Christians of Britain and Ireland alike, for the churches were in constant communication. Added to these influences, there may have been some foreign element introduced with the introduction of Christianity in remote times. Query,—where from?

The style of the continental manuscripts is similar to those still remaining in Ireland, the differences being merely such as we might expect to find in the works of different artists. They are, or were originally, at Bobio, Piedmont; St. Gall, Switzerland; Schaffhausen; Basle; Coire; several places in Bavaria; Vienna; and many places in Germany and Belgium. A curious connexion with the churches of the extreme East is traced in the existence in Ireland and Abyssinia alike of books carried in satchels.

The metal-work consists of a vast quantity of artistic articles, including rude hand-bells, enclosed at a later period in elaborate shrines of metal-work, on which all the skill of the artificers was lavished. Beautiful examples, the Shrine of St. Patrick's Bell and others, the Tara Brooch, various croziers, the cross of Cong, and many others, are figured. They are covered with patterns of interlaced work of very great beauty and elaboration, but it must be remembered that while the patterns are generally similar to those on the MSS., the execution is clearly but a development of the earlier bronze works of Ancient British and Romano-British times. Just as the later style of Scotland is that of Ireland, so the earlier style was common alike to all the British Islands. The development, in fact, of Celtic art metal-work appears not only in Ireland, but in Scandinavia and Denmark, there being many points of resemblance. The remarkable object called the Chalice of Ardagh, alike one of the most beautiful and one of the most ancient communion-cups in the world, is of no little interest, not alone on account of the technicalities of its workmanship, which indicate the most consummate skill, but for its form. It is circular, on a circular base, all being alike covered with minute and elaborate

patterns, partially of gold. It is two-handed, having been evidently intended for communion by clergy and people so long as communion in both kinds was given to the laity.

The shrines for manuscripts came in for elaborate workmanship, many examples of great beauty being given, three of which exhibit great peculiarities. While the case of Molaise's Gospels is ornamented with rather rough borderings, jewelled, and filled in with the evangelistic emblems and interlaced work, the second, the case of the Stowe Missal, is only adorned with a groundwork of diamond or square chequers. The third, the case of Dimma's Book, is varied by the broad panels being filled in with elaborate interlaced strap work, and ornamented by a pattern of diagonal lines.

The chapter devoted to sculpture is interesting reading, especially where reference is given to various interlaced patterns on stone found in or near Rome, which we are inclined to think are exceptional, rather than having relation to the origin of the Irish style. Were this so, we should be likely to find them generally in Roman works, especially in our own country, which is certainly not the case. The large number of crosses and inscribed stones of Christian date in Ireland is large, there being 200 stones inscribed with Ogham characters, 250 tombstones, 7 pillar stones, 4 altar stones, 1 mass stone, 1 quern, and 45 high crosses. These are of varying dates. The inscriptions being mostly in the language of the country, and not Latin, gives them a peculiar interest. The Oghams exist both in Ireland and Wales. The sixth and seventh century stones present a class of bilingual and bilingual inscriptions in Ogham characters with their equivalents in Roman letters. The Irish character is but a localised Roman minuscule, but capitals are rarely found, differing in this respect to the Welsh inscriptions, in which capitals are common.

In Gaul the cursive, derived from the Roman minuscule is very uncommon, but in the museum at Marseilles is a curious marble fragment, brought from Carthage, with a portion of the "Gloria in Excelsis" inscribed upon it in minuscules similar to that on the Irish stones. The high crosses date from the tenth to the thirteenth centuries, the sculptures being in relief.

The ornamentation on the slab stones is incised only, and these stones date from the seventh to the tenth centuries. The opinion of so eminent an authority as our authoress with respect to the age of some of the high crosses, as she terms them, merits all the respect that can be rendered to it; but we venture to think that her remarks relative to the age of some of our English (Northumbrian) crosses, which resemble them to a certain extent, may be more likely to be rendered under misapprehension. Judging by the style of ornamentation alone, the English examples named are likely, we think, to be earlier than the date she assigns to them, while their proportion, far lighter than that of the Irish specimens, points to a different school of design, allied as it was in all essentials. As if to confirm the late date, reference is made to the analogy of the subject on some of the crosses to the "Byzantine Guide," compiled at Mount Athos in the eleventh century, which, we are told, became the text book of Byzantine art. Surely the subjects would become by degrees treated in a uniform manner, and the Guide would only be compiled after they had been so treated for some time, the mode of treatment, in fact, originating the "Guide," which, doubtless, when once compiled, would be followed for subsequent works.

The chapter, all too short, devoted to building and architecture, although less by no means least. It begins with a rapid sketch of the peculiar stone forts or Dúns, which form so peculiar a feature of early Irish building. Their dry stone walling appears again in the earliest oratories raised or the introduction of Christianity, which, in fact, are but enlarged huts constructed after the manner of the "beehive huts," the walls and roofs being alike formed of stonework without mortar, the latter being laid horizontally and gathered over with-

out the introduction of the arch form. Many examples are referred to, and their early date is supported by historical records, several being enclosed within the walls of an earlier Dún, given up to the missionaries by the owner on his embracing Christianity. Some of the earliest settlements or monasteries consist of an enclosing wall, a few circular stone-roofed dwellings, and a rectangular stone-roofed oratory.

The transition from the dry wall and undressed masonry to the cemented walls and dressed stone of the later buildings took place in the sixth and later centuries, the walls at first having been built dry, and the mortar poured over them in a liquid state. The doorways, with sloping jambs, and sometimes with lintels carefully arranged to resist the pressure, appear in early as well as in late examples, showing how regularly the forms once in use continued. Great stones are dovetailed into one another, and archaic-looking masonry is found in conjunction with moulded or cut work, which latter shows very early use of the chisel. The earliest churches consist of a nave only, and whenever a chancel is found in connexion with them, the latter is not bonded into the walls; and there are other signs as well that it is a later addition, the chancel-arch being a plain semicircle, without imposts, in the earliest examples.

As might be supposed, the subject of the Irish round bell-towers is not overlooked. These curious works must have existed in large numbers, since there were 118 remaining at the beginning of the century. The type was not peculiar to the country before the eleventh century. Its existence elsewhere is indicated by the fact that even now twenty-two foreign examples of similar towers may be adduced. "They show a certain development of knowledge in the art of building, similar to what may be traced in the church architecture after the eighth century."

A classification of the various towers is given, divided into first, second, third, and fourth styles, the first being built with rough stones undressed by hammer, the last of masonry analogous to our own wide jointed Norman work, although there are examples of well-dressed ashlar. Reference is given to the alphabetical list in Lord Dunraven's "Notes on Irish Architecture," to which is added the names of the founders of the churches adjoining them, "a precaution only necessary in a country where many still hold these ecclesiastical towers to be of pagan origin." The position was almost invariably about 20 ft. to the north-west end of the church.

The references to early round towers on the Continent are of special interest in proof that these structures were once not confined to Ireland alone; and the notices of the districts attacked by the Norsemen after the year 900 indicate that the districts which suffered most are those in which the greatest number of the round towers are found. The earliest are assigned from A.D. 890 to 927; from 973 to 1013; and some so late as from 1170 to 1238. The little church of St. Caimin of Iniscaltra marks the commencement of the enriched Romanesque style of Ireland, and it dates from the beginning of the eleventh century, or fully fifty years before the Norman style was introduced into England by Edward the Confessor. In Ireland the primitive style had sufficient character and vitality as to modify the incoming style, and to live on, manifesting itself, notwithstanding the fresh forms engrafted upon it. "The style in Ireland of the eleventh and twelfth centuries is an Irish Romanesque style, and the peculiarities by which it is distinguished are native traditions handed down from earlier native buildings."

Many beautiful examples of the work thus described are given, and English readers will find them full of diversities in comparison with our own Norman work. In fact, so great is the difference that they may justly be considered as a separate style. The mouldings are more delicate, the ornamentation smaller and finer, while it covers the surface to a greater extent. The columns to jambs, with their pronounced caps and bases, so common on this



side of the Channel and in Normandy, appear later in Ireland; but in the earlier recessed doorways the angles of the jambs are rounded off, much as we find them in late English examples. Caps and bases are not defined, and in place of the former "the entablature, from which the arches spring, is continued so as to form a kind of horizontal band." "The expression of horizontal extension is still the idea lingering in the mind of the Irish architect, and stamping it with sufficient individuality to give it a place as a distinct variety of primitive Romanesque." The inquiry is one of considerable interest with respect to the introduction of the foreign element of Romanesque work into the country, but our authoress does not enter into it at any length in the little book before us.

Many of our readers will be disappointed that more has not been done in this respect, for it is a subject that has never yet been fully worked out. It appears pretty evident, from the examples the dates of which can be relied upon, that a style whose features were analogous to our Norman work, was being followed earlier in Ireland than in England, and it is more than probable that the zig-zag ornament which appears early in Ireland, is as likely, or more so, to have been derived from the early Celtic period as to have reached the country from Normandy or some other Continental source. Certain it is that, when once introduced, it is found in profusion.

The fronts of the churches have the peculiarity of engaged columns or moulded pilasters at the angles, of which a capital example is given from Roscrea, which has more affinity with French Romanesque than with Norman work. Views of Cormac's Chapel are given, which show a deservedly well-known example of the greatest development of Irish-Norman work, there being many more features of detail in this building common to work in England than is found in other examples. Yet if it be compared, as it may be with advantage, say with the Chapel of St. Joseph of Arimathea at Glastonbury, many points of difference will be apparent at a glance, although the latter building is thirty or forty years later in date. We recommend our readers to make this comparison.

We have now passed in review all the salient points of this little book, which is a mine of wealth to its possessor. Its remarkably cheap price, the number of its engravings, and the suggestive remarks of its learned authoress, are likely to ensure for it an extended sale.

When, in addition to all this, it is considered that the subject matter relates to an interesting and little known branch of art, to which the ordinary student could only previously get access by means of scarce and costly books, its value will be still greater enhanced. While we have thus said enough in its praise, we cannot but think that there is still very ample ground for the further development of the subject, and we hope that our authoress may be induced later to undertake another popular book, a little more full in detail than can fairly be looked for in the Art Handbook before us.

#### SOME NOTES ON CAIRENE ARCHITECTURE.

BY MR. C. S. PALMER.\*

FERGUSON, in his "Handbook of Architecture" (vol. I, page 404), says, in regard to the mosque at Tabreez: "The view of its principal portal will introduce the reader to a new mode of giving expression to portals, which, after the date of this building, is nearly universal in the East." Though adopted throughout the Moslem East, and as fashionable at the present day as ever it was, it is questionable whether the entrances to the grand old tomb mosques in and near Cairo were equalled in any other part of the Mahomedan world. Indeed, though in every style some mode was adopted of accentuating the main and principal subsidiary entrances, the Mahomedan method seems to attain the

magnificence and accentuation aimed at the most perfectly. In Cairo the portals are not only handsome and effective bits of design, but are pieces of construction not excelled in any part of the world, bringing forcibly before the observer what perfect masters of construction the Arabs were, and what a mania they had for cutting away all superfluous material and exhibiting their skill.

In the Cairene style the door is almost always in a recess, and however conveniently-sized the door itself may be, the recess or portal in which it is placed is broad, often deep, and always high. In fact, the height given to the open face of the recess is such as to give all the appearance of an entrance as lofty as the central portion of the building. Having given the portal this great height it must have corresponding width, and if, as in the Persian example at Tabreez (above referred to), it is crowned by a semi-dome, the depth must at least be half the width.

This semi-dome entrance would be grand indeed, but would need great depth, which must have been taken from the building, for the Arab architecture developed in the town of Cairo has flat façades, and the portal is an entrance, not a porch.

In some magnificent tomb mosques, the floor-space required for a semi-dome entrance was given; but in others, notably the smaller ones and in the private houses, the height and breadth were retained, but the depth lessened. This loss of depth was a loss after all only on close inspection; for, with flat façades, and a climate and sun where every shadow is intensely deep, and where gradations of shadow are almost unattainable, a shallow recess looks from a short distance as fine an opening as a deep one.

How to crown the shallow recess constructively and artistically was just such a problem as the Arab, with his great constructive skill and fondness of displaying it to a degree that in many an instance amounts almost to a *four de force*, loved to solve, and solved with a success not excelled anywhere in the Mahomedan world.

Measurements of two solutions of the problem are given below, chosen as much for their intrinsic merit as for their accessibility, and as affording what seemed clues to the construction of the stalactite vaulting and corncoring mentioned further on.

(In the drawings the recess walls are invariably shown in firm lines, the first set of ribs and the horizontal outline attained to by them are shown in dotted lines, the next set in firm lines, and so on. Corresponding lines in plan and elevation can thus be easily traced and connected. Dealing with construction, no thicknesses have been shown.)

Fig. 1 is the plan looking upwards, and fig. 2 the elevation of the crowning portion of a recess in which is placed the entrance to the tomb mosque of Sultan Barkouk (extra-muros).

Here A B B A is the recess, with doorway in the centre of the face B B, and with its lintel below the level of C C, where the recess begins to contract. A trefoil arch, C D E D C, spans the opening in front, having a depth at the lower foils or haunches equal to G A, but in the upper portion only equal to F H; then a semi-dome with centre K and radius K L and springing at M. This semi-dome is intersected by the face L L, and is cast off at the level D D. Over the semi-circle thus obtained is placed the elongated semi-dome D E D or H O Q N O H.

It will be noted that D is the point after which the lower dome would have attained far less height than the breadth it would have covered. This idea of placing one dome on another is not novel, for we see it in St. Sophia at Constantinople; but it is applied in a novel manner, in that a good portion of the lower dome is free, while in St. Sophia all that remains of it are the pendentives.

The height required has now been attained; it remains but to obtain the requisite breadth. On G L is constructed a barrel vault, with its crown at the level of P. This vault intersects the trefoil arch in G O, and the lower semi-dome in L O or M P, and ends against a

vertical face, G L. The corners G B L and the crowning semi-dome are filled with stalactitic work (described hereafter). Next, a barrel-vault, described on L L, intersects the lower semi-dome in L N or M X, leaving of it only the pendentives O L N or P M X. Now the upper semi-dome has for its base (for the convenience and appearance of the stalactitic work) not a semicircle, but the half of a twelve-sided figure, one of the angles falling at Q. So the pendentive is slightly incised to give the appearance of a re-entering intersection L Q or M R.

Not content with the subdivision obtained by intersecting the lower semi-dome with the barrel vault L N L or M X M, the architect has intersected this vault by a plane, and then this plane by a conical vault, such as is shown as a pendentive on plate 16 of the "Domed Churches of Charente," published by the Architectural Association.

The other example, figs. 3 and 4, is from an old house near the Mosque of Sultan Hassan.

Here M N N M is the recess in plan. This has at its outer face (in appearance) the usual trefoil arch M F F M or K D E D K, in appearance only, for the domed portion rests on the segment of a circle, F O G O F. The first example, figs. 1 and 2, is from the tomb of a great king, and depth sufficient was given the recess to obtain a grand arch of depth G A, but this second example is from a private house, and only the few inches, O F, required to give what seemed the necessary appearance of an arch, were grudgingly surrendered.

Next, the lower domical surface is described, with centre B, radius B C, and springing A. This surface is intersected by the recess wall at C C, and, having cut off at the height D D, the upper dome section D E D or F O G is placed on the portion of the circle thus formed. It will be noted here that the radius of the upper dome bears a greater proportion to the lower than in the previous example. This means that the frustum of the lower dome attains greater height for the breadth taken up than in the first example, a desideratum in so shallow a recess.

Next, barrel vaults are raised on N L, L C, and N C with their crowns all at the same height, H D. These vaults intersect the lower domical surface in C O and one another in L P, P C, and P N. A barrel vault described on C C intersects the lower dome in C G, and leaves of it only the pendentives C O G or D A Q.

It will be noted that the thickness of the arch G O F A (in figs. 1 and 2) enables it fully to withstand the thrust of the vault on G L, while in figs. 3 and 4 the thinness of the ring O F necessitated the breaking up of the vaults; the combined thrust of the vaults on C L and N L is very small except at and near their springing, and where there is a great height of wall on the vertical line K H.

The evidence of skilful construction in their examples is plain enough; by what steps it came to be employed on a diminutive and ornamental scale in the construction of stalactite vaulting is not known.

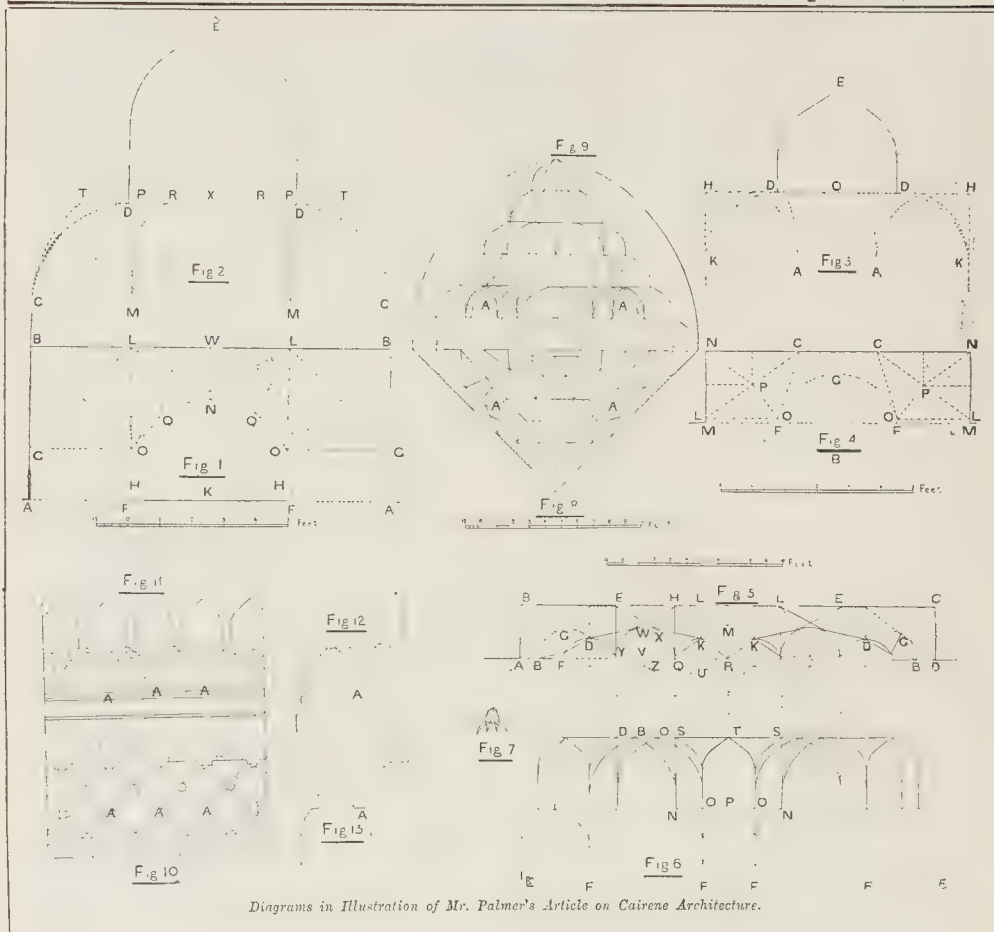
Though the idea is found in other Mahomedan countries, this form of work is a specialité of Egypt and Moorish Spain.

All Indian stalactitic or pigeon-hole work is spasmodic, not constructive, and bears the impress of foreign ideas worked out by skilful native artists to please foreign masters. The work is artistic enough as given in Ferguson's "Handbook," page 428, and Hope and Ferguson's Ahmedabad, but was soon dropped for forms of decoration better understood.

Owen Jones's perseverance and ingenuity have shown us how the Moorish stalactitic ceilings were constructed. Following the general run of their round-headed arches, the Moors made the small domes in their stalactitic ceilings and cornices parts of true spheres, and soon found that some seven different forms or units enabled them to build all they wanted. But, fixing themselves by these units and round-headed equal-sized domes, they lost the variety attained in the Arab cornices and ceilings in Cairo, and perhaps, too, the power of adapting the proportions by means of the

\* Of the Public Works Department, India.





Diagrams in Illustration of Mr. Palmer's Article on Cairene Architecture.

pointed dome and constructional arrangement to the size of the aperture they wished to cover.

No attempt seems to have been made hitherto to draw the Cairene work from measurement and study of its actual construction. It is trusted, therefore, that the few examples here given may be of interest as suggesting the fact that all constructional decoration is copied from previous and often long-established construction. A study of the ceilings of the mosques of Cairo may enable our pointed Gothic architecture to be perhaps better adapted to the short broad churches now deemed best for Protestant services. One very successful adaptation will be noticed later on.

This stalactitic cornice work is used in three positions. First, in pendentives. Here it is usually simple panelling, and consists of so many small surface domes (such as those shown in the example given later), placed row over row, with but small variety. An excellent example can be seen outside Cairo, in the tomb-mosque of Kait Bey. An idea of it can be gathered from the examples of Indian work previously mentioned.

(Where the pendentive is previously broken up constructively, as in the example from El Kubbeh, given by Mr. Grace in a paper read some years ago before the Royal Institute of British Architects, stalactites form the ceiling of one or more of the portions into which the pendentive is broken up.)

Secondly, as coverings to shallow recesses and as cornices. An example of this is given from the Mosque of Kait Bey. The construction is exactly the same whether the cornice is

placed, as here, in a recess, or projecting from a façade, or from the round or polygonal faces of a column or minaret.

Thirdly, as a constructional ceiling to a broad or deep recess; an example of which is also given from the entrance to the Mosque of Sultan Barkouk.

The art does not seem to have been entirely lost in Egypt; for in a fine mosque now being constructed on the site of the old mosque of the Rifaye, there are very good stalactitic ceiled portals, and a cornice from a modern house is one of the examples here given.

Figs. 5, 6, and 7 are from the well-known tomb mosque of Kait Bey, "Extra Muros." Here A B, C D, fig. 5, is the recess. Windows are placed in the face, B C, their tops being well below the line E F E (fig. 6). The problem here was to work from the face B C to the face A D, with three rows of small domical hollows, and to do it in such a manner as would give great play of light and shade.

In a far northern climate the only way really successful would be to have deeply undercut mouldings; but in a southern climate, where every shadow is intensely deep, almost the only play can be between intense light and intense shade; if, therefore, the cornice here were arranged in horizontal lines, all that would be attained would be long lines of light and shadow thoroughly cutting up the cornice, even at long distances; but by breaking up the cornice, as is here done, into small portions, more or less receding and advancing, the whole at a distance shows grey in contact with the bright walls, and only on a closer inspection do the bright and dark surfaces in the cornice become

apparent. But this is just what is wanted; for, when close, only a small portion can be taken in at one time. The Italians effected this by means of brackets in their cornices, but here it is effected still better by the slanting surfaces of the domes, which, by reflection, do produce some gradation of shadow (though it must be confessed it is not very great), which the old Romans only attained at the expense of boring holes in the surfaces between their dentils.

Referring back a moment to figs. 1 and 2, it will be seen that all that is left of the original lower dome are the two pendentives, O L N. Suppose, now, these pendentives are moved round, so that N comes to W, then O L N would be pendentives like those at Sta. Sophia. Looking now at fig. 5, there will be seen these two pendentives placed in juxtaposition as H K L and L K M, or in elevation (fig. 6), as N O F and O F P. Suppose for an instant that the pendentive H K L or N O F is composed of two ribs, H L or N F, and L K or F O, with a curved surface between, and it will at once be apparent how easy it is to adapt it by varying the curvature of the ribs to any position.

For clearness of description turning to the topmost row in this cornice, it is evident that this row is composed of six domical hollows, of which (see plan) four are less than semi-domes, like the crowning portion in figs. 3 and 4, and two are more than semi-domes. The reason for this is apparent,—the shallow domes will always be in less shade than the deep ones. The bases of the shallow domes rest each on the curved space enclosed between a pair of



ribs (above spoken of as a pendentive), as, for instance, the semi-dome, Q K R, in fig. 5, or S U T in fig. 6, on the curved surfaces between the ribs, K Q and Q R in fig. 5, or O S and O T in fig. 6.

These curved ribs, it will be seen, spring from the top of the first course; that is, from K in plan or O in elevation. So far, then, as the shallow domes are concerned, it has been shown how the three courses are formed.

The deeper hollows are divided into a semi-dome, and an arch ring in front (see plan, fig. 5), which latter only appears in the top course, and is neglected in the second course; the semi-dome is divided into three by ribs, Y V, W V, X V, and Q V in fig. 5, or L Z, B Z, O Z, and S Z in fig. 6. Three ribs spring from the top of the second course in a similar way to O S and O T.

It has been explained above that the ribs L K and L M with the curved space between them, form a pendentive. Suppose that this figure L K M (or F O P in elevation) were turned upside down, then it would look like a shell portion of a dome, something like (only shallower than) S U T. Well, the little domes in the lowest and middle rows of this cornice are formed just in this way; thus F P F is a shallow sector of a semi-dome formed by the ribs F P, P F.

To sum up, in this example the recess A B C D (see plan) is transformed into the recess A B C D E H K M K L E D C B D, at the top of the first course, into the recess A F D Y W X Q K R, &c., at the top of the second course, and corners flush with the wall A D at the top of the third.

One point more before passing on to the next example. In the designs submitted in competition for the Liverpool Cathedral was one by Mr. Emerson, the central feature of which was a grand dome.

The interior of this dome was a feature entirely new to Gothic architecture, yet the pointed interlacing arches brought it into perfect assimilation with the rest of the proposed work. Papers have been read before the Royal Institute of British Architects showing how a similar principle was employed in the grand tomb at Bijapur, in India. Fergusson, both in the earlier editions of his "Handbook," and latterly in his history of Indian architecture, writes at length on the Bijapur Dome, but acknowledges he does not know how or whence the idea of these interlacing arches emanated.

The mosque of Kajit Bey, from which this example (figs. 5, 6, and 7) is taken, was built a couple of centuries before the tomb at Bijapur, yet here is seen the same principle used in ornament, see the ribs D W and H W forming one arch, the ribs E X and X K forming another arch, and the semi-arches E Y and H Q intersecting at various points. The miniature sketch (fig. 7), also shows this, and a comparison of this sketch with Fergusson's cut will show that even the treatment of the ribs is identical.

It is certain that the founder of the dynasty that built the tomb at Bijapur came from the West,—was, in fact, a Turk from Constantinople; it is certain, too, that the Mohammedans of India, like all conquering and colonising nations, looked to their old homes as the source whence to draw architectural as well as other inspirations; and as the king who built the great Bijapur tomb was not so many years after the founder as to have rendered it likely that all connexion between the colonists and the old country had ceased, it is most probable that the inspiration for the Bijapur arches came from Egypt. Be this as it may, it may be taken for certain that where one inspiration so well adapted for incorporation into Gothic architecture could be drawn there must be many others well worth studying. The writer saw some fine ceilings in Cairo, but had not the time to draw them. Their principle seemed excellently fitted for incorporation into Gothic work, and it is certain that, as mentioned before, a careful study of their wealth of new ideas would be of advantage to what is at present considered our national ecclesiastical style in its adaptation to the necessities of modern worship.

The next example (figs. 8 and 9) shows how stalactites were built up on constructive ceilings to a recess deep in comparison to its breadth (the third method of use given above). In writing on the entrance to the tomb mosque of Sultan Barkouk, it was mentioned that the crown, viz., semi-dome, as well as the corners G B L (see fig. 2), were filled with stalactitic work. The present examples (figs. 8 and 9) show how this was managed in the corners G B L.

Fig. 8 is the plan, and fig. 9 the elevation, of this corner taken along the line G L in fig. 2. Here there are six courses working gradually up to the upper semi-dome, and the ribs, with the webs between, form sectors of domes with their vertices alternately up and down, otherwise shallow semi-domes; and since, as in shallow pendentives, where the lines of domes and pendentives are long, repetition would be monotonous, variety is obtained by introducing two deep semi-domes in the fourth course (from the top) and working from them. It will be noticed from the plan (fig. 8) that the outlines attained at the tops of the fifth, fourth, and third courses (reckoning from the lowest) are approximately semi-octagons. This was still more evident when looking upwards at the work as it stands. Comparison with other examples when measured and drawn out may give some clue to the rule according to which these courses were laid out.

The last example is fig. 10, and is from the cornice to a modern house in Cairo, in the Sharia Mohammed Ali. It shows that the art still lingers, but, though the idea is still there, its *raison d'être* has been lost, and the broad lines of overhanging cornice are very inferior to what might be termed the uprightness of the old cornices with their alternating light and shadow. It has been introduced here as a simple example of a cornice with real stalactites. These are, of course, A A in fig. 10. This will be more evident from the two sections figs. 12 and 13. Fig. 12 is a section between two of the topmost row of semi-domes, and fig. 13 is a section through the centre of one of the topmost semi-domes.

The domes and pendentives of which these cornices and ceilings are made up seem to have certain definite proportions, varying according to the age of the building; and stalactites seem only to have been used when the recess was so broad that the domical work with these proportions would have had to start inconveniently low.

Referring again to figs. 8 and 9, suppose the plan of the recess (fig. 8) showed a much larger compartment, while the height of the elevation (fig. 9) remained the same, it is obvious (unless the proportions of the ribs, and hence domes and pendentives, were altered) that the only solution of the problem would be some such as follows:—Turn the semi-domes A A into full domes, cutting up the outer or unsupported halves into stalactites (as in figs. 10 and 11), from which fresh ribs might start, thus gaining two additional units of breadth or area, covered without any expenditure of height. This is the simplest method of introducing stalactites. More complex methods, proceeding yet on the same principle, would be, for instance, to turn the small single-course semi-domes A A into domes of two or three courses, instead of only one, as suggested above. With a living art the calculations necessary for these complex methods would be very easy, but the time necessary to draw them out on paper is more than the writer can afford. The construction, of course, in these stalactite pendants, is carried over, and is independent of them, as has been shown to be the case with the pendants in Henry VII.'s Chapel at Westminster.

#### NOTES.

**T**HE Railway and Canal Traffic Bill has not yet been finally disposed of by the Grand Committee, although the last of the original clauses of the Bill have now been reached. The Committee have amended the sub-section dealing with group rates, power being given to the Commissioners, on application being made

to them, to determine whether such grouping does or does not constitute undue preference. There are doubtless cases in which this system is very convenient, at the same time entailing no hardship or injustice, so that it is advisable that the Commissioners should have full discretionary powers in the matter. As a further safeguard against rules which might prove impracticable being made too binding, it was provided that the Commissioners should have power to vary or rescind orders made under this section if, after hearing all persons interested, it should be found desirable. A useful addition was made to the clause dealing with the publication of rates, &c., viz., that the rate-books at ports must state the proportion of any through rate which is appropriated to conveyance by sea, and that appropriated to conveyance by land on either side. The high through rates with Ireland are often quite inexplicable to those who have to pay them, it being generally understood that the proportion which goes to the steamship owners is comparatively insignificant; and such matters may be rendered much clearer by this provision. The canal clauses, which were few and inadequate in former Bills, stand very much as originally drafted. A comprehensive clause has been adopted with regard to the taking over or abandoning of derelict canals, and a sub-section added extending the jurisdiction of the Commissioners as to through rates to parts of rivers which, in connexion with canals, form continuous waterways. An unsuccessful attempt was made to insert an amendment providing that the Great Western Railway shall cease to exercise any management or control of the affairs of the Thames and Severn Navigation. However desirable it may be that waterways should be released from railway control, it does not appear advisable to introduce specified cases into a "general" Act. The motion was negatived as being irregular, but it does not follow that the end desired by the mover may not eventually be attained by other means.

**T**HE following important notice as to the stamping of unstamped or insufficiently stamped instruments has been issued by the Secretary to the Inland Revenue, and builders, contractors, and others should bear it in mind:—

"The Board of Inland Revenue give notice that, except as hereinafter mentioned, they are prepared to remit the penalty or penalties payable on stamping instruments executed prior to the passing of the Customs and Inland Revenue Act, 1888 (16th May, 1888), which are presented to the Board for the purpose at any time before the 1st day of January, 1889.

This concession of course does not extend to instruments which cannot in any case legally be stamped after execution, or which cannot legally be stamped after execution without payment of a fixed statutory penalty, nor is it to apply to instruments in respect of which personal penalties have been incurred or to articles of clerkship.

The Board reserve to themselves the right of refusing the benefit of this concession in any case in which it may appear that the instrument is not voluntarily presented for stamping, but is presented in consequence of other circumstances, such as, for instance, the necessity of producing the instrument in court, or of making good the title to property at the requisition of a purchaser.

In the consideration of applications for relief from penalties payable on stamping instruments executed prior to the passing of the Customs and Inland Revenue Act, 1888, and not presented for the purpose until after the 1st of January next, the Board will have regard to the fact that the liability to the payment of such penalties might have been avoided had advantage been taken of the arrangement hereby notified."

**C**ERTAIN members of the Merchant Taylors' Company have joined with some other gentlemen of repute in forming a Restoration Committee in connexion with St. Helen's Church, Bishopsgate Within. Mr. Wadmore, architect, reports that a sum of over 5,500*l.* should be expended in repair of the fabric, since the walls, roofs, and interior stonework are greatly decayed. He estimates that a renovation of the leaden roofs above the "nuns' choir," the nave, and the transept will alone cost 2,500*l.* Various tenements have been built up against the southern transept and a large portion of the nave walls. In the *Builder* of



March 15th, 1884, we gave a brief account of the church's origin, and of the several brasses, altar-tombs, and mural monuments, dating from the year 1400, which render St. Helen's one of the most interesting of the City churches from an archaeological point of view. At the sale, on the 5th inst., at Christie's, of Lord Londesborough's collection of arms and armour was sold (together with a heaume from Battle Abbey church), "Lot 266, tilting helmet of Sir John Crosby, from St. Helen's Church, London, engraved in Stothard's 'Monumental Effigies.'" A helmet certainly remains in the church, against the jamb of the eastern window above Sir Thomas Gresham's altar-tomb, and that helmet, we are credibly informed, is not claimed as Gresham's. But no helmet is there, as appertaining to the monument of Sir John Crosby and his wife,—he died at Crosby Palace in 1475,—as is shown in the drawing of that tomb, looking northward from St. Mary the Virgin's chapel, by R. W. Billings, and engraved by J. Le Keux for the late George Godwin's "Churches of London," vol. ii. (1839). That altar-tomb is unquestionably Crosby's, though it is described without identification by Hatton (1708) and later writers. The inscription, long defaced, will be found in Weever, and in Godwin's book. On the demolition, in 1874, of St. Martin Oteswich Church, Threadneedle-street, several ancient brasses and monuments were removed therefrom into St. Helen's, including the altar-tomb of John Oteswich and Mary, his wife, (temp. Henry IV.; the brasses of John Brieux, rector (1483), and Nicholas Wotton, rector (1510); the Gothic monument to Alderman Hugh Pemberton and his wife Katharine (1500); and that of Alderman Richard Staper (1608). The two parishes were then united; the joint benefice is now in the gift of the Merchant Taylors' Company. The Capital and Counties Bank stands over the St. Martin's site.

**ANTIQUITIES** of great importance found throughout Greece are now, as we have before noted, as a rule brought to the Central Museum at Athens. To this rule there are, however, many exceptions, and if the archaeologist has dreamed that he could learn all he wished while living in luxury in his Athenian hotel he will be disappointed. It may be well to note some of the exceptions for the guidance of travellers. All the antiquities found in the islands are henceforth to be taken to a museum at Syra; as there is constant communication between this island and Athens this will cause little regret. It is more serious that at Tripolitza a private benefactor is going to build a museum to contain antiquities from Mantinea, Tegea, and neighbouring places. To get to Tripolitza is no low light matter; but a railway is projected from Myli, near Nauplia, to Kalamata, over Tripolitza, and then all will be easy. The inscriptions (in this case a most important element) and larger antiquities found in the Kabeiroi temple are to be left at Thebes. Sparta keeps her only small but very curious collection of antiquities. The owner of Dionosus refuses to part with anything discovered on his land.

**FROM** Athens is reported the discovery on the Acropolis of a large fragment of sculpture in porous stone belonging, undoubtedly, to the group of which the "Triton" head formed a part. The new fragment consists of part of a male torso, to which adheres a fragment of a body with scales. This leaves little doubt that the whole group represented a combat of Herakles with a Triton, conceived, no doubt, after something the same manner as the archaic porous stone pediment. This contest of Herakles and the Triton probably formed, as noted in our "Letter from Athens" [*Builder*, June 30, p. 463], one of a series of compositions representing the labours of Herakles. It becomes a question of increasing interest what was the building, whether precinct, sanctuary, or actual temple, that contained these Herakles sculptures. A Herakleion on the Acropolis is unknown to classical authors. It may still be hoped that further excavations will not only solve the problem of the restoration of the sculpture

fragments, but yield the ground plan at least of the building to which they belonged.

**THE** *Art Journal* for July contains an article by Mr. R. Phené Spiers, accompanied by four illustrations, on the Palaces of the late King of Bavaria. Ludwig II. was one of those wealthy amateurs who are given to indulging their own fancies in architecture, and he appears to have done so with more than usually unfortunate results, and to have got up wonderfully elaborated gewgaw interiors, in which various styles of the past were more or less caricatured, or their worst features emphasised and exaggerated. In short, the late king may be held up as a terrible example to the amateur architect, of whom it may too truly be said that "the evil that he does lives after him."

**WE** may call attention to the intended opening, at the New Gallery in Regent-street, in the autumn, of an "Arts and Crafts Exhibition," which is to consist of art-work exhibited under the name of the actual designer and executant, and not of firms, though the name of the employer or firm of employers may also be given. The work to be exhibited will be classed under the twelve following heads:—"Textiles," "Gold and Silversmiths' Work, including Enamelling," "Metal and Iron Work," "Fictiles," "Decorative Painting," "Wall Papers," "Bookbinding," "Printing," "Glass," "Stained Glass," "Wood and Stone Carving," and "Cabinet Making." Detailed information can be obtained from the Secretary, Mr. Ernest Radford, at the New Gallery.

**WE** have perhaps enough and to spare by this time of "Dictionaries of Antiquities." Setting aside English books, there is from the French the great work of Daremberg & Saglio; from the Germans, Baumeister's "Denkmäler"; and in the special department of mythology, Roscher's Lexicon; but we cannot pass unnoticed the issue of the first number of an archaeological dictionary in Greek by a Greek. Mr. Rangabé, whose work in connexion with Greek archaeology is sufficiently well known, has just published the first part of his "Λεξικὸν τῆς Ἑλληνικῆς Ἀρχαιολογίας." It is scarcely fair, perhaps, to judge a lexicon that has so far only reached A; but though we hail its issue as an evidence that there must be a considerable Greek reading public interested in archaeology, we are bound to say the text is thin, and suffers from what is, alas! nowadays, a Greek characteristic,—vagueness,—and the woodcuts are miserable beyond description.

**RELATIVE** to the projected celebration, at Twickenham, of the 300th anniversary of Pope's birth (May 22, 1688), we may remind our readers that his riverside house there was bought by Sir William Stanhope, who enlarged the house and its grounds, and from him passed to his son-in-law, Welbore Ellis, elevated Lord Mendip on August 13th, 1794. Lord Mendip jealously protected every relic of the poet, but failed to preserve the willow tree from its final decay in 1801. On his lordship's death, in 1802, the house was sold to Sir John Briscoe, Bart. After Sir John's death, on December 27, 1806, it was purchased by Sophia, eldest daughter of the famous Lord Howe, who had succeeded to her father's barony of Howe, of Langar, at his death, on August 5th, 1799. Lady Howe shortly after caused the house to be pulled down and replaced by another residence close by the original site. The garden and grounds, about five acres in all, were at the same time dug up. Pope's "Egerian grot, where, nobly pensive, St. John sat and thought," forms a passage under the main road from Brentford to Teddington and Kingston,—"a place of silence and retreat," says Dr. Johnson, "from which he endeavoured to persuade his friends and himself that cares and passions could be excluded." Pope's gardener, John Serle, published a pamphlet, with a plan of the garden as it appeared at his master's death, a view of the grotto, a catalogue of its ores and spars and stones, and the names of those, including Hans Sloane, Dr. Borlase, and Mr. Richard Owen Cambridge, who had contributed specimens.

Dodsley's "Cave of Pope" foreshadowed subsequent curiosity and pilferings. The copy of the Homer used for the translation, and owned by Walpole,—who, by the way, did not go to Strawberry-hill until three years after Pope's death,—contained a sketch by the poet of the view from the grotto, including the church, eyot, and part of the village. His fame, and, what is more, a competency, having been assured by his version of the Iliad and "The Rape of the Lock," Pope had purchased a life interest in this property, and either he removed with his mother, Edith, after a short sojourn in Mawson-row, olim Mawson's-buildings, Chiswick, where his father died in 1717. At Twickenham he passed the latter twenty-five years of "that long disease, his life," and there he died, his humanity surviving his understanding, in the evening of May 30th, 1744. His memorial in St. Mary's Church was erected by Bishop Warburton, in 1761, and is inscribed with the poet's own line:—"For one who would not be buried in Westminster Abbey."

**THE** last volume of the "Architectural Association Sketch-book" exhibits a new feature in the introduction of a certain number of coloured plates among the rest. The annual volume, the seventh of the new series, which has just been sent us, is fully up to the average of past volumes in the usefulness and artistic character of the plates, and that is saying everything for it. Of course there are some sketches not so good as the rest, and possibly there are a few that we could have done very well without, but certainly the number of such is much smaller than in most other architectural sketch-books. It is surprising that this publication, appealing, as it must do, to the tastes of every architect and architect's assistant in the kingdom, does not attract more than a little over two hundred subscribers. It is not as if the subscription were a large one,—it is only a guinea for seventy-two reproductions of first-rate sketches and drawings of old buildings or parts of buildings, and outsiders are asked to pay no more than members. The sketches are of every class and kind, and even the term "old buildings" is accepted in its widest sense, so the wonder is that any architectural designer who cares to see what has been done in the past can afford to be without it. The present volume is enriched by reproductions of sketches by at least three of the oldest contributors to the book, Mr. R. P. Spiers, Mr. H. W. Lonsdale, and the late Fred. Deshon. But do so few of the original contributors to the book, who are still living, now use their blocks and sketching stools? We do not want them all back: the exchange of some of them for younger men is no loss, but it would be very pleasant to see the names of Mr. Ernest Lee, Mr. E. J. May, Mr. George Vials, and a few others we could name, once more in the index. However, the quality of the work, taken all round, is constantly gaining both in style and in correctness, and the accession of such sketchers as Mr. G. Horsley, Mr. Bidlake, and some half-dozen others, may well console us. The most successful transferred sketch in the volume is without doubt Mr. Bidlake's South-east Transept of Lincoln Minster; it would be easy to find fault with the drawing of some of the window-heads, but in touch, style, relief, and grouping it is well in front of the other drawings of the same kind. The interior view of Elm Church, Cambridgeshire, by Mr. A. Needham Wilson, is a slight, delicate, and eminently workmanlike and useful sketch. All the criticism we can suggest is that it might have been even more useful with a few notes of details or dimensions. The sketches at Haarlem, Leyden, and Middleburg, by Mr. L. Ambler, if a trifle hard, are good specimens of careful, conscientious work, and very suggestive to designers of street fronts. Among the sketches reproduced by photographic processes are several so good that it is difficult to say that any is better than the rest, but if we had to choose we should probably be content with the marble pulpit from San Miniato, by Mr. Gerald Horsley, from what was evi-



dently a clear and powerful pencil drawing of a very rich and beautiful piece of work. The Campanile of the Duomo, Prato, by Mr. E. G. Hardy, and the Priory Church, Great Malvern, by Mr. H. D. Walton, are equally good illustrations, in different styles of drawing, of equally beautiful subjects in just as different styles of architecture. The illustrations of *Le Manoir D'Ango*, by Mr. W. J. N. Millard, are poor reproductions of clever sketches. The volume is exceptionally strong in facsimiles of drawings to scale, and first among such must be mentioned the complete set, with mouldings and carvings delicately and beautifully drawn on four sheets, of the tomb of Giles de Bridport in Salisbury Cathedral, by Mr. G. G. Wallace. The drawings of Tilty Parish Church, Essex, by Mr. Arnold B. Mitchell, are, perhaps, the best piece of drawing Mr. Mitchell has done. We should like to comment on the illustrations by Messrs. Gotth. Marvin, Onkeshott, and others, but space only allows the expression of a hope that the delicate reproductions of Messrs. Lonsdale, Selby, and Robertson's coloured sketches will meet with the appreciation they deserve.

THE Sulgrave estate, in the south of Northamptonshire, will be put up for sale at the Mart on August 7th next. This property extends over 220 acres, whereof more than one half is grass land. The old manor house, distant about eight miles from Banbury and Brackley, was formerly the home of the Washingtons. At the Dissolution, Henry VIII. gave some property here, held by the Augustinian priory at Canons Ashby (*vide the Builder*, August 8 and 15, 1885), to a Lawrence Washington, of Gray's-Inn, and mayor of Northampton in 1532 and 1545. In the aisle of St. James's parish church is a brass in memory of him, his wife Aimée Pargiter, and their eleven children, 1564. His two sons, Lawrence and Robert, sold their inheritance. Lawrence, who died in 1616, was father to John, a royalist, who, in 1657, emigrated to Virginia, where he settled as a planter. His lineal descendant, George Washington, was born, on February 22nd, 1732, in the family homestead at Bridge's Creek, in County Westmoreland, in that State. It may not be commonly known that the first President of the United States, yielding at the last moment to his mother's entreaties, forfeited a commission which had been obtained for him in the King's navy, and for three or four years after leaving school supported himself as a land surveyor. His first employment in that capacity was for Thomas, sixth Lord Fairfax, who had inherited from his mother the Northern Neck, a tract of over 5,500,000 acres, lying between the Rappahannock and Potomac rivers. It is supposed that the "stars and stripes" of the American flag are derived from the mullets and bars that compose the coat-arms of Washington. One of the two carved shields in the porch at Sulgrave bears that blazon.

THE last number (1888.—I.) of the American *Journal of Archaeology* contains an article by Mr. S. B. P. Trowbridge, architect to the American School at Athens, on the "Archaic Ionic Capitals found on the Acropolis." These capitals, Mr. Trowbridge shows, illustrate the intermediate steps between the earliest known Greek form, as represented by the capital found by Mr. Clarke on Mount Chigri in the Troad, and the later familiar examples such as the capitals of the Nike Temple and the inner columns of the Propylæa. The columns discussed are three, and form three successive steps, following, as Mr. Trowbridge thinks, a perfectly simple and natural progression. In the Chigri capital the volutes spring vertically from the shaft of the column; in the mature form they are connected by an undulating horizontal band. In the Chigri capital the palmette springs from the centre, and is an important feature; in the mature column it disappears, and the abacus takes the form of a separate block; in the Chigri capital there is no echinus and bead moulding such as appears in the mature form to mark the junction of capital and column. In the Chigri

capital the volutes project very far, and the ratio of width to depth is more than three to one, in the mature capital it is about three to two. The gradual transition is very clearly seen in the three Acropolis capitals, of which Mr. Trowbridge gives woodcuts. In the first the volutes still spring vertically, but are joined by horizontal bands: the anthemion is much reduced by the presence of the abacus; in the second the volutes spring horizontally, but are not yet joined: the anthemion is reduced to some scraps of ornament, and the projecting echinus appears. In the third the volutes are continuous, and the anthemion has wholly disappeared; the echinus is retained as an ornamental feature, but the reduction of the diameter of the column makes it no longer a structural necessity. Mr. Trowbridge gives also two drawings from vases at Athens which show still further intermediate steps.

THE same number of the *Journal* contains the account, with a plate, of a bust of Plato, hitherto unpublished. It is of great interest in connexion with the Berlin bust, of which it will be remembered we published a reproduction some time ago. The newly-discovered bust, found at Smyrna and bought by M. Reinach for the Louvre, shows just the same type of features, and is, therefore, an additional confirmation, and it happens to be the only one certainly known to have been found on Hellenic soil. The *Journal* also contains an interesting article on an engraved bronze bull, seen by Mr. Emerson in the Museum at Metaponto. This bull is a curious and possibly unique piece of work; the design has been drawn on a bronze plate and afterwards sawn out, so as to form a silhouette. It probably formed a votive offering, to be hung upon the shrine of Apollo Lykeios, near at hand. The type of the bull is interesting because it is closely analogous to the well-known butting bull of the coins of Thurium.

IT is to be regretted that Mr. Hebb, in his examination before the Board of Works Inquiry Commission, should have persisted in maintaining that there was no impropriety, and nothing to reflect on his official and professional character, in the systematic use of his official position to induce managers of theatres to give him seats. Every one who knew anything of Mr. Hebb would feel quite sure that he would never have abused his position by accepting or looking out for commissions or bribes in money, nor do we believe that he allowed the presentation of orders for theatre seats to interfere with the proper performance of his duties as inspector; but that he should profess to see no impropriety and no reflection on his character in the letters to Mr. Harris for seats, and the broad hints that it was in the writer's power to make things uncomfortable to a manager, is really extraordinary. Even apart from the question of official position, we should have said that any man with the feelings and education of a gentleman would rather never enter a theatre at all than get in by persistent begging for "orders"; but when the person doing so is in the position of being responsible to the public for the proper observance of certain legal regulations in the theatres, what would otherwise only be chargeable as bad taste and want of self-respect assumes a much more serious aspect. When this theatrical correspondence was first made public we avoided saying much about it, because if we had referred to it at all we must have spoken very strongly, and we thought Mr. Hebb had suffered enough in the way of public comment. But when Mr. Hebb professes impotence and unconsciousness of any impropriety, we must, in the interests of the architectural profession, speak our opinion plainly. Mr. Hebb is, as he urged to the Commission, not a mere business surveyor like Robertson and Goddard, but a cultivated man and an architect of ability and standing, and as such he was the more bound to remember what was due to his position and to the character and dignity of the profession of which he is a member.

#### A FEW NOTES ON QUEEN ELEANOR'S CROSSES.

THE *Daily News* of May 28th last announced that "the task of restoring the beautiful Eleanor Memorial Cross at Waltham, under the direction of Mr. Harry Hems, of Exeter, is progressing in a fashion which will rejoice the hearts of all who prize this precious relic of the past." We further read that, *teste* Mr. Tydeman, Hon. Secretary to the Restoration Committee, whereas the soft Bath stone which was used (by Mr. W. B. Clarke, architect) for the repairs of 1834 has proved to be entirely unfit to stand exposure for any length of time, the old Caen stonework is found to be sound and good, and will not be touched. Ketton stone has been chosen to replace the inferior and modern material. In a letter printed in our contemporary of June 1, Mr. Hems states that, whilst he is employed as sculptor, the work is being done by him under the direction of Mr. C. E. Ponting, architect to the Committee.

Conspicuous amongst the royal tombs which range around St. Edward the Confessor's shrine at West Minister are those of our greatest English-born sovereign and his devoted wife, Eleanor of Castille. Here Edward of Westminster had erected splendid monuments to the memory of his uncle Richard, Earl of Cornwall, his father, and his first wife. Hither sixteen years after Eleanor's death, his own remains were brought, on October 27, 1307, from Burgh on Solway Sands, where he was planning the completion of that series of conquests which earned for him the title of Hammer of the Scots. His body had been carried to London from its temporary resting-place by a hallowed grave, named as that of Harold Infelix, in what had been the monastery founded by Knut's standard-bearer, Toni, at Waltham Holy Cross. And at Waltham had rested the body of Eleanor on its way to burial in St. Edward's Chapel, nearly over against the later beautiful doorway, "*Sanctus Erasmus*," which opens from the ambulatory into the chapel of St. John the Baptist. Her tomb\* is built of freestone and grey marble, with panels bearing the now almost obliterated arms of Leon, Ponthoë in Fonthieu, Castille, and England. It is distinguished by a sloping grille, which is believed to be but the relic of a larger screen. That valuable specimen of foliated work, of wrought iron, riveted, and in detail Early English, was at one time (1822) taken down and thrown, with a quantity of other fashioned metal, into the St. Blaise Chapel. Dean Buckland caused it to be replaced, when it was further repaired under the direction of Sir G. Gilbert Scott. In an article which we printed, with a wood-cut, several years since,† we stated that the grille was wrought by Thomas de Leghton, smith, at Leighton Buzzard, for the price of 13*l.*, and that Richard (father or brother to Roger) de Crundale, who also first worked upon the Charing cross, carved the tomb. John de Ware and William Sprot, of London, founders, furnished metal for the effigy, whereof a wax model was first prepared. We added that Thomas de Hockington, carpenter, made a canopy which formerly lay above the effigy, and that this canopy was painted by Master Walter de Durham, painter, who executed also the paintings on side of the tomb. Authorities do not agree as to whose handiwork is the bronze-gilded figure. In his paper read in Henry VII.'s chapel on July 19th, 1866, the late Sir Richard Westmacott says: "It is known that Pietro Cavallini was employed by Edward I. in execution of this tomb [Henry III.'s] as well as that of Queen Eleanor. . . . The monument [Queen Eleanor's] immediately adjoining that of Henry III. merits attention for the extraordinary elegance and beauty displayed in some of its details. . . . The figure, of bronze gilt, is recumbent, habited in the royal costume. There is a calm, gentle expression in the face, which is extremely touching, and the hands especially are designed with the utmost grace." He then cites the opinion of Flaxman and other competent judges to the effect that foreign sculptors were employed on this with many of the more important works in our country, and says that Flaxman thought the name of Torelli, goldsmith, which occurs in a document of the time, should be

\* See Mr. W. H. Bidlake's drawing, from the east, in the *Builder* of July 31, 1886.

† See *Builder*, December 9, 1854. The engraving then given shows the tomb from the west.

‡ To the London Congress of the Archaeological Institute of Great Britain and Ireland.



written Torelli. He observes that "goldsmith" may possibly refer to only the gilding of the metal figure, which may easily have been done by an Englishman. To Torelli, or William Torelli, the entire effigy, together with that of Henry III., has been attributed, by amongst others, Sir G. Gilbert Scott in his "Gleanings from Westminster Abbey," 1861. We see therein the features, singularly placid and impressive, of one whom her sorrowing consort wrote to her friend the Abbot of Clugny that he loved tenderly in her lifetime and did not cease to love now that she had died.

Queen Eleanor died on St. Andrew's eve, November 29, 1291, in the house of one Richard de Weston at Herdrey, the modern Harby, a Nottinghamshire village, on the borders of Lincolnshire, and distant seven miles from Lincoln Minster. The site of the house was taken for that of All Saints' Church: built, 1375-6. Here, at the eastern end of the former church, Edward I. established a chantry, *in piam memoriam*, which remained until the Reformation. The queen's body having been embalmed, her bowels were left at Lincoln; her heart and body were taken southwards,—the former for deposit within the sanctified precincts of Blackfriars. Thus set forth one of the most memorable progresses in our domestic history. Its point of departure, Herdrey, and its several halting-places, to the number of thirteen or fourteen in all, were distinguished by the subsequent erection of memorials which have long lingered in remembrance as the crosses of the beloved queen. Since the lists of these crosses which are set forth in the various text books do not correspond, we will name all those that are chronicled: namely, at Herdrey, Lincoln, Newark-on-Trent, Grantham, Stamford, Geddington, Northampton (Hardingsstone), Stony Stratford, Woburn, Dunstable, St. Alban's, Waltham, West Ham (doubtful), West Cheap, and by St. Katharine's Hermitage in the fields at Charing. For the last two named, Magister Michael de Cantuari, conciliaris, was the mason employed. The subsequent history of these has been so often rehearsed, together with the fanciful derivation of Charing from Chère Reine, that it will suffice to say the West Cheap cross was finally demolished by a set of fanatics on May 2, 1643; and that the cross at Charing suffered a like fate in the summer of 1647. The copy of the cross that stands before the South Eastern Railway terminus was set up in 1863, after Mr. E. M. Barry's designs. The sculptured work was done by Mr. Thomas Earp. We would suggest its removal to one of the refuges by King Charles I.'s statue at Charing Cross, where it could be better seen, and would occupy a site very near to that of its original.

Of the three Eleanor crosses yet extant, two are in Northamptonshire,—at Geddington, on the high road between Stamford and Kettering; and in the parish of Hardingstone, on the southern outskirts of Northampton. This latter stands just north-east of an eminence, formerly surmounted by a circular earthwork, four acres in extent, which is supposed to have been made by Knut's father, Swegen. The cross is fairly perfect, having been repaired in 1713 and 1762. It is similar in respect of its decoration and general shape to that at Waltham, yet is somewhat different in plan, being octagonal. The Geddington memorial stands in the midst of the village, rising to a height of 40 ft. It is richly carved in every part, and bears the coat of arms of Castille, Ponthoise of Ponthien, and Leon. At the top are three queens in the act of lamentation. The third, or Waltham, cross is situated at the junction of the main road to Ware and Cambridge and the road which branches off towards Enfield Chase. The plan is hexagonal, the design consisting of three stories, supported by a flight of steps, four in number. The first and third stories are solid, their sides spaced into divisions which carry statues, and the shields charged with the various arms associated with the queen. The second story has two open recesses in each face, covering the six statues within. The whole work was richly decorated with foliage, quatrefoils, lions' heads, pinnacles, and the like; but these adornments, together with the statues, have suffered much by neglect and the course of time. Owing to sundry encroachments, the steps gradually disappeared, and, according to a view made in 1757, had been replaced with flat courses of brickwork. The fabric on more than one occasion occupied the attention of the Society

of Antiquaries, and about one hundred years ago it was in contemplation to remove it bodily to Theobalds, for better security. Certain houses, the Falcon Inn in particular, had been erected in such close proximity as to block up one side of the cross, whilst the inn actually abutted against it. The Falcon was lately purchased by Sir Henry Menz, Bart., in order to clear away so much thereof as should liberate the cross from disfigurement and danger in that quarter. The old Four Swans hostelry, across the road, is claimed to date from the year 1260, yet it is manifestly a successor to, rather than the original of, the manor-house wherein the queen's bier was deposited on the eve of the day which saw its entry into London. For some particulars as to this cross's later history we are indebted to an article by Mr. W. Dampier, in "Walford's Antiquarian," of November, 1885. There, moreover, we read that the cross, as finished in 1294, at the then heavy cost of 95*l.*, is believed to have been built by Roger de Crundale, aided by Dominique de Leger of Rheims, and Alexander of Abington, after Pietro Cavallini's design. To William de Ireland is ascribed the carving of the statues of the queen, wherein she is represented as crowned, holding a cordon in her left hand and a sceptre in her right. See also Mr. Walford's "Greater London," vol. i., p. 392.

#### PROFESSOR ROSCOE'S REPORTS ON THE DEODORISATION OF THE LONDON SEWAGE.

SIR,—Herewith I send you, for publication, copies made by me at the Kensington Vestry of Sir Henry Roscoe's Reports to the Metropolitan Board of Works on the Deodorisation of the London Sewage in the Sewers and at the Outfalls. As these Reports, I believe, have not yet been communicated to the Press, and in view of their great importance, I trust you may be able to find room for them.

Yours obediently,

CHARLES HANCOCK, F.R.S.

Temple, July 9th, 1888.

No. 1.—Preliminary Report of May 16th, 1887, on the Deodorisation of Sewage in the Metropolitan sewers.

To the Clerk of the Metropolitan Board of Works.

64, Queen's Gate, S.W.: May 16th, 1887.

SIR,—I have read through the pamphlets and other documents forwarded by you on March 30th, with reference to the question submitted to me as to the use of chemicals for the purpose of disinfecting the emanations from the sewers under the Board's control, and situated in various parts of the metropolis. I have also inspected the Pimlico pumping station, with special reference to the employment of a mixture of manganate of soda and sulphuric acid for the purpose of destroying the smell from the sewers, and I witnessed the application of the same as carried out at that place. I have, moreover, read over the list of complaints about smells furnished me by Sir Joseph Bazalgette. It appears that the number of complaints were as follows:—in 1883, 64 complaints; in 1884, 3; in 1885, 41; in 1886, 23. The employment of manganate was commenced in 1885. Hence a decrease of something over half the complaints has followed the use of manganate. The cost of chemicals thus employed, from May 17th to September 30th, 1886, amounted to 33,325*l.*, exclusive of labour, so that I may put the annual cost of this mode of deodorising the sewer emanations to the extent carried out at (say) 10,000*l.*

The questions (as I understand) addressed to me are the—

(1.) Does the manganate deodorisation process effect the required end?

(2.) Is the result attained by the use of the manganate commensurate with the cost incurred?

(3.) Is there any cheaper and equally efficacious process which can be adopted for the same end?

As to Question 1, I am of opinion that the manganate process does effect a certain deodorisation of the sewer emanations. I judge that this is so from my own observations, and from the fact that the complaints of smells have diminished from about sixty-five to about thirty since the employment of the method. So far, however, as the chemistry of the process is concerned, I agree with the conclusion arrived at by Mr. E. Rider Cook, and printed in a pamphlet dated December 18th, 1886,—i.e., I am of opinion that the quantity of manganate used in the sewers cannot affect the nature of the sewage at the outfall, and also that although, undoubtedly, there is a considerable diminution of the smell when the manganate is used, the quantity added is quite insufficient to oxidise even a small part of the putrescent fecal matter which gives rise to the emanations.

As regards the second of these questions, I

cannot (after much deliberation) bring myself to consider that an expenditure of over 40,000*l.* a year is commensurate with the results obtained. No medical evidence has, so far as I know, been brought forward to show that illness,—much less that any outbreak of an epidemic,—has been traced to the sewer emanations complained of. So that, in order to diminish to one-half sixty-five complaints of bad smell, the Board have spent more than 40,000*l.* per annum.

As to the third question, I should wish to point out that, if it be determined to disinfect the sewers at all, it may prove possible to do so as effectually, and more cheaply, by the use of other chemicals than manganate of soda and sulphuric acid. Thus, e.g., bleaching-powder and sulphurous acid would be cheaper and probably as efficacious as the manganate; and I am not aware that the disinfecting power of these substances on the sewer emanations has been satisfactorily tested by the Board. I would therefore suggest that full experiments with these two disinfectants should be made, either in place of, or in addition to, the manganate for the purpose of comparison. I propose to report again, and more fully, when the matter has been further investigated. Meanwhile, I do not consider that the expenditure of the manganate deodorisation process is justifiable.—Yours truly,

(Signed) H. E. ROSCOE.

Preliminary Report of June 10th, 1887, on same Subject.

To the Clerk of the Metropolitan Board of Works.

SIR,—In reply to your letters of the 28th of May and 2nd of June, in which you express the Committee's desire that I should give an opinion as to the quantities and respective proportions in which bleaching powder and sulphurous acid should be used in the sewers, I have to make the following statement:—

(1.) In the observations contained in my preliminary report of May 16th, when suggesting that experiments should be made with the above-named chemicals, I did not intend to indicate that these should be applied to all the twenty-six stations mentioned in the report of your Engineer and Chemist of October 18th last, but rather that a few of these stations,—viz., those near to the localities where complaints had recently been made, should be selected for this purpose.

(2.) I understand, from the reports placed in my hands, that experiments on deodorisation by means of sulphuric acid were carried out some years ago under the late Mr. Keates (in 1870-71), and that these experiments had been so far successful. I also find that similarly successful experiments were carried out with chlorine gas (probably, bleaching-powder solution) in 1873. I have not been able to ascertain why these experiments, which appear to have cost only 100*l.*, were discontinued, and I have come to the conclusion that they should at once be recommenced.

(3.) I do not feel myself able to give the precise quantities either of sulphurous acid or of bleaching solution which ought to be used at each of the experimental stations. This must depend upon the amount of sewer emanations passing up into the air, and can, therefore, only be ascertained by experiments made on the spot. The method formerly adopted, of dropping the solution on to a cloth suspended in the ventilating shaft, appears to be likely to prove effective.

(4.) In making the above suggestions, I especially desire to point out that the object which, in my opinion, is to be aimed at is simply to deodorise the sewer emanations, and NOT to disinfect the sewage itself; and I may be also allowed to add that by far the most effective method of accomplishing this is, wherever practicable, to dilute the sewer emanations with fresh air by means of suitable ventilation.—Yours truly,

(Signed) H. E. ROSCOE.

No. 2.—Preliminary Report, being Report of August 7th, 1887, on the Deodorisation of Sewage at the Outfalls.

To the Clerk of the Metropolitan Board of Works.

64, Queen's Gate, August 7th, 1887.

DEAR SIR,—In accordance with the request of the Board, dated June 27th, that I should state the results of a month's trial of deodorisation at the outfalls with chloride of lime (bleaching powder), I beg to report as follows:—

A stock of bleaching-powder was delivered at Crossness on July 2nd, enabling operations to be begun; whereas, at Barking, a further delay of four days took place, owing to non-delivery. At both stations a beginning was made at the rate of three grains of bleaching-powder per gallon of sewage, this being the number of grains equal in oxidising power to five grains of manganate, the average quantity of this substance previously employed. At this rate the total quantity of chloride of lime added amounts to about 17 tons per day at Barking, and to rather more than 13 tons per day at Crossness. This treatment was continued, with a day or two's interruption owing to the stock running out, until the afternoon of July 23rd at Barking, and on July 26th at Crossness, at which time enough stock was on hand to render it possible to add a quantity sufficient entirely to deodorise the effluent, namely, about five grains per gallon at each station.



Since the above dates the process of complete deodorisation has continued without interruption up to now, and this will be carried on until the stock of sewage is exhausted, at about the end of the first week in September.

The Board is aware that, owing to the reconstruction of the Barking reservoir, a quantity of the sewage, amounting (according to Sir J. Bazalgette's estimate) to about one-sixteenth of the whole quantity discharged into the river, has to be sent out during the flood-tides. This portion, however, is subjected, as regards deodorisation, to a similar treatment to that which is sent out during the ebb, and thus the risk of annoyance from this source is minimised.

But, in order to attempt to effect a local purification of the river above the outfall, I have thought it advisable, considering the exceptional state of the weather, to make the experiment referred to in my note to the Board of the 2nd inst., and on Friday, Saturday, and Sunday last the addition of manganese in the Deptford sewer has been carried out, 140 tons of 25 per cent. manganese having been added. I trust that the effect of this addition will be salutary in that portion of the river.

In reply to the letter of the Engineer and Chemist, dated July 29th, forwarded by you on August 3rd, on the subject of the deodorisation at the outfalls, I have to say I consider the experiment of using chloride of lime for the deodorisation will have continued long enough to enable me to judge of its efficacy. I would, therefore, advise the Board not to purchase any further quantity of this material, but to give an order for the purchase of enough manganese and sulphuric acid to be employed after the date on which the bleach is expected to be finished, namely, from September 3rd to September 10th, for a period long enough for me to form an estimate of the relative value of the two materials. The quantities named by the Engineer and Chemist would, in my opinion, be sufficient. I wish further to add that, in my opinion, the daily analysis of the Thames water as made by the Chemist should be regularly continued, as it is only by a systematic determination of the chemical conditions of the water that a true conclusion can be arrived at as to the action of the deodorants. I am also of opinion that it would be advisable, if possible, for the Board to obtain daily returns of the quantity of fresh water passing Teddington Lock.

I am carrying out other experiments with a view to ascertain more exactly the relative value of the two deodorants, and shall report to the Board again when the experiment with the manganese is completed.

Should the temperature become lower and the rainfall continuous during the recess, and should the condition of the river be thereby improved, I would advise the Board to order the diminution, or discontinuance, of the addition of the deodorants.—Yours truly,

(Signed) H. E. ROSCOE.

Report dated March 3rd, 1888, on Deodorisation of Sewer Emanations.

To the Chairman of the Metropolitan Board of Works.

MY LORD,—In continuation of my reports on the above matter, May 16th and June 10th last, I have to state that, continuing the use of sulphurous acid for deodorising the sewer emanations, have now been carried on for a sufficient length of time to enable me to judge to some extent of the efficacy of the process. The deodorising material has been applied at over 196 different stations in the Metropolitan area. A list of these is appended. One hundred-and-ninety-four consist of stoneware jars filled with a gallon of saturated aqueous solution of sulphurous acid, which drops upon tianel, while two are glass bottles containing anhydrous acid, under a pressure of four atmospheres, which is allowed to escape slowly through a minute aperture.

The annual cost of the materials and maintenance of these is estimated by Sir J. Bazalgette to be about 11s. to 12s. per station, or at 3,500s. for the number hitherto at work.

It is difficult at present to give a definite opinion as to the chemical effects of the sulphurous acid on the emanations, but it would appear that the offensive smell from the sewers is diminished by the use of sulphurous acid, as I am informed that the complaints have been less numerous from the occupation of houses in the vicinity of the shafts in which the deodorant had been placed than was the case previously.

So far, therefore, the results of the experiments have been satisfactory. It is, however, to be borne in mind that these experiments have been conducted during the cold months of the year, and that the process has yet to go through the ordeal of summer temperature. It is not until this has been done that a complete proof of the efficacy or otherwise of the method can be obtained.

I beg, therefore, to recommend the Board to continue this system during the spring and summer months, careful record being kept of as well the working and cost as of the complaints made in the neighbourhood of the stations where the deodoriser is used.

I append a letter from Sir Joseph Bazalgette, together with a list of stations referred to.—Yours faithfully,

(Signed) H. E. ROSCOE.

#### DEODORISATION OF THE SEWAGE AT THE OUTFALLS.

[THE following is Professor Roscoe's Report of December 9th, 1887, on the Deodorisation of the Sewage at the Outfalls.]

MY LORD,—On August 7th last I reported to the Board the results obtained up to that date with reference to the deodorisation of the Metropolitan Sewage at the outfalls. I then advised that the experiments with bleaching powder should be followed by similar ones with manganese of soda, and I stated that other experiments were being conducted by me for the purpose of arriving at a conclusion respecting the relative action of these two deodorants. The experiments on a large scale, first with bleaching powder and afterwards with manganese of soda and sulphuric acid, were duly carried out, and the further ones are now sufficiently complete to enable me to report on the results as a whole.

I desire, however, to state that, looking to the great importance and complexity of the subject, and bearing in mind that no standard investigations exist to which reference can be made, I do not consider that this report is final, many questions of importance having arisen during the investigation which require further careful examination.

Before entering into the details of the main question submitted to me by the Board,—viz., the relative value of the two deodorants,—employed during the last summer at the outfalls,—I beg to express my strong conviction that the use of chemicals of any kind must be considered as a temporary measure, sanctioned solely by conditions of time and of place; that is to say, that considering the present position of the Outfalls, the arrangements now existing there, and the conditions arising from drought and high temperature during the summer months, I am of opinion that the addition of some deodorant to the effluent sewage may be advisable. I conceive, however, that the question would assume a different aspect should these conditions be altered, and that then the necessity for such addition might decrease or even disappear.

In considering the question of deodorants, it appears advisable first to form a clear idea of the principles upon which such deodorants act, as well as to understand the subsequent changes which the sewage undergoes, after such treatment, in its passage into, and in its admixture with, the water of the river.

It may, to begin with, be assumed that no amount of chemicals which can, with any show of reason, be added, is sufficient, or nearly sufficient, to convert the whole of the fecal matter into harmless forms. Hence the use of chemicals can only be recommended for the purpose either of starting a process of purification, or of simply getting rid of the evil odour.

The purification of the river, in which the sewage may remain for some length of time, must, therefore, be effected by natural processes. Of these, by far the most important is the change produced by living organisms. The change thus carried on may be of a two-fold character; the one, due to the action of organisms requiring free oxygen for their growth, has the result of rendering the organic matter inoffensive; the other, due to organisms which flourish in the absence of free oxygen, gives rise to products which are offensive.

It is therefore clear that efforts should be made to preserve and assist the life of such organisms as are capable of effecting this innocuous change, and to prevent the growth of such as yield offensive products.

The oxygen necessary for the growth of what may be termed the "healthy" organisms is usually derived from the air dissolved in all unpolluted running water. Sewage, however, is either entirely free from, or at any rate contains less dissolved oxygen than is necessary for the active growth of these healthy organisms.

In consequence of the absence of dissolved oxygen in the sewage, this has, during its passage to the outfall, already begun to undergo change of a putrescent character, owing to the growth of the putrefactive or "unhealthy" organisms.

The products of this putrefactive change readily absorb free oxygen passing into more stable forms, and therefore when the sewage is poured into the river it rapidly robs the water of its dissolved oxygen. If, now, the quantity of sewage thus poured in exceeds a certain proportion as compared with the river or fresh

water, the whole of the river is deprived of its dissolved oxygen, and the "healthy" growths are thus practically killed.

Hence the addition of deodorants has for its object the destruction by chemical oxidation of the putrescent material which not only causes the foul smell, but effects the removal of the free oxygen from the water of the river. The deodorisation is, however, only the first step in the process of purification; and, in order that growths necessary for the production of healthy change may flourish, the deodorised sewage must be brought into contact with the free dissolved oxygen needed for the respiration of the organisms.

This, under proper conditions, is obtained from the larger volume of unpolluted water with which the sewage is mixed. But should the river water either be insufficient in quantity, or have lost its oxygen by previous pollution, then the whole volume of water, after mixing with the sewage, becomes incapable of supporting the life of the "healthy" organisms, and no further addition of an oxidising chemical can ever restore the river to its normal condition. The only natural remedy then remaining is the slow absorption of atmospheric oxygen at the surface of the water.

It is thus seen that the chemical oxidation or deodorisation of the sewage is only a means to an end, that end being the presence of a sufficient quantity of free dissolved oxygen.

Hence it remains to consider whether that same end cannot be brought about by different means. Such, for example, might be the aeration of the sewage before entering the river.

Reserving the consideration of this point, I now proceed to discuss the action of each of the two deodorants used, viz., the bleaching powder and manganese of soda acidified with sulphuric acid.

In my former report of August 7th, I stated that the relative oxidising power of these two chemicals was that three grains of bleaching powder were equal to five grains of manganese. To this I still adhere, with the reservation that the chemical value of the manganese is somewhat overstated.

For the purpose of ascertaining which of the two chemicals is the more efficacious and safe to employ, irrespective of cost, experiments on the large scale had to be carried out. The following is a short description of what was done:—

#### Experiment with Bleaching Powder.

From about July 2nd up to August 26th bleaching powder was mixed with the effluent sewage at both the outfalls. Owing to dearth of material at Barking, the sewage at the Northern Outfall was not deodorised until July 20th, and for the same reason some few days occurred at both stations when no chemicals could be applied. The quantity used varied at first from 2½ to 5 grains per gallon of sewage; this continued for about a week. Then the rate was altered to 3 grains per gallon, lasting for about a fortnight; and then, for about five weeks, a rate of about 5 grains per gallon was employed, the quantity being varied somewhat according to the condition of the sewage.

The actual weights of bleaching powder added daily during the eight weeks' trial are appended. (Table I., p. 16.)

At the beginning of this experiment the river was in an extremely foul state. No attempts had been made during the spring or early summer to improve its condition by artificial means. The rainfall from January up to the beginning of July amounted only to 7½ inches, whilst during the subsequent eight weeks the rainfall only reached 2½ inches.

Hence the experiment was commenced under very unfavourable circumstances.

The daily routine for testing the efficacy of the process of deodorisation was as follows:—Samples of the effluent to which the specified quantity of bleaching powder had been added were tested by the small every hour, or sometimes more frequently, during one of the two daily discharges. If the sample appeared not to be completely deodorised, the quantity of bleaching powder needed for perfect deodorisation was ascertained. Evidence was thus obtained as to the actual daily condition of the deodorisation; and although, owing to the varying condition of the sewage, an occasional sample was observed to be over or under deodorised, it was found that, on the whole, the putrescent odour of the sewage was effectually destroyed by the bleaching powder throughout



the whole period. (For details of observations at Crossness from July 19th to August 27th, see Appendix A, page 14.)

The average daily quantity, used at the rate of three grains per gallon, reckoned on the average volume of dry-weather sewage at 156,800 gallons, would be at Barking about 17 tons, and at Crossness about 13 tons of bleaching powder.

Although from the foregoing there can be no doubt that bleaching powder does act as a good deodorant, it is difficult to come to a satisfactory conclusion as regards its effect on the general character of the river, because, beyond occasional inspection and the daily tests as to the composition of the river water carried out at Crossness, there are no definite means available for measuring this effect. Inspection is at least an uncertain and indefinite criterion, and it, like the results of river analyses, is subject to the influence of changes brought about by undetermined, and perhaps undeterminable, causes, such as variation in the tides, wind, rain, &c.; moreover, the constantly diminishing volume of fresh water in the river during last July and August, and the constantly varying temperature, bring in factors whose influence it is impossible to determine.

The general impression which I have, however, formed, taking those circumstances as well as I could into consideration, is that although no adverse decision can be given, it is certainly not possible to express my favourable opinion as to the action of the bleaching powder added upon the general condition of the river.

Such being the position, it only remained to exclude these complicated and uncertain conditions by carrying out a careful series of laboratory experiments on the action of bleaching powder on sewage. I propose to describe these experiments and discuss their results, together with similar experiments on manganate, in a subsequent portion of this report.

#### Experiment with Manganate.

Having completed the investigation of the action of bleaching powder on the large scale, I resolved to commence a similar experiment with manganate of soda and sulphuric acid. The daily routine of ascertaining whether the deodorisation was satisfactory was similar to that already described. The experiment lasted from the evening tide on August 27th, to the 5th of October. The proportions of manganate added were 15 grains per gallon of sewage for three days; 10 grains per gallon for three days; and 5 grains for a period of twenty-three days; and lastly, 3 grains for about ten days.

Ten grains of manganate corresponds in oxidising power to the 5 grains of bleaching powder used during the greater part of the former experiments, and this quantity of manganate would therefore be required to effect perfect deodorisation, on the supposition that the composition of the sewage remained the same as it was during the experiment with bleaching powder. This supposition, however, turned out not to be correct, as during the last few days of August and the first week in September two inches of rain fell, whilst at the same time the temperature of the river decreased, so that 5 grains of manganate per gallon was found to be sufficient to deodorise the sewage flowing out during September and the first week in October. This difference is also partly due to the fact that the action of bleaching powder is much slower than that of manganate, and that, therefore, more bleach must be added to effect immediate deodorisation than is equivalent to the manganate needed to produce the same effect. (For detail of experiments on this point, see Appendix B, p. 15.)

The changes of condition occurred immediately after the commencement of this experiment; and from this time forward the state of the river was markedly improved.

The daily quantities of manganate used during this experiment are appended (Table II, p. 17).

In this case, as in the former one, I am not able to estimate definitely the effect of the deodorants on the general state of the river, though the general impression which I have formed is that the manganate does not act prejudicially.

Referring once more to the means of ascertaining the state of the river, I desire again to emphasise my opinion that the quantity of dissolved oxygen may be taken as indicating the "healthy" condition of the water. The amount

of this oxygen, as taken from the Crossness analyses made by Mr. Dibdin, varies from 90 per cent. of the possible maximum down to none.

From the curves (A) appended to this report for the years 1885-6-7 it will be seen (the black line denoting oxygen) that during the early and the late months of the year the amount of dissolved oxygen is at its height, whilst a rapid fall occurs at the beginning of July, lasting till October, when a slow rise occurs, this becoming rapid in December. Concurrently with these changes, corresponding changes are noticed in the volume of fresh water coming into the river, as indicated by the quantity of sea salt (red curve) present in the river at low tide. The other curves give temperature (blue), and the vertical dotted lines the rainfall. The more valuable data of the quantities of fresh water passing over Teddington locks do not seem to be obtainable. Daily rainfall registers for 1885-6-7 are also appended on pages 20-1-2, and the amount of rainfall is indicated on the curves (A) by a dotted red line.

Comparing the general aspect of the curves for the three years, plainly shown in the second series of curves (B), it does not appear that those for 1887 show any material indications of a worse state of things than those for the two previous years. And it may well be doubted from any evidence obtainable from the above sources whether the state of the river in 1886, when upwards of 80,000l. was spent in chemicals, was perceptibly better than that in 1887, when 42,000l. was spent, or even better than that in 1885, when only 29,000l. was spent in deodorants (see returns of quantities appended, Nos. 1 and 2, pages 18 and 19). Indeed, the idea forces itself on one's mind that either the effects of the chemicals are imperceptible, or that the methods of measuring those effects are imperfect.

I am, however, strongly of opinion that accurate oxygen determinations do give a reliable measure of the "healthy" condition of the river; but I am not convinced that the present methods of analysis are satisfactory, and I think that this question needs re-investigation.

#### Laboratory Experiments.

Experiments made in the laboratory appeared to be the only means left for obtaining more definite information as to the important question whether, and if so how far, each of the two deodorants used affect the life of the "healthy" organisms upon which the natural processes of sewage purification mainly depend.

The intricate and difficult character of an investigation of this kind scarcely requires comment. Before commencing the inquiry I, therefore, thought it desirable to obtain the opinion of a well-known microscopist as to the nature and functions of the organisms occurring in sewage. Professor H. Marshall Ward, of the Royal Indian College, has been good enough to report to me on this subject, and to examine some of the samples of treated sewage microscopically.

It appears that at present our knowledge of the character and properties of the active organisms contained in sewage is very incomplete, and that a thorough investigation of the subject would entail the expenditure of much time and labour. So far as observations on the material placed before him enabled him to judge, Professor Ward concluded that the sewage which had been treated with bleaching powder contained, in common with that treated with manganate (both liquids being allowed to stand for some length of time in partially closed vessels), lower forms of life in quantity, but that the higher forms, such as algae, were conspicuous by their absence in the first, and by their presence in the second case.

This conclusion, I may remark, was borne out by subsequent microscopic experiments next to be described, made under my own superintendence, with carefully sterilised vessels, as well as by the simple inspection of the liquids, which were allowed to stand for some weeks exposed to the action of light and air.

Although the functions of the numerous kinds of growths present in sewage cannot as yet be satisfactorily distinguished, I am of opinion that the results of experiments already obtained are sufficiently conclusive to enable me to answer the question addressed to me in a fairly satisfactory manner.

The first series of experiments on the effects of the two chemicals on the living organisms contained in the sewage was carried out at

Crossness, the remainder in Manchester. They consisted in the observation, extending over a considerable number of days, of samples of sewage to which known quantities of the two deodorants had been added.

The microscopic examination had for its aim the determination of the quantity and quality of the growths as existing in the liquid from time to time.

The result of these experiments, most of which were made with carefully sterilised vessels, is (1) that a quantity of bleaching powder, equal to 9 grains per gallon, completely and permanently stops the growth of all organisms visible under a high power; (2) that smaller doses, amounting to say 3 grains per gallon, appear for a considerable time to exert an equally powerful effect; (3) that the addition of 1 grain, though interfering with the growth of certain organisms, seems scarcely to affect the growth of others. Further experiments were made with the view of ascertaining the action of bleaching powder on the life of higher organisms, such as minnows. It was found that water containing 1 grain per gallon killed such fish in two hours, that containing 3 grains in one hour, and 4 grains in half an hour. Smaller quantities, down to 4 grain per gallon, also exerted a similar effect, but in a longer time. I am not able to report on the action of still smaller quantities than the above.

It is important here to notice that the action of bleaching powder on sewage differs from that of manganate, inasmuch as, whilst the latter is immediately destroyed, the former disappears but slowly, it being possible to detect it some days after its addition, even when originally present in small quantities only. For details of experiments on this point, see Appendix B, on page 15.

Hence, the action of the bleaching powder on the organisms is one lasting over a considerable period of time, and its effect upon the river is greater than it would have been if its action had been instantaneous.

With regard to the effect produced upon life by the addition of manganate of soda to the sewage, experiment showed—(1) That neutral permanganate of soda added to sewage in quantities amounting to 9 grains per gallon, whilst it does not prevent, appears to retard the growth of organisms; (2) that smaller doses, from 1 to 3 grains, produce no visible effects, and, therefore, do not act as poisons. In corroboration of this, it was found that minnows will live for some days in fresh water to which one grain of permanganate has been added, and smaller doses do not seem to affect the fish in any way, whilst a dose of 2 grains per gallon does not prove fatal until after the lapse of twelve hours. It is to be remembered that one grain of permanganate per gallon in fresh water gives a pink solution, showing the presence of the undecomposed salt, whereas if sewage had been used the permanganate would have been instantly destroyed, even if added in very much larger quantity.

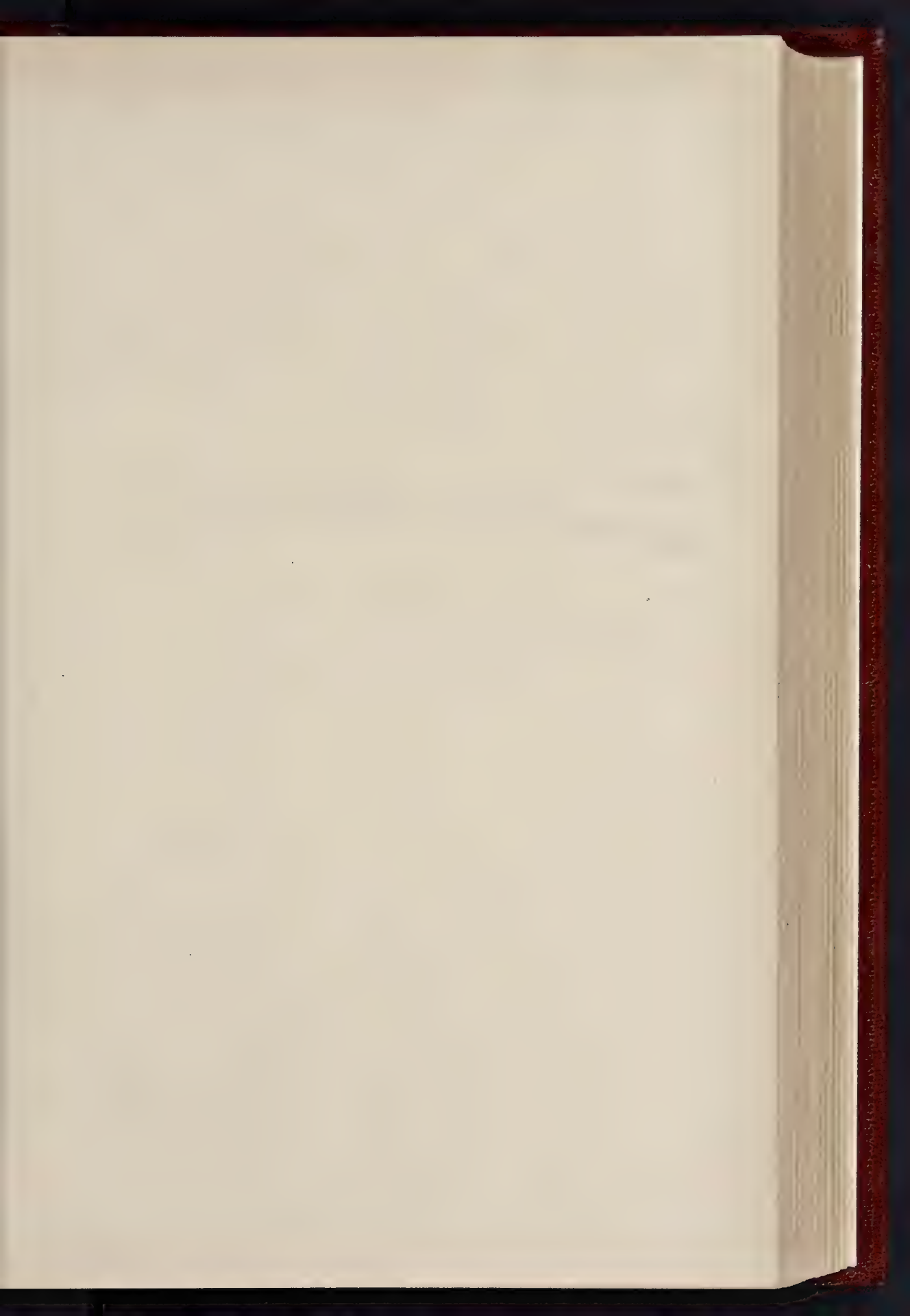
Hence the conclusion is to be drawn that, apart from the consideration of cost, manganate is to be preferred as a deodorant to bleaching powder.

The important question, to what extent, if any, the use of deodorants effects a radical improvement in the river, is one to which, as has been stated, it is not possible with the present evidence to give any decisive answer. In the absence of further evidence and of any more satisfactory means of dealing with the evil than the chemical one, I should advise the addition of manganate in moderate quantity, say about 3 grains per gallon, during such periods of the year as the dissolved oxygen falls below (say) 20 per cent. of the possible maximum, or the chlorine exceeds 200 grains per gallon, both analyses being made on low-water samples.

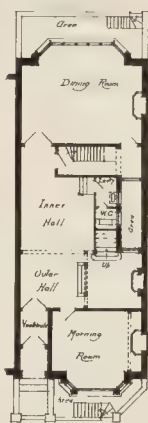
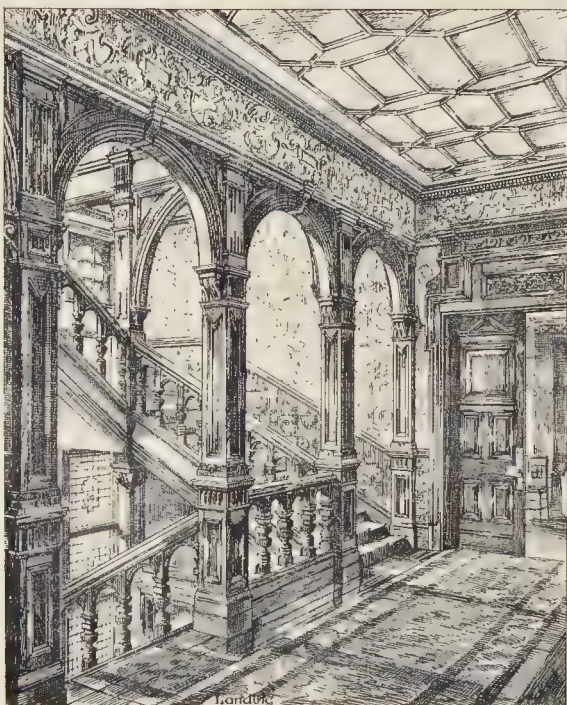
On this estimate,—the data as regards the probable necessary duration of the addition of chemicals being taken from the curves appended,—the average annual cost of manganate is estimated to be about 40,000l. I may add that the cost of sulphuric acid has not been taken into account, the advantages of its use being, in my opinion, more than doubtful. This point requires further working out, and it is to be borne in mind that even this outlay will not prevent a foul condition of the river occurring during the summer months, in droughts or during hot weather.

It next has to be considered whether any more satisfactory or less costly means can be









Ground Floor Plan.



1st Floor Plan.



2nd Floor Plan.





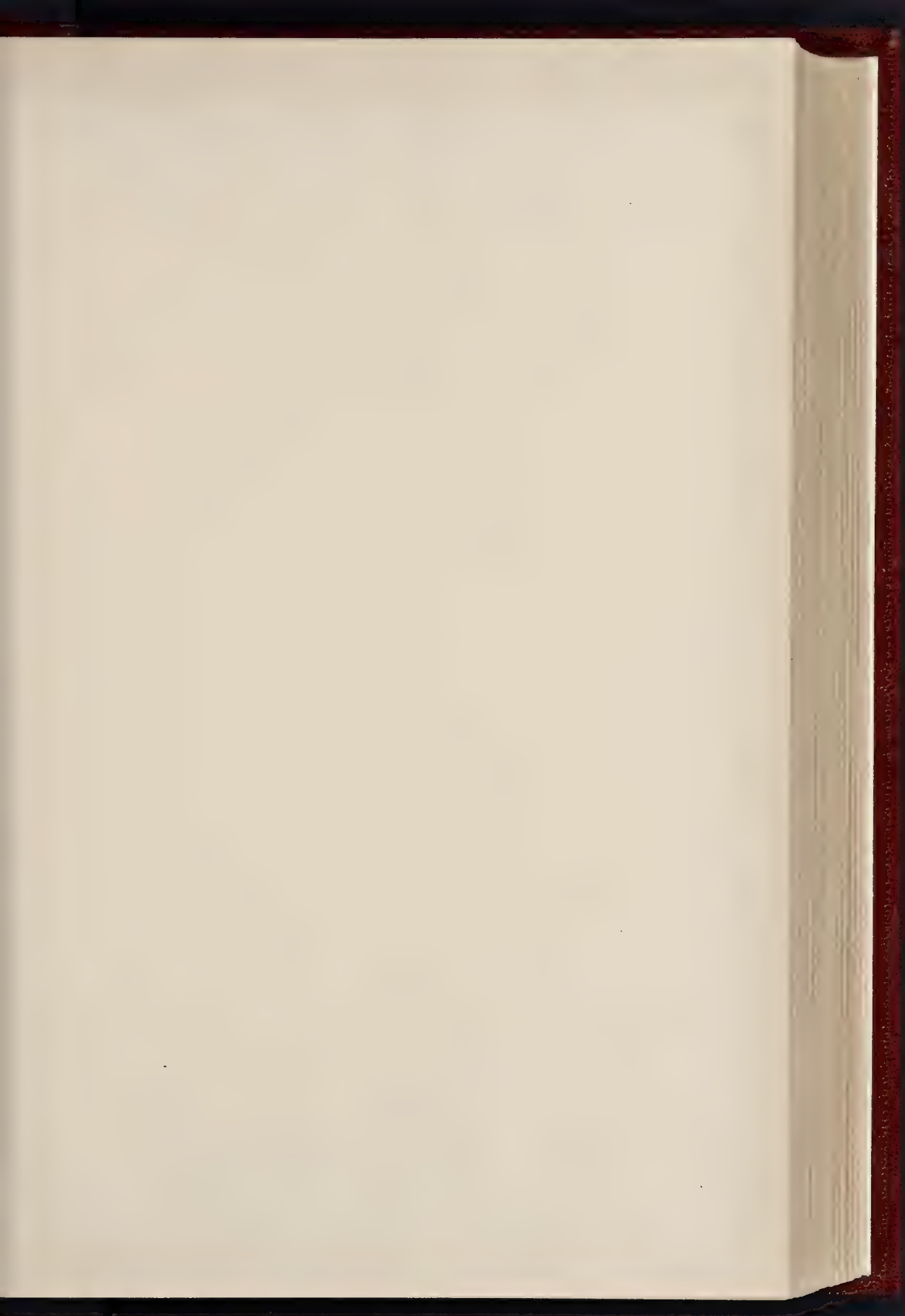


31 Egerton Gardens  
*Interior of Hall.* S.W.  
for W. Whitherty Esq<sup>re</sup>  
T.H. Smith Archt.





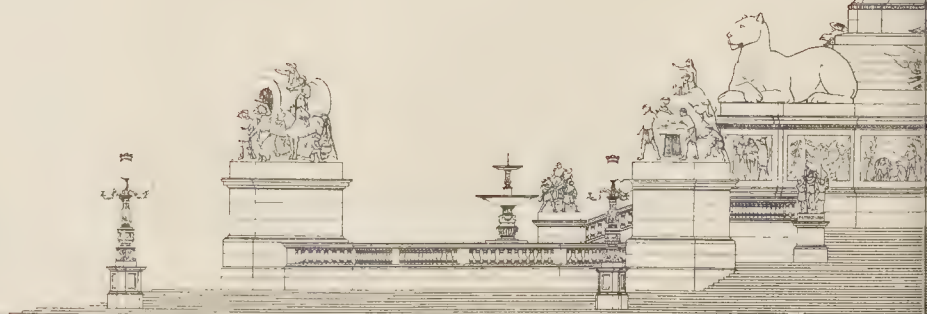






SECOND PREMIAED DESIGN  
FOR  
THE SOLDIERS AND SAILOR MONUMENT  
FOR THE STATE OF INDIANA  
INDIANAPOLIS  
U.S.A.

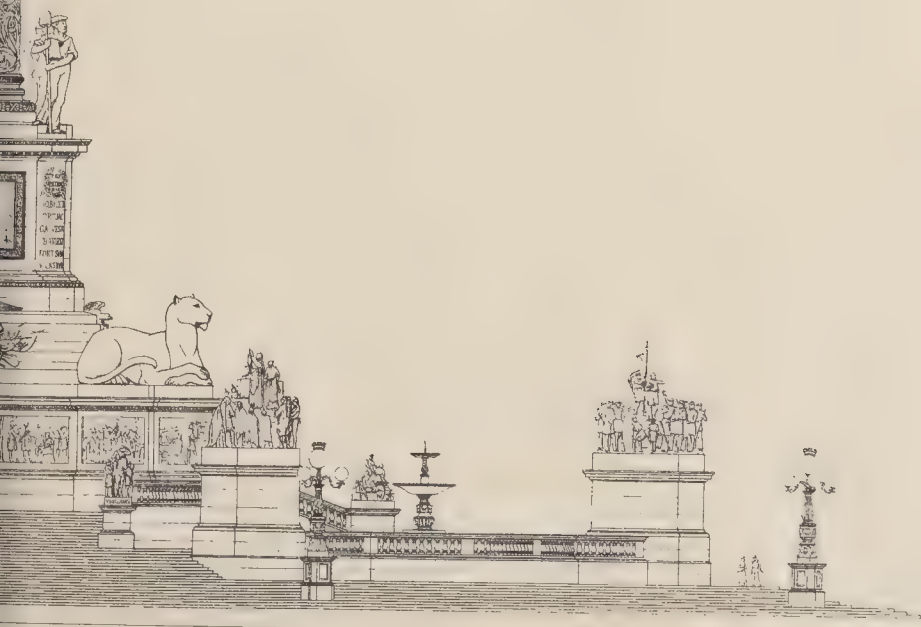
BY MR PERCY G. STONE A.R.B.A.



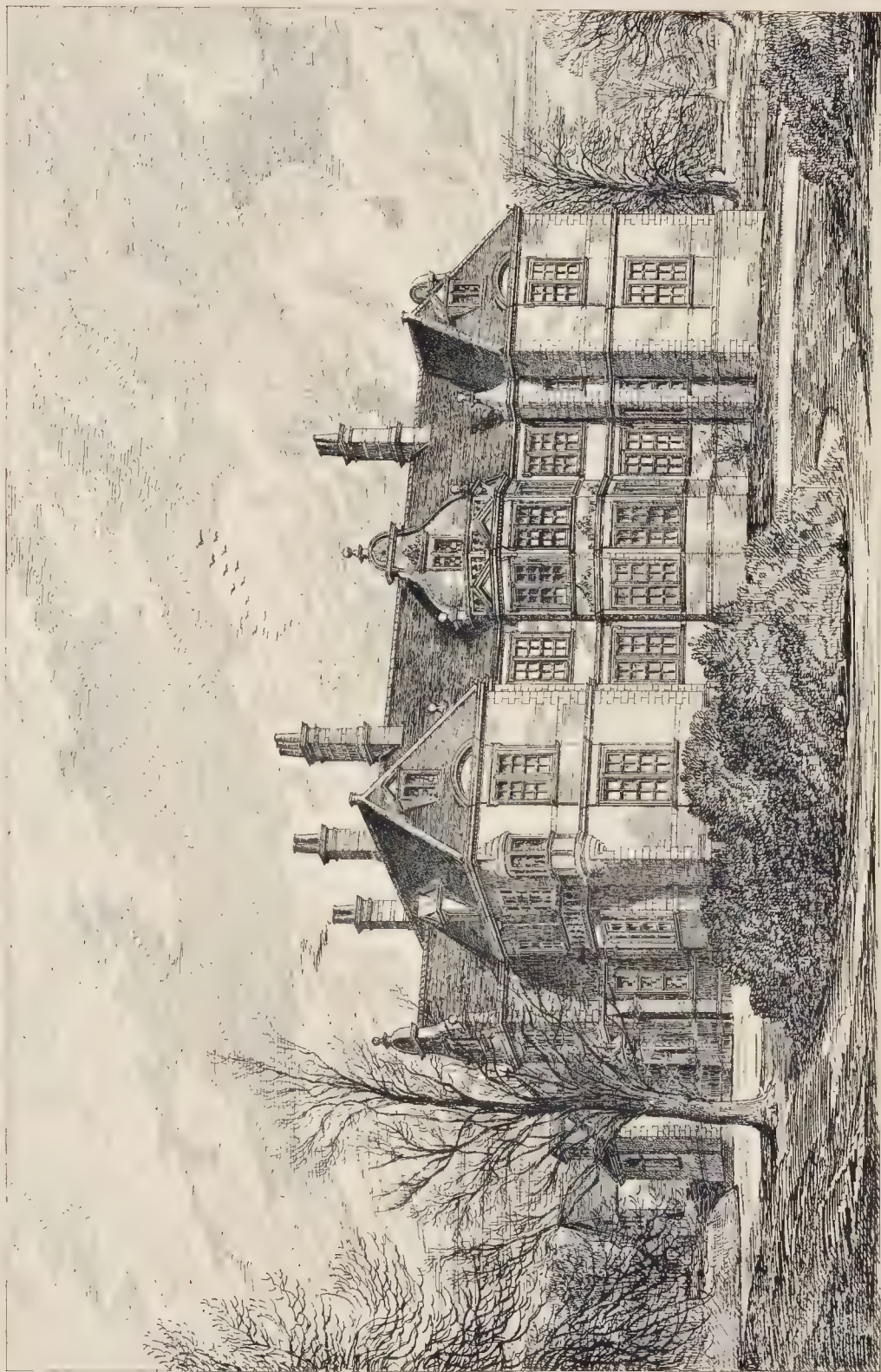




PLAN



THE BUILDER, JULY 14, 1886.



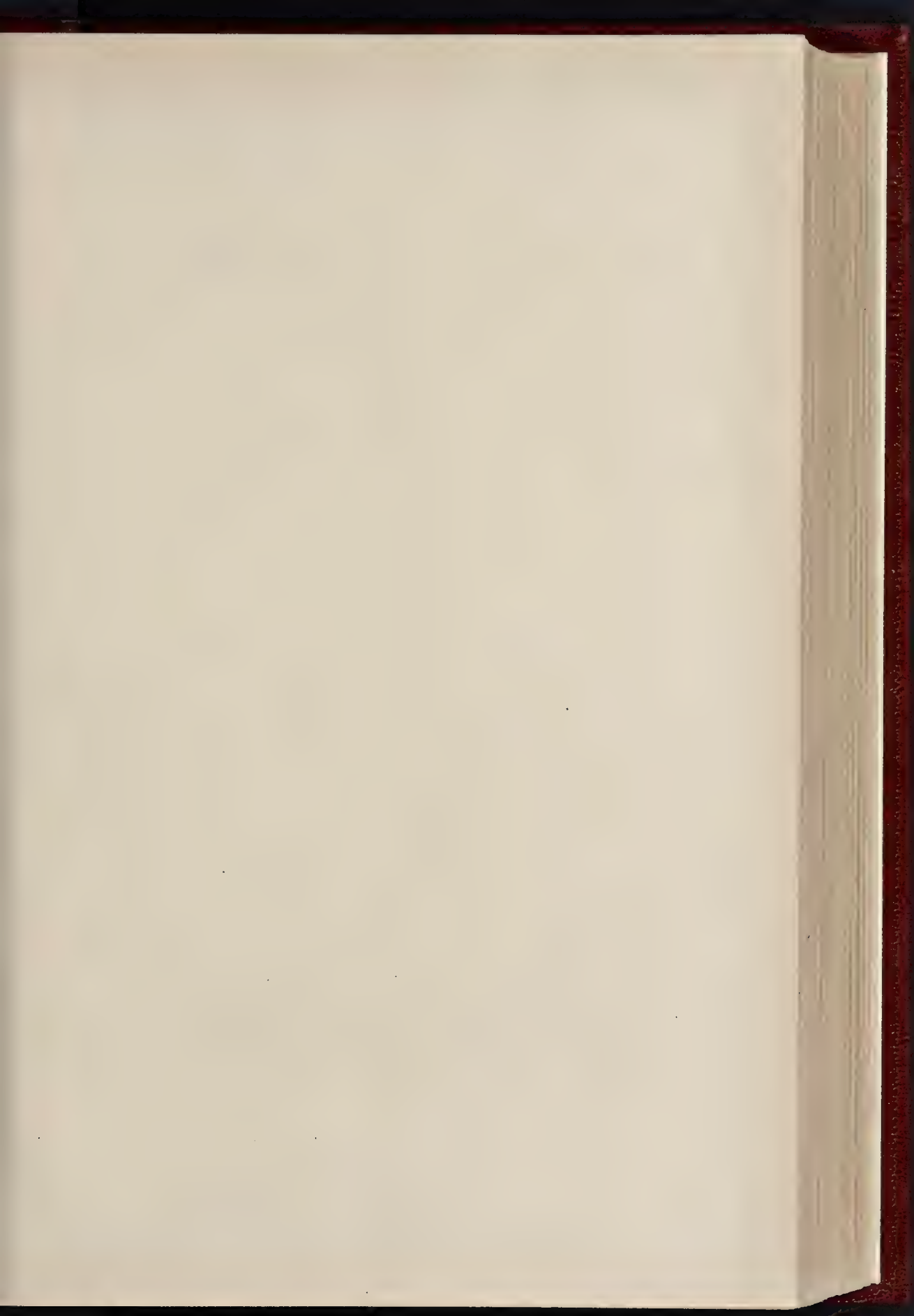




21 Egerton Gardens.  
for W. Whetley Esq. S.W.  
T.R. Smith Architect.









WORKSOP PRIORY CHURCH: INTENDED NEW



JULY 14, 1888.



R. MESSRS. CARPENTER & INGELOW, ARCHITECTS.

The Phototype Co., 308, Strand, London.





vised for effecting the end in view, viz., the prevention of sewage nuisance.

In my opinion, the only other feasible plan is that of aeration. The oxygen is to be had for nothing, and the cost of pumping air need not be considerable. The adoption of such a plan raises questions with which I am not now in a position to deal, although I believe that this may turn out to be a solution of the problem. At any rate, I feel sure that this is a matter well deserving of further inquiry. The rapid purifying effects of aeration on the sewage have been repeatedly observed in my laboratory experiments.

#### General Conclusions.

In conclusion, I wish to remark that I offer no opinion as to the processes of precipitation by chemical treatment, as this question was not submitted to me by the Board. Looking, however, at the broad question of the permanent disposal of the Metropolitan sewage, and believing that the use of deodorants ought to be regarded only as a temporary expedient, I feel convinced that, sooner or later, the recommendations of Lord Bramwell's Commission (see Conclusions, &c., 10 and 13, in the Report of the Royal Commission) will have to be adopted, and that the sewage, whether previously clarified or not, must either be filtered through land or discharged into the estuary at a point not higher than the sea reach. The growth of the Metropolis during the quarter of a century which has elapsed since the adoption of the present main drainage and outfall system has been so enormous that arrangements which worked satisfactorily up to some few years ago are now found to be inadequate, and will, of course, become more so as time goes on.

The gravity of this question can hardly be over-estimated, and its character and scope was brought prominently before me as a member of Sir Charles Russell's Select Committee on the pollution of the River Lea in April, 1886.

I desire to express my thanks to my assistant, Mr. Harry Baker, F.C.S., who has ably carried out both the experiments at the outfalls and those made in the laboratory; to Messrs. Carey & Brook, of Widnes, who kindly lent skilled men to superintend the work of deodorisation; and, lastly, to the several officials of the Board, without whose co-operation and goodwill the above inquiry could not have been carried out.—I have the honour to remain, my Lord, yours faithfully,

HENRY E. ROSCOE.

December 9th, 1887.

To Lord Magheramorne, &c., &c.,  
Chairman of the Metropolitan Board of Works.

#### SUMMARY OF APPENDICES.

Appendix A contains details of experiments, quantities of deodorants used, rainfall returns, &c. The results of examination by smell of sewage discharged after treatment at Crossness with leaching powder as a deodorant are as follow:—

July 19.—(1). Only slight smell. (2). Improved by 3 grains bleach. (3). Much improved by 3 grains bleach. (4). Smell, quite sewagey, nearly deodorised by 3 grains bleach.  
July 20 (tested 21).—(1). Almost odourless. (2). Bad smell. (3). Bad smell. (4). Smelt badly; deodorised by 3 grains bleach.  
July 21 (tested 22).—(1). Smelt of bleach. (2). Deodorised. (3). Smelt bad; deodorised by 3 grains bleach. (4). Not very strong smell.  
July 22 (tested 23).—(1). Does not smell badly. (2). Bad. (3). Stinks. (4). Smells badly.  
July 25.—(1). Deodorised. (2). Deodorised. (3). Deodorised. (Ditto, tested 26).—(1). Not bad. (2). Bad. (3). Smelt. (4). Smelt.  
July 26 (tested 27).—(1). Rather badly. (2). Deodorised. (3). Sewage. (4). Deodorised.  
And so on to August 27.

Appendix B contains particulars of experiments showing (1) that bleaching powder is destroyed by sewage slowly; (2) that the amount destroyed depends upon the amount added.

(I.) Experiments by Dr. Hurter, Widnes.  
(II.) Experiments at Crossness.  
(III.) Experiments at Manchester.

Also the following tables:—

Table I.—Showing quantities of bleaching-powder used as a deodorant at Barking and Crossness, from July 2nd to August 26th, 1887.

Table II. (signed by W. J. Dibdin).—Showing quantities of manganate of soda and sulphuric acid used at the outfalls, 1887.

Also returns of quantities of deodorants used, beginning with the following:—

Return of Quantities, No. 1.  
Engineers' Department,  
Spring-gardens, S.W.  
22nd November, 1887.

#### DEODORISATION.

Dear Sir Henry.—Hereunder I send you the information asked for in your letter to me of the 5th inst. :—

| Questions.                                                                        | Answers. | £                                               | s  | d  |
|-----------------------------------------------------------------------------------|----------|-------------------------------------------------|----|----|
| 1. Cost of deodorisation applied to the sewers for removing emanations this year? | 1.       | 42                                              | 16 | 11 |
| 2. Cost of chemicals used at outfalls this year?                                  | 2.       | 42                                              | 46 | 12 |
| 3. Ditto for years 1885 and 1886?                                                 | 3.       | 1885, Sewers 5,639                              | 0  | 0  |
|                                                                                   |          | Outfalls 26,153                                 | 9  | 3  |
|                                                                                   |          | 1886, Sewers 33,325                             | 0  | 0  |
|                                                                                   |          | Outfalls 47,747                                 | 0  | 0  |
| 4. Number of complaints of smell from sewers since June last?                     | 4.       | Forty-three, particulars of which are enclosed. |    |    |

All the foregoing amounts are exclusive of the cost of labour.  
I am, dear Sir Henry,  
Yours faithfully,  
J. W. BAZALGETTE.

Sir H. E. Roscoe, M.P.

The Appendices also include registers of rainfall in 1885, 1886, and 1887.

### Illustrations.

#### WORKSOP PRIORY CHURCH.

THE drawing which we publish this week is illustrative of the scheme which is in contemplation for an enlargement of the ancient Augustine Canons' Church at Worksop, founded by William de-Lovetot in 1103, this enlargement being in such a style, and of such proportions, as to harmonise with the old work.

The present eastern termination is a wall built under the western arch of the Norman tower, the monastic choir having entirely disappeared, excepting some of its foundations, which have been from time to time discovered. The beautiful Lady-chapel, however, still remains, though in a ruinous state, with a fragment attached to it of the Norman southern transept.

There seems to be little doubt that the original Norman choir was taken down and was rebuilt at about the same time as the Lady-chapel was erected. This rebuilt choir, with the retro-choir, was a structure of five bays in length, and in the latter were placed many magnificent tombs and monuments of the de-Lovetot and de-Furnival families, and the tombs of the great Sir Thomas Nevil and his wife.

The nave, with its aisles and western towers, is an example of that beautiful Transitional style in which both round as well as pointed arches and windows are found. It was altered in the fifteenth century, and attained its present appearance after repairs in recent times.

The arrangements for the services are, however, found to be inconvenient and crowded, and with a view of remedying this, it is proposed to cover a portion of the area of the former monastic church by erecting on the site of its choir a chancel of a size sufficient for the purpose, with its eastern wall situated as nearly as may be where the division formerly was between the choir and the retro-choir of the priory church. The southern arch of this chancel will give access to the Lady-chapel, which it is proposed to repair and to use, together with the rebuilt south transepts, for the daily services.

In the preparation of the designs the desirability of following the general proportions of the ancient nave have been most carefully borne in mind, and for this reason the Transitional style and proportions have been adopted for the new work, rather than those of the pronounced Early English period, which would be necessary in any reproduction of the great choir and retro-choir of the thirteenth century.

The design of the chancel arcade has been founded on some remaining stones of richly-ornamented arches, while the windows and other features follow the examples of the corresponding features in the nave and in some other Yorkshire churches of the same period. The south transept is, in its design, reproduced with almost absolute certainty from the fragment of the ancient one still preserved.

But with regard to the design of the Early English choir, there is nothing to be learned excepting the intercolumniation and height of its arcade, which can be deduced from the remains of the arches formerly opening into the Lady-chapel from the southern ambulatory.

There is worked out on this data a design of such a choir as may have been carried out, and which may have been intended to be continued on by rebuilding the nave also, as was so frequently done in Mediaeval days. It is, however, quite as likely that the contemporary Southwell choir treatment (viz., an arcade and clearstory only) may have been adopted for the choir at Worksop.

Possibly, also, the choir and its aisles may not have been grained in stone, though, like the Lady-chapel, commenced with that intention.

This and other questions are of very great interest for study and conjecture, but the correct solution of them is now well-nigh impossible. The aim of the architects (Mr. R. Herbert Carpenter and Mr. B. Ingelow) has, therefore, been to prepare a design to be (it is hoped) gradually carried out, in such proportions and details as shall harmonise alike with both the nave and the Lady-chapel.

#### HOLLY HILL, HARTFIELD, SUSSEX.

THIS house has just been completed for Mr. John McAndrew. It stands in a beautiful position overlooking Crowborough Forest, and takes the place of a smaller house which had become dilapidated. The cost, including stabling, lodge, laundry, &c., has been about 14,000l. The contractor is Mr. Longley, of Crawley. Doulting-stone has been used. Internally there is a good deal of panelling and other work in walnut, as well as some enriched plastering. The house is lighted throughout by electricity, for which both the apparatus and the ornamental fittings have been supplied by Messrs. Thompson & Ritchie. The engineers' work has been executed by Mr. Woolgar, of East Grinstead; while the heating apparatus, range, and grates have been made by Messrs. Longden & Co. The house is very complete in all respects. The drainage is extremely perfect, and has been planned by Mr. Kinsey, of Oxted, Surrey.  
J. OLDRID SCOTT.

#### No. 31, EGERTON GARDENS.

THIS house, now approaching completion, has been built for Mr. W. Whethery on a newly-developed estate, a short distance west of Cadogan-square. The front faces a new road on the estate, and has been carried out in red brick, with stone dressings. The carved brick-work and modelled cement panels above the second-floor windows have been executed by Mr. Gilbert Seale. The back faces the Fulham-road, and has been carried out in yellow-brick, with red-brick dressings.

The whole of the windows to ground, first, and second floors have been filled with lead-quarry glazing, by Messrs. Campbell, Smith, & Co. The floors of hall and all principal rooms are to be laid with parquet by Mr. Ebner.

Electric light is to be supplied to all the reception-rooms, hall, and staircase.

The plans accompanying the illustrations explain the accommodation provided on the principal floors.

The work has been carried out by Messrs. Matthews & Co. (by whom all the buildings on the estate are being erected) from the designs; and under the superintendence of Mr. T. H. Smith, architect.

#### SECOND PREMATED DESIGN FOR

##### INDIANAPOLIS MONUMENT,

The design for a Soldiers' and Sailors' Monument, for the State of Indianapolis, which we publish, is by Mr. Percy G. Stone, and took the second place in the recent competition for this object in the United States. The author of the selected design is Herr Bruno Schmidt, of Berlin. His design, which was illustrated, by agreement with the Board of Commissioners, in the *Inland Architect* of Chicago, takes the form of an enormous square stele, crowned with battlements at the top, standing on or rising from a wider erection, by way of subbase; the latter is in itself a large building, with details of an Egyptian tendency. Immense trophies of prowess of ships, &c., and groups of gigantic figures, diversify the design, the scale of which can only be conjectured from the diminutive size of the figures of spectators inserted in the drawing: the design itself is completely out of scale, and not in very refined architectural taste, and it will never convey a notion of its real size, except on very close inspection.



The remainder of the designs are a curious group, but with some ideas among them. One shows a vast circular cone, surrounded at the lower portion by a classical architectural screen square on plan; the interior is a Greek cross compartment, with a domed ceiling, and a figure in the centre. One of the best drawings shows an extraordinary-looking erection, having a remarkable phallic appearance (no doubt quite unintentional), a kind of obelisk, spreading out at its base; it is absolutely plain outside, but has a richly-decorated round-arched hall in the base internally; there seems to be a staircase up to the top of the obelisk, but no window to see from is shown in the drawing. There are others in more ordinary architectural forms, some of the pavilion, some of the column type. Most of them have the same defect as the prize design,—want of scale. The one which we publish we leave to speak for itself.

#### THE ROYAL ACADEMY: ARCHITECTURAL SCHOOL.

THE following students have just been admitted to the Architectural School, Mr. R. Phené Spiers, Master:—

| Upper School.    |                     |
|------------------|---------------------|
| F. D. Bedford.   | H. P. Lancaster.    |
| T. Davison.      | F. C. Ryde.         |
| W. M. Duke.      | C. S. Spooner.      |
| C. S. Haywood.   | F. J. Verity.       |
| W. F. Horton.    |                     |
| Students.        |                     |
| T. C. Agutter.   | W. J. W. Roome.     |
| C. J. Blomfield. | W. Sheen.           |
| L. C. Cornford.  | J. C. Watt.         |
| A. Mackintosh.   | E. J. A. Wigram.    |
| E. A. Rickards.  |                     |
| Probationers.    |                     |
| F. W. Bedford.   | A. M. Poynter.      |
| D. J. Blow.      | J. Rawlinson.       |
| W. A. Fenn.      | F. E. Smce.         |
| J. W. Little.    | E. W. M. Wonnacott. |
| J. G. Oakley.    | P. S. Worthington.  |
| J. Paxton.       |                     |

#### SANITARY WORKS AT CROYDON.

By the invitation of Dr. Alfred Carpenter, and with the permission of the Corporation of Croydon, the members of the Association of Public Sanitary Inspectors on Saturday paid a visit to Croydon, for the purpose of viewing the sanitary works of the town. The party, numbering about eighty, were received at West Croydon Station by Dr. Carpenter, and were conducted by that gentleman to the Beddington Sewage Irrigation Farm. The visitors included Professor Corfield, Dr. Parke, and other gentlemen interested in sanitary matters.

Mr. Walker, Engineer to the Corporation of Croydon, explained the details of the system in vogue at the farm. The sewage is received at Brimston Barn, and is there passed through a large revolving wheel (driven by a turbine worked by the sewage), which serves to extract rags and coarse solids. The residue is conducted to the Beddington Sewage Farm, which has an area of about 500 acres, of which not more than 75 acres are under irrigation at one time. The sewage enters the farm at its south-east corner, and passes across the land to its west or lower side. The system adopted is that of broad or surface irrigation, and, as a rule, the sewage passes over three separate fields. In the first, all floating particles are arrested by the Italian rye grass, which (being a great absorber of sewage) forms the staple crop, and the sewage is thus partly purified. From the second field the water passes off, clear apparently, though not quite (chemically) pure; and the third field, which is a permanent pasture at the lower part of the farm, removes nearly every remaining trace of sewage. The land generally is very suitable for irrigation, and has an easy and natural fall to the Wandle, and the necessity for pumping is thereby obviated. In some sewage farms a storm overflow is provided, into which the storm water is passed without going over the crops; but at Beddington all the sewage is passed over the land. The average dry weather flow is about four million gallons per day, but in time of storms the flow is much larger. In January 1879, after a thaw and rain, the gauge measured upwards of twelve million gallons in twenty-four hours. About an acre and a

half of land at the south-west corner of the farm is occupied by a dairyman, who keeps upwards of 200 fine milch cows in sheds. The animals are largely fed on the rye-grass and mangolds produced on the farm. In the summer, horses and cattle are taken in to grass, and last year's receipts under this head were over 500l. For the year ending Lady-day last the surplus of receipts over expenditure amounted to upwards of 1,000l. The land was purchased at the rate of 275l. per acre, the payment being spread over some forty years. It is estimated that the cost of disposing of the sewage does not amount to more than a rate of threepence in the pound on the rateable value of the town, the whole of which goes to pay interest and purchase-money for the land.

The Corporation Water Works were afterwards visited. The supply is drawn from a series of wells sunk into the chalk, and varies from two to three million gallons per day.

The Public Baths were also visited, and the company then adjourned to the Public Hall in George-street, where they were entertained at a cold collation by Dr. Carpenter. Amongst those present were Alderman Grundy, chairman of the Farm Committee, and Dr. Thornysson, chairman of the Sanitary Committee of the Corporation.

Dr. Carpenter delivered a brief speech, in the course of which he commended the Association of Public Sanitary Inspectors to the support of all connected with local government. It had been expected, he said, that their President, Mr. Edwin Chadwick, C.B., would have been present, but he had received a letter from that gentleman apologising for his absence. It was proposed, Dr. Carpenter continued, to send the London sewage into the sea, and to spend an amount of money which, to his mind, seemed a most monstrous waste whilst there were hundreds of thousands of acres of land within easy reach which, if the London sewage were passed over them, could be converted from barren land worth nothing into land capable of producing such crops as they had seen that afternoon at Beddington.

Mr. Alderman Grundy gave some details of the working of the farm, and Dr. Thompson also spoke. Upon the motion of Mr. Hugh Alexander, chairman of the Council of the Association, a hearty vote of thanks was accorded to Dr. Carpenter and the Corporation, and the party afterwards returned to town.

#### COMPETITIONS.

**Enlargement of the Guildhall, Cambridge.**—The General Purposes Committee of the Cambridge Town Council have awarded the first premium of fifty guineas to Mr. G. McDonnell, A.R.I.B.A., of London; and the second premium of twenty-five guineas to Mr. Henry G. Ladson, of Upper Edmonton, N., for the selected designs in the recent open competition for the enlargement of their Guildhall. The limit of expenditure was put at 16,000l.

**Cottage Homes for Workhouse Children, Wolverhampton.**—The Birmingham Daily Post reports that at the meeting of the Wolverhampton Poor Law Guardians, on the 6th inst., the Cottage Homes Committee, which was appointed to consider the question of erecting cottage homes for the workhouse children, presented their report. It stated that the committee had received seventeen sets of plans from local and other architects. The highest of these set down the estimated cost at 40,000l., and the lowest put it at 13,040l. A sub-committee was appointed to examine the plans, and they made the following selection: Mr. G. H. Stanger, 14,561l.; Messrs. Cox & Johnson, 13,897l.; Mr. Arkell, 13,248l.; Messrs. Essex & Nicholl, 13,800l.; Mr. Veall, 13,040l.; and Messrs. Fleming & Edwards, 15,900l. Of these the committee selected the first three for presentation to the Board. They preferred the plans of Mr. G. H. Stanger, of Wolverhampton, and advised their adoption. Mr. T. D. Green-sill announced that next week he would propose the acceptance of the committee's recommendation.

**The Proposed Solicitors' Library, Edinburgh.** The Scotsman states that, in regard to the proposed new S.S.C. Library, the Council of the Society, after considering the reports and information received from professional gentlemen consulted, have unanimously resolved that in their opinion the plan bearing the motto "Widom, Health, and Beauty" is entitled to

the first place in the competition, and that the plans bearing the mottoes "Scottish Seventeenth Century" and "S.S.C." are entitled, the former to the first and the latter to the second premium. The author of the plan "Widom, Health, and Beauty" is Mr. James B. Dunn, who, it may be remembered, was the author of the second premiated design for the Public Library buildings. The second design is by Messrs. McArthur & Watson, and the third is by Mr. G. Washington Browne.

#### ARCHITECTURAL SOCIETIES.

**Manchester Architectural Association.**—On Saturday last the members of the Manchester Architectural Association had an excursion to South Wingfield Manor House, Derbyshire. On arriving at Matlock Bath, the party were taken in a wagonette across the hills, a distance of seven miles, to Wingfield. This once splendid mansion is situated on a hill, and a grand view of the surrounding country of Derbyshire is commanded from the High Tower. The building is supposed to have been erected by Ralph Lord Cromwell in the reign of Henry VI., and the arms of the Cromwell family occur on the battlement of the hall porch. The building is now a mere ruin, but has still some interesting detail left, and the arrangement of the various apartments can pretty nearly be made out, the outer courts being no doubt a farmyard, but the farm buildings are nearly all destroyed. In the inner court the buildings are more perfect, especially the hall, with its porch. At one end of the hall is a fine bay window, the tracery of which is all complete, as well as the richly panelled stone ceiling over the bay. At the other end of the hall are placed the offices and kitchens. Over the offices was, no doubt, the chapel, though it is now called the "State apartment." The traceried window in this part is most certainly the richest in the house, with a good crocketed hood-mould. Under the hall is a range of vaulted cellars, which is called the crypt, but was really the wine-cellar. In the centre of each bay of the vault is a round flat boss with wheel-like paneling encircling it; the ribs are massive, and the central pillars short and thick, with plain impostes. On the western side of the inner court are the remains of a range of Elizabethan buildings, in which Mary Queen of Scots is said to have been imprisoned. The members of the Association found ample material for making measured drawings and water-colour sketches of various parts.

**Edinburgh Architectural Association.**—The annual general meeting of this Association was held on the 5th inst., in the Architectural Hall, 42, George-street, Mr. Hippolyte J. Blanc, president, in the chair. The report of the hon. secretary (Mr. T. Fairbairn) stated that the Association during the past session had more than maintained its position. Much work remained to be done, but happily there was a nearer approach shown to that ideal which should be the aim of all such societies. The membership had increased, thirty-four names having been added to the roll, while withdrawals had been considerably fewer. Mr. How Wardrop, Mr. James C. Walker, Mr. William Johnstone, Mr. Charles Leadbetter, and Mr. John Stuart Burnett were among those who had passed away since last annual meeting. The Treasurer's report, submitted by Mr. J. White-law, showed a balance at the close of last session of 170l., and subscriptions 123l. The total charge amounted to 297l. The following office-bearers for the ensuing year were afterwards elected:—President, Professor Baldwin Brown; Past President, Mr. Hippolyte J. Blanc; Vice-Presidents, Mr. John Kinross and Mr. Archibald Macpherson; Secretary, Mr. T. Fairbairn; Treasurer and Assistant-Secretary, Mr. A. Dodds Fairbairn. The honorary librarian, convener, and council were also appointed. In his valedictory address, the President referred to the recent efforts of the Association in the way of work classes, and said that these were of a purely voluntary character, and had been continued during the session with most gratifying success. Of this effort too much could not be said. These classes were the only means by which the individuality of the architectural pupils could be brought out and guided. As a supplement to office work they were invaluable, and were analogous in a minor degree to the teachings at the École des Beaux Arts and extra-mural in-



struction given to pupils on the Continent and in London. The number of students was year by year increasing, and as it could scarcely be hoped that conductors of classes would continue unaided the great labour involving upon them of preparing for and directing such classes, it seemed a fitting subject for special effort to secure external help towards their endowment. The several professions in the city had each their centre of teaching, but architecture was expected to blossom upon the sole assistance of such scrap guidance as chance might place in the way of her pupils. Surely, he said, the efforts that were being made by the society towards supplying the great want of a means of education to the architectural student were such as to justify a claim upon such funds as the surplus from the recent Exhibition proceeds.

*Glasgow Institute of Architects.*—A meeting of this Institute was held in the Religious Institution Rooms on Monday last, Mr. David Thomson, President, in the chair. The President having in feeling terms referred to the death of Mr. James Salmon, I.A., F.R.I.B.A., which had taken place since the last meeting, it was unanimously resolved to place on record the Institute's sense of the great loss thus sustained by it, and also by the architectural profession of Glasgow, among whom the deceased was held in the highest estimation. Mr. Salmon was one of the originators of the Institute, took a leading part in its formation, and has all along taken a most lively interest in its proceedings. The Institute has been much indebted to him not only for its formation, but also for much of the success it has achieved. Mr. Salmon has all along been a member of the Council, and he was the first President, and held office for two years. The Secretary was instructed to send an excerpt from this minute to Mr. W. F. Salmon in order to convey to the late Mr. Salmon's family the deep sympathy of the Institute.

#### THE BUILDERS' ACCIDENT INSURANCE (LIMITED).

THE seventh ordinary general meeting of this company was held at the offices, Bedford-street, Strand, on the 5th inst., Mr. Stanley G. Bird in the chair. The minutes of the 29th of July, 1887, were read and confirmed. The Secretary (Mr. E. S. Henshaw) read the report and balance-sheet for the year ending the 31st of May, 1888. The report contained the following passages:—

"In presenting their seventh annual report, the directors have to record the heaviest payment of claims the Company has experienced since its formation, amounting to seventy-six per cent. of the net premiums, but they regard it as satisfactory that they have been able to meet these liabilities without entrenching on the sum of £2,000 held specially in reserve, as approved at the last annual meeting, and to show a balance of £711.

The slight falling off in the premium income is mainly due to the great depression in trade, which is shown by the fact that the Company have returned £504 for premium paid on wages, but expended

The number of accidents (113) reported to the Company by policy-holders during the past year is largely in excess of those during the previous twelve months.

The accounts show that after receiving £2,119, for unsettled claims and unexpired risks on policies in force on May 31st, 1888, in addition to the £2,000 already held in reserve, there is a balance of £711.

Last year the directors drew attention to the report of the Select Committee of the House of Commons appointed to inquire into the proposed amendments of the Employers' Liability Act, 1880. . . . The directors fear that the result of the legislation on this subject in the present Session will render it necessary for them to reconsider the rates of premium.

The directors feel they may have to consider the desirability of issuing policies to cover the workmen from all accidents whilst engaged at work, to the premium upon which the workmen should contribute upon the lines indicated in the Bill now before Parliament.

It is with extreme regret that the directors have to record the death of their much-esteemed colleague, Mr. Thomas Patrick, who was one of the first directors of the Company."

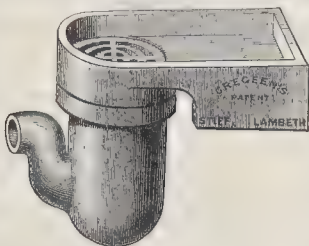
The report and balance-sheet, as presented to the meeting, were adopted unanimously, and the following five directors, Messrs. F. J. Dove, J. S. Jones, Wm. Southern, Thos. Urmon, and J. C. White, who retired from the Board under the Articles of Association, were re-elected, and Mr. John Mowlem Burt was elected a director to fill the vacancy on the Board caused by the decease of Mr. Thomas Patrick, who was on the rota to retire this year.

The usual formal resolutions having been passed, the meeting terminated with a vote of thanks to the Chairman.

**Sir Frederick Leighton.**—The freedom of the Grocers' Company will, says the *City Press*, be presented to Sir Frederick Leighton on Wednesday, the 25th inst.

#### CREGEEN'S COMBINATION GULLY TRAP AND CHANNEL.

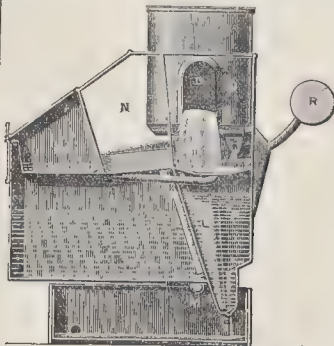
THE combined gully-trap and channel which is shown by the accompanying illustration is the invention of Mr. Hugh S. Cregeen, Surveyor to the Bromley Local Board, and it is made by Messrs. James Stiff & Sons, of Lambeth. It is designed for the disconnection from sewers and drains of the waste-pipes from sinks, baths, lavatories, cisterns, safes under baths or closets, and also the rain-water pipes. In the "Model By-laws" of the Local Government Board it is prescribed that all waste-pipes are to discharge in the open air, over a channel leading to a trapped gully grating.



Hitherto these waste-pipes have discharged their contents over gullies or into channels constructed or fixed in the ground. The object of Mr. Cregeen's invention is to combine the gully trap and channel, and thus obviate the necessity of constructing or fixing special channels. It is evident that by the use of the "Combination Gully Trap and Channel" a great saving and convenience will be effected, and greater cleanliness secured. The circular form of the adjoining portions of the gully and channel admits of the connexion being made at any horizontal angle of channel and drain. The channel has an inclination towards the galvanised iron grating over the gully. This grating is easily removable for purposes of cleansing. Altogether this strikes us as being a very good sanitary appliance.

#### ROBERTS'S RAIN-WATER SEPARATORS.

An improvement has recently been introduced in Roberts's Rain-water Separators, which enables them to work in many situations where there was not sufficient vertical space to introduce a horizontal "Separator" of the older pattern. It will be seen by the illustration



that the canter is now placed at right angles to the stream of water passing from the head. Instead of the water passing round the side of the canter and being delivered below, as in the older forms of the "Separator," it is now carried through one of two diverging channels in the upper part of the canter, at first through the one that carries it to the waste-pipe, and then through the other directing it to the storage tank. The stream is thus kept in an almost horizontal direction throughout its course. The diminution of the vertical space required will be obvious when it is stated that the vertical distance between the inlet and outlet pipes for pure water in an old No. 3 Separator was 2ft., while in the new No. 3 it is only 6 in.

\* These have been already fully described and illustrated in the *Builder*. Vide Nos. for April 10, 1886, and June 11, 1887.

#### MR. CHISHOLM'S DESIGN FOR BOMBAY MUNICIPAL BUILDINGS.

SIR,—In your criticism of the Royal Academy drawings, you say of my design for the Bombay Municipal Buildings, now being exhibited at the Academy: "Though there is a general Oriental look about the design, the European hand is everywhere obvious, and thus there is a sense of incongruity and incompleteness; the building has an Oriental aspect without Oriental feeling."

I agree with you that the feeling is eminently Classical, but I would like, with your permission, to point out that this undoubted European or Classical feeling was not introduced by me; it is found in all the purest specimens of the particular style. In a paper which I read before the Royal Institute of British Architects, I pointed out with regret that attempts to revive Indian art invariably displayed some picturesque phase of the later marble works of Upper India, when architecture had lost nearly all traces of constructive propriety, and that the pure, "almost classical," sandstone art, which preceded the marble work, received little or no attention. Hence, although it is no matter of surprise to me that English critics, seeing a design in this pure style, should draw somewhat hasty conclusions, it would be utterly humiliating if those conclusions were well founded, if thirty years of almost continuous exile in India, and a close study and practice, for many years, of Indian art, should result in producing nothing more than a European building dressed with Indian details!

If I had to depend on argument alone, I should not attempt to question the accuracy of your conclusions, but a mere recital of the circumstances under which the designs were prepared will, I think, show conclusively that nothing short of inspiration could have produced Italian.

I saw the advertisement giving notice of the competition the day before I left England. I wrote to Messrs. Roberson, of Long-acre, to send a roll of paper to the care of the purser of the P. & O. steamer *Verona*, which left on the 26th August, and with some little difficulty obtained the printed instructions. I had no architectural books with me, and no drawings or photographs of European buildings. I had about a dozen photographs of Ahmedabad and Sirage, and my sketch-books of details from the same places. I commenced work in the Bay of Biscay on the 22nd, on the same table as Mr. — F.R.I.B.A., who was a fellow-passenger as far as Gibraltar, and who had himself some drawings to finish. By the time the *Verona* arrived in Bombay, my son and I had completed most of the drawings in pencil. Whence, then, came the European feeling? It could only have been inspired by saloon decorations, sky-light tables, and the ships' pumps!

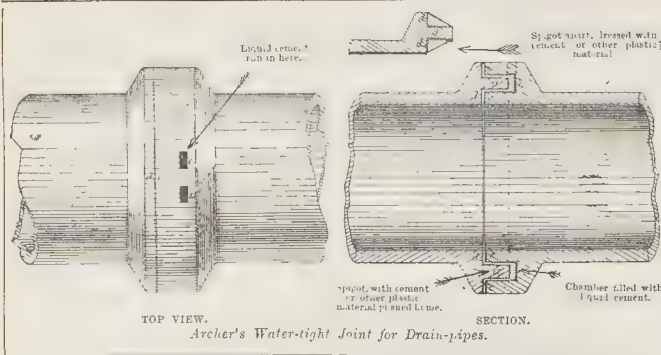
The "As you like it" style of native art, which would doubtless be instantly recognised as Indian, is in reality a late importation from the banks of the Bosphorus, with a dash of Italian. I beg to forward you a photograph of the old Hindoo palace at Sirage, and I think you will admit that no one unacquainted with this style would at the first glance think it represented a purely Indian ruin. I may mention that, with the exception of certain Saracenic features in the upper part of my design, all the details were culled from within a circle of ten miles from this ruin. I also forward to you for inspection (and if you think it desirable for publication) two line drawings of designs in native styles of art. The casket is an adaptation of pure Hindu art, the crenelation of Hindu art grafted with Mussulman and Byzantine.

R. F. CHISHOLM,  
Consulting Architect to his Highness  
the Gaikwar of Baroda.

Sirdar's Mansions, Bombay,  
4th June, 1888.

\*\* We do not quite see the force of Mr. Chisholm's argument, that there could be no European feeling in his design because it was elaborated on shipboard and away from any European models. He is, after all, a European architect originally, and may have retained more of the old leaven than he is quite aware of himself. The photograph of the palace at Sirage, which he has sent us, is, however, distinctly a practical argument in favour of his view, and we admit that, for a genuine Indian building, it has a remarkably Classical general effect and expression.





## DRAIN-PIPE JOINTS.

SIR,—I read with considerable interest Mr. Norman Shaw's letter which appeared in your issue of June 30th [p. 466] on the subject of drain-pipe joints. This is a subject upon which I have bestowed some attention, particularly since I have had experience of laying some of the stoneware pipes which are specially made with the view of bringing about the watertight condition.

It appears to me that much a question of securing a thoroughly reliable and lasting watertight stoneware joint, because this may be effected for all practical purposes by the elaboration and laying on of material, and by unlimited expenditure,—as procuring one which will, at the same time, be sufficiently cheap to warrant Sanitary Authorities charging the owners and ratepayers with the cost of the same.

When making-up private streets under the 150th Section of the Public Health Act, I have frequently had complaints from owners of the heavy charges made for watertight pipes now in the market, and which engineers and surveyors are disposed to use in order to comply with the Model By-laws of the Local Government Board.

I enclose you plan and section of a joint ("Archer's water-tight pipe") which Mr. George Jennings, Lambeth, S.W., is making at my suggestion, and which I believe will prove to be one of the cheapest and most efficient water-tight drain joints yet made. All that the workmen have to do in laying it is to dress with any plastic material the inside and outside flange of the spigot (not touching at all the socket), send it home, and pour in the liquid cement into the one hole, as shown in the above plan; and when the chamber is full, the cement will flow out of the other hole, thus affording proof that the joint is water-tight,—is, in fact, completely sealed.

It will be noticed that before any gas or liquid can pass out of or into the pipe, the liquid or gas must pass through the hard mass of added material in the shape of a parallelogram, which completely encloses and holds fast the spigot on all sides. Moreover, I believe that this pipe will prove the best I have seen for bridging over sinkings of the bed. Again, the deviation from the true cylinder, which often happens in the process of firing stoneware pipes, will not affect the efficiency of the joint, because the spigot here is inserted into a comparatively wide chamber, which may be flooded with a liquid which fills up all irregular spaces.

Chiswick.

ARTHUR RAMSDEN.

## "A NEW FORM OF DRAIN-PIPE."

SIR,—The drain-pipe described and illustrated by Mr. R. Norman Shaw, R.A., in your issue of the 30th ult. [p. 466], was, in its essential features, the subject of a patent taken out by me about four years ago. Mr. S. Stevens Hellyer, to whom I submitted it, expressed his approval in a very obliging letter, and his intention to use it should it be introduced, but as it had not time,—nor, indeed, inclination,—to press the matter, it went no further, so far as its manufacture for the market was concerned. I have had the pipes made, and used them in my own practice, where there seemed special reason to employ them in preference to ordinary pipes, and have found them to make most satisfactory drains. I do not, of course, speak from very long experience of them. I have had them in use for something over four years, and have never known one to go out of order, although I cannot say so much for ordinary pipes laid within the last twelve months. The chief advantages are that the joints can be perfectly finished off in the inside of the pipe, so as to be absolutely smooth and tight; that they can be more accurately laid to the required gradient; and more satisfactorily tested than any other kind of drain-pipe. I have very little doubt that the pipe is an advance on any other in use, and is worthy of the attention of sanitary engineers. The shape that I have used most commonly has been a deepened half circle with flanges, and the covers I have made also with flanges, jointed and

well grouted with cement. I should be afraid that Mr. R. Norman Shaw's covers, not being flanged, would allow the liquid cement to drop through, and would thus admit, after all, the obstructions to the flow of water which it is the special merit of the patent to exclude altogether.\*

I scarcely like to hint at such a thing in the case of one who has been so long eminent as a leader in architectural design, but I am afraid that Mr. R. Norman Shaw has been for some time inadvertently infringing my patent.

T. L. WATSON.

108, West Regent-street, Glasgow,  
July 9, 1888.

## The Student's Column.

## ARTIFICIAL STONE.—II.

Vitrified or Glassy Stone.

**I**N this division are included stones which have been produced by the fusion of silicious or glass-forming material. The first of such patents was that of A. Ragon, secured in 1838, in which the casting of vitreous slag into regular and systematic shapes applicable to building and architectural purposes is claimed.

Several other patentees have also attempted to utilise the slag from iron, glass, and other furnaces. These slags consist mainly of impure mixtures of silicates and other fusible constituents of the flux and the ores that have been used, or formed by the mutual reaction, at a high temperature, of earthy constituents of the ore.

J. B. Borgognon in 1846 patented the production of what he termed "Artificial Basaltic Lava," and which was obtained by running the slag from iron and other metallurgical furnaces directly into heated moulds and cooling very slowly. Smith, of Philadelphia, and Bessemer in 1854, also patented the application of iron slag for making bricks, stones, architectural ornaments, &c. J. Sepulchre in 1863 proposed a process for producing the necessary article by remelting the slag, scoria, &c.: an obviously uneconomical suggestion, for if slag is to be used profitably in this particular direction it is tolerably certain that that can only be done by employing it as it flows directly from the furnaces of which it forms a by-product.

In another patent an attempt is made to secure greater homogeneity in the slag blocks by subjecting them to pressure in the mould as they cool.

Several other patents for dealing with slag will be discussed in a future article.

A closely-related class of patents to the above are those in which it is proposed to utilise what may almost be termed natural slags; such as basalt, lava, and other rocks of igneous or volcanic origin. Mr. J. F. Chance, of Birmingham, in 1851 patented the production of artificial stone by fusing and then casting or rolling a variety of basalt known as Rowley Rag or Whinstone. When the rock is melted in a reverberatory furnace and allowed to cool slowly in cast iron moulds a columnar structure is produced similar to that observed in the basaltic columns of the Giant's Causeway and Fingal's Cave.

A nearly related patent, which obtained provisional protection only, was that of Collard (1861), in which volcanic deposits such as lava

\* We understand from Mr. Shaw that this was provided against by luting the joint before applying the cement.

are melted, and in some cases fluxes such as potash, borax, minium, &c., are added. The melted product is to be run into moulds of the necessary form.

Of more vitreous stones, in which glass of some kind as ordinarily understood, forms an important constituent, the following are the chief:—C. Dod's imitation marbles, stones, agate, &c., obtained by melting mixed or colourless glass in freelay moulds of desired shape made smooth internally with talc and whitening. Special arrangements for heating from beneath to expel air as much as possible, and for gradual cooling, are provided (1840, pat. 8,702). Brough's "opaline," made by breaking up porcelain, china, earthenware, or parian, and fusing them with borax, boracic acid, soda, potash or oxide of lead,—borax is preferred. The mixture being sufficiently fluxed, it is run into water, stamped and ground, and the resulting material is added to broken glass, or glass-forming materials, and fused, cast into suitable shapes, cut and polished, and used for architectural ornaments or for forming a kind of veneer over coarse surfaces. Begue's artificial marble, produced by fusing together one ton of pit sand, one ton of powdered bottle-glass and eleven pounds of broken glass of various thicknesses (1864, pat. 488). Another glassy material intended as a substitute for marble was patented by Deane (1874, pat. 8,007), and made by fusing together oxide of lead, sand, pearlash, nitre, borax, white arsenic, and cryolite. Hunter's artificial marbles for statuary, cornices, &c., also consist of glasses of the desired colours, which, after being moulded, are subjected to the roughening or etching effect of a sand blast or hydrofluoric acid.

Other suggestions relate to the use of ordinary glass blocks carefully annealed, while Brandstätter's artificial stone, patented in 1885, is made by moulding, compressing, drying, and burning at a white heat, compounds containing quartz, magnesia, and, in some cases, minium.

In 1885 J. Budd patented a mode of producing surfaces resembling malachite, marble, or other stone, by using sheets and tubes of glass, the under or inner surface of which has been suitably coloured or ornamented. Pillars, pedestals, &c., may be provided with a core of wood, the space between it and the glass being filled in with sand.

In a large number of the above patents the products are characterised by extreme hardness, brittleness, and general unworkability, and in order to modify these qualities to some extent, a mixture was patented in 1845 consisting of four parts of sulphate of barium, one part of crown glass, and about one-fourth as much borax. These substances are melted in a glass furnace, and, if necessary, colouring matters are added. The resulting stone is said to be marble-like in appearance.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

11,438, Fireproof Holders for Joists for Party Walls. J. A. Cantle.

According to this invention, an iron shoe or socket is provided, of a form suitable for building in or on the party wall. The holder is lightened by taking the metal from parts where it is least required, and strengthened by giving extra metal to shoulders and parts where greatest strength is required. The joists or breastsummers are laid in the holder, which also provides orifices or slots through which the lathing may be affixed to the joists.

2,860, Stoves and Grates. E. P. Owens and G. Jennings.

According to this invention, air-chambers are formed at the back of terra-cotta stoves, which chambers are furnished with baffle plates. The middle chamber is contracted in width, so that the air is retarded in the hottest part of the stove, and afterwards it is allowed to expand by the increasing size of the heating-chambers, passing out by regulating ventilators into the apartment.

3,438, Heating Buildings. W. S. Johnson.

This invention relates to the automatic supply and regulation of heat to apartments by a system of apparatus in which electricity controls a fluid under pressure, and the fluid operates the controlling valves of the apparatus. The regulation is effected by means of a fluid obtained under pressure from a central source. A system of conductors and valves of a somewhat complicated character is used to effect this object.

6,324, Roofs of Greenhouses, &c. E. Newton.

Metal mesh bars, preferably of a T shape in cross section, are by this invention employed for sup-



porting the glass or slates. The system aims at a better and more ready attachment of the sash-bars to the bar which forms the ridge of the roof. An attachment of peculiar shape provides a bed for the T-shaped bars, this attachment riding on the ridge-bar, and the sash-bars sliding into it and being secured thereto.

6,472, Door Knobs. S. Crawford.

In order to afford additional security in fastening the knobs to the lock and door, and to allow for the shrinkage in the width of doors, the ends of the shanks of the knobs are, according to this invention, attached directly to the washer-plates and fastened by set screws to the spindles, which in this invention are made to turn with the knobs by the engagement of their square-sided ends with the peculiar-shaped cavities in the shanks and knobs. They are not otherwise attached to the shanks. The cavities in the shanks are made longer than usual, in order to enable the spindles to adapt themselves therein, and to allow the ends of the shanks to be brought close to the washer-plates in all cases, whatever the width of the door might be.

#### NEW APPLICATIONS FOR PATENTS.

June 29.—9,466, T. Tucker, Automatic Sash or Window Fastener.—9,484, F. Boshardt, Bathroom.

June 30.—9,528, O. Gibbons and Others, Ceramic Mosaic.—9,556, J. Holroyd, Falcance or Terra-cotta Mantelpieces, Firesides, &c.—9,559, C. Howe, Cement or Plaster for Rapid Fireproof Plastering, &c.—9,560, W. Eddington, Mortar-mills or Edgerunners.

July 2.—9,574, Emmott & Co., Tower Bolts for Doors, Windows, &c.—9,594, L. Van Parys, Raising and Lowering Windows.

July 3.—9,620, E. Hodded and E. Cooke, Nails.—9,634, W. Gregg, Brickmaking Machines, &c.—9,644, S. Bage, Dust and Draught Preventer for Doors.—9,646, J. Gregson, Clips or Hangers and Heads for Rain-water, Soil-pipes, &c.—9,648, J. Phillips, Sanitary Trap Gully.—9,655, A. Elmdorf and Others, Water-closets.—9,655, E. Foakes, Excavating Machinery.

July 4.—9,717, A. Moore, Latch or Mortise Lock Furniture.—9,733, E. Emanuel, Double Fan for Wash-out Closets.—9,751, F. Smith, Caps or Heads for Ventilating or Flue Shafts.—9,760, R. Pyne, Door Fasteners.

July 5.—9,761, J. Palmer, Plastic Wall Decoration Composition.—9,767, G. McNeil, Fastener for Lock for Window-sashes, Doors, &c.—9,786, H. Cullabine, Attaching Door-knobs to Spindles.—9,792, W. Stephenson, Automatic Atmospheric Door-closing Apparatus.—9,803, A. Hogan, Building Construction.—9,816, E. Newton, Actuating the Lights or Ventilators of Horticultural Buildings, &c.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

9,269, J. Pratt, Construction of Horticultural Buildings, &c.—7,327, H. Carew and F. Potts, Bricks and Building Blocks.—7,420, J. Tait, Inlet, Bricks and Building Blocks.—7,735, F. Lancaster and E. Nixon, Automatic Engine Door for Theatres, &c.—8,040, B. Robinson, Water-closets, &c.—8,133, G. Harvey, Stench-traps.—8,256, C. Jungst, Cutting Clay for Floor-tiles, &c.—8,338, H. Lansbury, Weather-bar for Doors and Windows.—8,412, H. Riess, Securing Open Doors, Hinged Windows, &c., in their Position.—8,485, R. Mannesmann, Fireproof Columns.—8,542, G. Anderson, Raising Girders, Trusses, &c., of Lorry Structures.—8,945, B. Shillito, Earth or Dry Closets.—8,960, J. King, Flushing Cisterns or Water-waste Preventers.—9,019, J. Parker, Domestic Fire-places, &c.—9,163, T. Twyford, Water-closets.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

9,269, J. Pratt, Construction of Horticultural Buildings, &c.—10,950, J. Bean and W. Gaines, Closing Doors and Preventing Slamming.—11,957, J. Wiltshaw, Door Mounts and other Knobs.—11,961, B. Turner, Door-springs.—12,014, G. Brewer, Automatically Closing Doors.—12,062, W. and S. Denham, "Filler" for French Polishing.—12,289, R. Johnson and T. Benton, Band Saws.—194, W. Fraser, Mouthpiece for Speaking-tubes.—1,715, A. Mitchell, Securing Slates to Roofs.—3,772, G. Barclay, Traps and Spigot and Faucet Drain Pipes.—7,602, W. and E. Simmons, Disinfecting Water-closets, Lavatories, &c.

**The Sledall Victoria Jubilee Almshouses and Church, Kendal.**—The formal opening of the above buildings took place a short time ago. The total cost of the erections and endowment was nearly 15,000l. The almshouses are twelve in number. The church, which is Gothic in style, will accommodate about 100 persons. The donor, Mr. John Sledall, formerly a wine and spirit merchant in Liverpool, and a native of the neighbourhood of Kendal, left nearly 30,000l. for charitable purposes for Kendal. He died soon after the foundation-stone was laid, in the early part of the Jubilee year. The architect for the buildings was Mr. Eli Cox, of Kendal, under whose supervision the works have been carried out.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

JUNE 29.

|                                                                |        |
|----------------------------------------------------------------|--------|
| By BLAKE, HADDOCK, & CARPENTER.                                |        |
| Mitcham—Sherwood Lodge and 9 acres, freehold                   | £1,800 |
| High-street, copyhold house and garden                         | 350    |
| Sherwood Farm and 8a. 1r. 11p., freehold                       | 2,000  |
| Enclosures of freehold land, about 10½ acres                   | 1,955  |
| Enclosures of freehold land, about 8a. 2r. 0p.                 | 1,460  |
| Copyhold house and two cottages                                | 285    |
| Five small plots of land, freehold                             | 588    |
| Vine Cottage, copyhold                                         | 112    |
| A plot of market-garden land, 2a. 2r. 15p., freehold           | 390    |
| Church-road, freehold factory                                  | 128    |
| Carlsham—A moiety of the Fox and Hounds public house, freehold | 1,100  |
| Lower Tooting—A moiety of the Mire public-house, freehold      | 3,000  |

JULY 2.

|                                                           |       |
|-----------------------------------------------------------|-------|
| By WALKER & RUNTZ.                                        |       |
| Wimbleton—Ground-rents of 284. 5s., reversion in 92 years | 2,285 |
| Ground-rents of 285. 5s., reversion in 87 years           | 2,376 |
| Ground-rents of 285. 5s., reversion in 88 years           | 1,930 |
| Ground-rents of 280, reversion in 91 years                | 1,800 |
| Ground-rents of 231. 10s., reversion in 96 years          | 650   |
| Ground-rents of 234, reversion in 65 years                | 1,625 |
| Ground-rents of 230, reversion in 64 years                | 8,750 |
| The Grange-road, plots of freehold land                   |       |

|                                                                                  |       |
|----------------------------------------------------------------------------------|-------|
| By MORTIMER & BOWEN.                                                             |       |
| Streatham Hill—Court Green, with pleasure-ground, 59 years, ground-rent £40. 4s. | 3,000 |

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|---------------------------------------------------|-----|
| By BRAD & SON.                                    |     |
| Acton—4, York-road, 79 years, ground-rent £8. 6s. | 150 |

|                                                            |     |
|------------------------------------------------------------|-----|
| By HENRY & LUTHERTON.                                      |     |
| Baham—Ormeley-road, Overton, 91 years, ground-rent £8. 8s. | 600 |

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|----------------------------------------------------------|-----|
| By MORTIMER & BOWEN.                                     |     |
| Oak Lodge and Fairfield, 91 years, ground-rent £14. 10s. | 990 |

|                                                        |     |
|--------------------------------------------------------|-----|
| By BRAD & SON.                                         |     |
| Clapham—41, Winton-road, 10 years, ground-rent £1. 7s. | 265 |

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|----------------------------------------------------------------------|-----|
| By BRAD & SON, & CHARTERS.                                           |     |
| Lambeth—12 and 13, Leopold-street, 70 years, ground-rent £8. 6s. 8d. | 180 |

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|-----------------------------------------------------------------------------------------|-------|
| By FARRERBROTHER, PALMER, & CO.                                                         |       |
| Fulham—Hurlingham Field Cottage, and a plot of land, 60 years, ground-rent £16. 7s. 6d. | 1,230 |

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|------------------------------------------------------------------|-----|
| By CLARK & CO.                                                   |     |
| Peckham—13 and 15, Culmore-road, 60 years, ground-rent £11. 14s. | 505 |

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|-------------------------------------------------------|-----|
| By R. W. MILLER.                                      |     |
| Kennington—2, Kempford-road, 39 years, ground-rent £1 | 345 |

|                                             |     |
|---------------------------------------------|-----|
| By PAICKEIT, VINALLER, & CO.                |     |
| 2, Fairford-grove, 42 years, ground-rent £5 | 250 |

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|---------------------------------------------------|-----|
| By J. T. REDFORD & CO.                            |     |
| Twyford (near)—Heath Villa and 21 acres, freehold | 845 |

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|----------------------------------------------------------------|-----|
| By J. T. REDFORD & CO.                                         |     |
| St. John's Wood—62, Cochrane-street, 31 years, ground-rent 2s. | 400 |

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|-----------------------------------------------------------------|-------|
| By DENKHAM, TEWSON, & CO.                                       |       |
| Cavendish-square—43, Wigmore-street, 55 years, ground-rent 47s. | 3,550 |

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|------------------------------------------------------------------|-------|
| By DENKHAM, TEWSON, & CO.                                        |       |
| Reigate Hill—The freehold residence, the Rock, and 23a. 2r. 11p. | 7,000 |

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|--------------------------------------------------------------|-----|
| By ALBERT RICHARDS.                                          |     |
| Edmonton—1 to 10 odd, Godwin-road, 90 years, ground-rent £30 | 300 |

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|---------------------------------------|-----|
| By M. S. SETH.                        |     |
| Clapham—32, St. John's-hill, freehold | 820 |

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|-------------------------------------------------------------|-----|
| By M. S. SETH.                                              |     |
| Peckham—1 to 11 odd, Hill-street, 63 years, ground-rent £27 | 455 |

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|------------------------------------------------------------------------|-----|
| By C. C. TAYLOR & SON.                                                 |     |
| Camberwell—159, 161, and 163, Neate-street, 47 years, ground-rent 40s. | 425 |

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|---------------------------------------------------------|-----|
| By E. & F. SWAIN.                                       |     |
| Notting Hill—Ground-rents of 424, reversion in 58 years | 585 |

|                                              |     |
|----------------------------------------------|-----|
| By J. HUBBARD.                               |     |
| Ealing—The Ealing Monumental Works, freehold | 950 |

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|----------------------------------------------------------------|-----|
| By W. ANDREWS & SON.                                           |     |
| Islington—155 and 159, Downham-road, 54 years, ground-rent £10 | 630 |

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|------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                       |     |
| 65, Stanley-road, 63 years, ground-rent £5. 12s. 3d. | 225 |

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|---------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                          |     |
| 38 and 39, Stanley-road, 63 years, ground-rent £7. 10s. | 800 |

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|----------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                     |     |
| 1 and 8, Canterbury-road, 63 years, ground-rent £7 | 500 |

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|-----------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                      |     |
| Camberwell—Ground-rent of 48, reversion in 65 years | 225 |

|                                                                  |     |
|------------------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                                   |     |
| Holloway—56, St. John's-road, 96 years, ground-rent 8s. 10s. 6d. | 900 |

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|-----------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                            |     |
| Blackheath—Bouldner Lodge, 73 years, ground-rent £2. 10s. | 905 |

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|-------------------------------------------------|-------|
| By FARRERBROTHER, ELLIS, & CO.                  |       |
| Stratford—39, 35, and 34, Webley-lane, freehold | 1,500 |

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|-----------------------------------------------------------------------|-------|
| By FARRERBROTHER, ELLIS, & CO.                                        |       |
| Rotherhithe—131 to 141 odd, New-road, 68 years, ground-rent £13. 10s. | 1,150 |

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|----------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                           |     |
| 143 to 149 odd, New-road, 73 years, ground-rent £9. 10s. | 785 |

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|----------------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                                 |     |
| 55, 57, and 58, Chilcot-street, 42 years, ground-rent £7. 10s. | 615 |

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|-----------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                            |     |
| Poplar—34 to 37, Sussex-street, 64 years, ground-rent £11 | 675 |

|                                                 |     |
|-------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                  |     |
| 32, Preston-road, 15 years, ground-rent £2. 5s. | 115 |

|                                          |     |
|------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.           |     |
| Walthamstow—Bloomfield Cottage, freehold | 570 |

|                                                                     |     |
|---------------------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                                      |     |
| Marblestone—5, Upper Bridport-street, 20 years, ground-rent £5. 5s. | 150 |

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|----------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                           |     |
| 27 and 28, Little North-street, 33 years, ground-rent £8 | 315 |

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|------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                       |     |
| Mile End—2, Joseph-street, 55 years, ground-rent £15 | 450 |

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|---------------------------------------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.                                |     |
| 115, 117, and 121, White Horse-lane, 19 years, ground-rent £7 | 425 |

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|---------------------------------|-----|
| By FARRERBROTHER, ELLIS, & CO.  |     |
| 153, White Horse-lane, freehold | 535 |

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|--------------------------------------------|----|
| By FARRERBROTHER, ELLIS, & CO.             |    |
| 3, Exmouth-street, 4 years, ground-rent £8 | 20 |

By INMAN, SHARP, HARRINGTON, & ROBERTS.  
Gravesend—3, Landown-square, 46 years, ground-rent 27. 10s. £250

JULY 5.

|                                                         |       |
|---------------------------------------------------------|-------|
| By DENKHAM, TEWSON, & CO.                               |       |
| Lee—the residence Lee Lodge, and 2a. 1r. 20p., freehold | 4,000 |

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|---------------------------------------------|-------|
| By BLAKE & CO.                              |       |
| Putney—9, 11, and 13, High-street, freehold | 2,460 |

|                                            |       |
|--------------------------------------------|-------|
| By BLAKE & CO.                             |       |
| 15, High-street, freehold, area 15,200 ft. | 3,200 |

|                                       |       |
|---------------------------------------|-------|
| By BLAKE & CO.                        |       |
| 17, 19, and 21, High-street, freehold | 1,880 |

|                                                      |       |
|------------------------------------------------------|-------|
| By BLAKE & CO.                                       |       |
| Browhouse-lane, a range of buildings, area 7,500 ft. | 1,080 |

|                                                 |       |
|-------------------------------------------------|-------|
| By J. C. PLATT.                                 |       |
| City—88, Walling-street, freehold, area 817 ft. | 4,500 |

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|-------------------------------------------------------|-----|
| By R. TOMLINSON.                                      |     |
| Uxbridge-road No. 570, 56 years, ground-rent £8. 10s. | 375 |

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|------------------------------------------------------------------------|-------|
| By NEWSON & HARDING.                                                   |       |
| Hammersmith—1, 3, 5, and 7, Rylett-crescent, 91 years, ground-rent £10 | 1,190 |

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|--------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                               |     |
| St. Ke Newington 242, Amhurst-road, 79 years, ground-rent £8. 10s. | 460 |

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|--------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                               |     |
| Islington—9, 10, and 12, Harding-street, 43 years, ground-rent £18 | 870 |

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|-------------------------------------------------------|-----|
| By NEWSON & HARDING.                                  |     |
| Clarendon—28, Baker-street, 18 years, ground-rent £10 | 200 |

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|----------------------------------------------------------|-----|
| By NEWSON & HARDING.                                     |     |
| Islington 10, Arthur-road, 54 years, ground-rent £6. 8s. | 315 |

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|---------------------------------------------------------|-----|
| By NEWSON & HARDING.                                    |     |
| Somers Town—9, Flouke-street, 38 years, ground-rent £10 | 210 |

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|-------------------------------------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                                                            |     |
| 9, Drummond-crescent, 12 years, ground-rent £5. 3s. and 4, the Polygon, 3 years, no ground-rent | 145 |

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|----------------------------------------------------------------------------------------------------------------------------------|-------|
| By NEWSON & HARDING.                                                                                                             |       |
| Suffolk, London—Stone Bridge Farm and 12a. 2r. 14p.; Sim's Farm and 83a. Or. 3p.; and Dane House and 42a. Or. 25p.; all freehold | 3,550 |

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|------------------------------------------------|-------|
| By NEWSON & HARDING.                           |       |
| Hornchurch Suits House, with grounds, freehold | 1,200 |

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|---------------------------------------------|-------|
| By NEWSON & HARDING.                        |       |
| Enclosures of land, 15a. Or. 25p., freehold | 1,425 |

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|------------------------------------------------------|-------|
| By NEWSON & HARDING.                                 |       |
| Prittlewell—St. Mary's Priory and 60 acres, freehold | 6,100 |

|                                                                               |     |
|-------------------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                                          |     |
| Dorset-square—44, Park-street, with stabling, 11 years, ground-rent £37. 11s. | 150 |

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|----------------------------------------------|-------|
| By NEWSON & HARDING.                         |       |
| Bermundsey—39 to 43, Edward-street, freehold | 1,260 |

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|-----------------------------------------|-------|
| By NEWSON & HARDING.                    |       |
| 14, 17, and 19, Edward-street, freehold | 1,180 |

|                                     |       |
|-------------------------------------|-------|
| By NEWSON & HARDING.                |       |
| 1 to 11 odd, Alice-street, freehold | 1,200 |

|                                      |       |
|--------------------------------------|-------|
| By NEWSON & HARDING.                 |       |
| 13 to 23 odd, Alice-street, freehold | 1,200 |

|                                      |       |
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| By NEWSON & HARDING.                 |       |
| 2 to 19 even, Alice-street, freehold | 1,870 |

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|-----------------------------------------------------------------------|-------|
| By NEWSON & HARDING.                                                  |       |
| 1 to 14, 17 to 22 5s. to 30, and 17a to 20a, William-street, freehold | 3,650 |

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|------------------------------------|-----|
| By NEWSON & HARDING.               |     |
| 20 to 24, Marigold-court, freehold | 990 |

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|-------------------------------------------|-----|
| By NEWSON & HARDING.                      |     |
| Spitalfields—21, Steward-street, freehold | 570 |

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|-------------------------------------|-----|
| By NEWSON & HARDING.                |     |
| Manor Park—9, Heston-lane, freehold | 245 |

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|-------------------------------------|-----|
| By NEWSON & HARDING.                |     |
| Clapham—16, Crescent-road, freehold | 300 |

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|-----------------------------------------------------------|-------|
| By NEWSON & HARDING.                                      |       |
| Park Hill, ground-rents, £58. 10s., reversion in 20 years | 1,870 |

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|-----------------------------------------------------------|-------|
| By NEWSON & HARDING.                                      |       |
| Park-place, ground-rents, £20. 6s., reversion in 16 years | 1,280 |

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|-----------------------------------------------------|-----|
| By NEWSON & HARDING.                                |     |
| Park Hill, ground-rents, £10, reversion in 31 years | 350 |

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|--------------------------------------------------------|-----|
| By NEWSON & HARDING.                                   |     |
| Bushey Heath—Two plots of land, 4a. Or. 16p., freehold | 800 |

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|-------------------------------------------|-----|
| By NEWSON & HARDING.                      |     |
| Two plots of land, 4a. Or. 30p., freehold | 750 |

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|--------------------------------------------------------------------------|-------|
| By NEWSON & HARDING.                                                     |       |
| Woodberry Down—The residence called Hillside, 77 years, ground-rent £24. | 1,300 |

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|-----------------------------------------------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                                                                      |     |
| Edgware-road—The reversion to 3 acres of freehold land, and a policy of £125. 1s. 2d., life aged 78 years | 680 |

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|------------------------------------|-----|
| By NEWSON & HARDING.               |     |
| Ealing—Four plots of freehold land | 395 |

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|-------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                        |     |
| Kentish Town—136, Kentish Town-road, a profit rental of £50 | 320 |

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|-------------------------------------------------------------------------------|-----|
| By NEWSON & HARDING.                                                          |     |
| Notting Hill—Landown-square, ground-rents of £14. 12s., reversion in 51 years | 465 |

#### MEETINGS.

SATURDAY, JULY 14.

Association of Municipal Engineers.—Annual meeting (continued). At 11 a.m., boat will be taken at the Temple Pier to proceed down the river to inspect (1) The Tower Bridge, (2) Greenwich Ferry, and (3) the new Outfall Sewage Works at Barking.

Architectural Association.—Visit to Layer Marney Towers and Church. Party to meet in the booking-office (main line), Liverpool-street, at 9.50 a.m.

Builders' Foremen and Clerks of Works' Institution.—Half-yearly meeting, 8.30 p.m.

#### Miscellaneous.

**A Commendable Example.**—It is with pleasure that we mention, as an illustration of the good feeling that should more generally subsist between employers and employed, that Messrs. Wyman & Sons, printers and publishers, Great Queen-street, Lincoln's Inn-fields (in whose office, by the way, the *Builder* has been printed from its commencement, forty-six years ago), have given a pension for life of 100l. per annum to Mr. W. H. Phillips, on his retirement from the post of case overseer, which he has filled for a great many years, having been for between forty and fifty years in the employ of the firm. Mr. Phillips is also held in great estimation by the employers, for, at a largely attended meeting the other evening, he was the recipient of their heartily-expressed good wishes, and of a costly marble timepiece and other gifts.

**Bablake Boys' School, Coventry.**—The Trustees of the above school have appointed Messrs. John Giles, Gough, & Trollope their architects to carry out these schools.



**A Proposed New Railway at Tooting.**—A new and much-needed railway is projected with the view of connecting Tooting with the Wimbledon and West End Railway to Putney and Victoria, now in course of construction, and also, by a branch, to the London and Brighton line at Streatham. By the first named line Tooting would obtain direct railway communication with South Kensington and the West End generally, and by the branch to Streatham would be placed in more direct communication with the City. At a crowded meeting in furtherance of the undertaking, held at the Vestry-hall, Tooting, last week, Sir John Heron Maxwell, who presided, stated that there was no suburban district about London so badly provided with railway accommodation as Tooting. It was, in fact, isolated at present, there being no railway within a mile and a half of the centre of the town, in consequence of which the place was suffering great inconvenience. There was a large number of houses unlet, and a very large quantity of building land undeveloped, owing to the difficulty of obtaining access by railway. Mr. J. W. Grover, C.E., who has laid out the proposed line, explained its features, and stated that there would be three stations, namely, one at Summers Town, Garratt-lane; another at High-street, Tooting; and a third near Tooting Beck Common. The line will be three miles in length. It was stated at the meeting that out of 190 land-owners along the line of route, 168 had promised to support it, and that only five had expressed anything like dissent. A committee was appointed to make the necessary arrangements preliminary to applying to Parliament for an Act sanctioning the construction of the line.

**International Association for the Protection of Human Life.**—At a recent meeting of the Council of this Association, Lord Suffield in the chair, it was resolved to form a guarantee fund to enable the building of a central museum and lecture theatre to be begun at an early date. The site of the proposed building adjoins the offices of the Association at Victoria Mansions, Westminster, and we hear that Mr. E. J. Farver is the architect. The objects which the Council have in view are:—To give a stronger impulse and a more systematic direction to all work tending to the better protection of human life; to facilitate the intercourse of those who interest themselves in this subject; to attract more general attention to the need of improved life-saving appliances; to promote legislation when necessary to the attainment of these objects; and to do this without interfering with the operations of other institutions, but so as to encourage a livelier interest in their work. It is also in contemplation to provide a permanent museum, and to hold exhibitions of all devices and appliances for the prevention of accidents causing personal injury or loss of life on land or sea.

**The Swedish Granite Industry.**—For the information of English owners of granite quarries, who of late years have been complaining more and more of foreign, chiefly Scandinavian, competition, it may be of interest to mention that the export of granite from Sweden and Norway to Germany, Denmark, and England, is, according to reports from Scandinavian consuls, steadily growing. This is no doubt due to the low cost at which the granite is obtained in Scandinavia, and the low rates of freight to foreign ports. The principal quarry in Sweden is that of Varburg, where the most beautiful pale-green stone is obtained. From this port alone 122 cargoes of granite were last year shipped for abroad; from other parts red and even black granite is shipped. In Berlin, Lubek, and Rostock there are now large works in which the granite is cut and polished for use in buildings, monuments, and statues. It may be added that the Gerbach granite works of Varburg are now delivering the pedestal, 30 ft. in height, for the new statue of Prince Frederick Charles, the famous "Red Prince," which is to be erected in Berlin.

**Bombay.**—Mr. F. W. Stevens, architect of the Indian Peninsular Railway Terminus buildings, has been appointed by the Corporation of Bombay to design and carry out the new Municipal Buildings to be erected in that city.

**The Board of Works Inquiry.**—We are compelled to hold over till next week our summary of recent evidence given before the Royal Commission appointed to inquire into the working of the Metropolitan Board of Works.

**The New Chapter Coffee House Buildings.**—One of the best-known of old City hosteleries, the Chapter Coffee House, is being entirely rebuilt, and during the last few days has been externally completed. The building has a frontage to Paternoster-row 50 ft. in length, with another frontage to Paul's-alley 49 ft. long. The Paternoster-row facade is 58 ft. in height to the apices of the gables, and 64 ft. in height to the ridge of the roof. The elevation has three main floors, with a dormer floor enclosed by the gables. The ground-floor portion of the frontage is entirely faced with Doubling stone, richly carved. At the angles and also on each side of the three entrances there are ornamental pilasters. This floor is surmounted by a massive stone cornice. The upper floors of the frontage are faced with red Fareham brick, Doubling stone being introduced for dressings and ornamentation. The first and second floors have each a range of six two-light mullioned windows. Beneath each of the first-floor windows there are prominent fluted canillevers, supporting a cornice at the foot of the second floor. At the angles, and also between each of the windows of the second floor, there are fluted columns and capitals, richly carved and moulded. Above this floor is a deep cornice and balustrade, surmounted by the two gables already named. The Paul's-alley frontage is uniform with the Paternoster-row elevation, with the exception of the gables. The interior of the building is intended to be elaborately fitted and decorated. The architects of the building are Messrs. Taylor & Locke, of Basinghall-street.

**Discoveries in Venice.**—The *Journal de Venice* states that during the works now in progress on the Square of St. Mark's, of relaying water-pipes and repaving, some interesting archaeological discoveries have been made. For instance, in almost the middle of the square a large water-cistern has been discovered, which is believed to date from the fifteenth century. This makes the fifth of these ancient cisterns found under the square from time to time. The remains have also been found of a huge sewer, similar to the well-known Roman one, *Gloaca maxima*, which are said to date from the tenth century. Of smaller objects found are coin, mosaic tablets, a bronze spoon from the Mediæval Age, and a water pitcher from the twelfth century.

**Sale of a Freehold Building Estate at Lee.**—Last week Messrs. Debenham, Tewson, & Co. offered for sale, at the Auction Mart, by order of trustees, the freehold residential and building estate known as Lee Lodge, Lee, situated on the high road from Lewisham to Lee. It comprises a family residence and well-timbered pleasure-grounds. The property has a frontage of over 400 ft. to the high road, and, it was stated, was ripe for building operations, and well adapted for the erection of shops and dwelling-houses. It covers an area of between two and three acres. It was sold for 4,000l., being at the rate of nearly 2,000l. an acre.

**An Exhibition of Workmen's Skill.**—An exhibition of the skill of workmen in their own trades will be opened at the Crystal Palace on August 18th, in connexion with the National Co-operative Festival. The competition will be amongst working men members of the Industrial Co-operative Societies throughout the kingdom, and special facilities for competing will be offered to them by their respective societies agreeing to pay carriage on all exhibits. The Council of the Society of Arts, who have promised to appoint the judges, will award one of their bronze medals in eighteen of the principal classes.

**Improvements for Avonmouth.**—A Local Government Inquiry was held at the Royal Hotel, Avonmouth, on the 27th ult., by Colonel W. M. Ducat, R.E., to consider an application made by the Barton Regis Union Rural Sanitary Authority to borrow 2,000l. for making several streets at Avonmouth. The meeting was attended by the Surveyor, Mr. A. P. J. Cotterill, Assoc.-M.Inst.C.E., who explained the plans.

**Cologne.**—An International Exhibition of Horticulture is to be held at Cologne, from August 4th to September 9th. The Exhibition will include garden architecture, plans and designs for gardens, models and exhibits of hot-houses, conservatories, summer-houses, garden furniture, &c. The Exhibition is in celebration of the twenty-fifth anniversary of the "Flora" Company at Cologne.

**The Irish Exhibition in London.**—A fancy fair is to be held in the old Market Place at the Irish Exhibition next week. It will open on Tuesday, the 17th inst., at three o'clock, and remain open the three following days. As there will be additional attractions in the Exhibition itself, it will be a good opportunity for paying a visit to "Olympia."

**Value of a West-End Building Site.**—The freehold building site at the corner of Pantoon-street and Oxendon-street, containing a superficial area of 1,575 ft., and having a frontage to Pantoon-street of 21 ft. and to Oxendon-street of 39 ft., has just been sold by Messrs. Beal, Son, & Chartres for 4,850l. The purchase-money represents upwards of 3l. per foot.

**Jubilee Clock Tower at Brighton.**—The ceremony of unveiling a Jubilee clock tower, presented by Mr. James Willing to Brighton, at a cost of 2,000l., took place on the 27th ult. The tower is situate at the bottom of Queen's-road. The architect is Mr. J. Johnson.

**Clock, Baconthorpe, Norfolk.**—A large clock has just been erected in the church tower here by Messrs. John Smith & Sons, of Derby. It has one face 5 ft. across, and strikes the hours.

**Duty on Tiles and Bricks in Sweden.**—The Swedish Parliament has put a duty on tiles of all kinds, and fireproof bricks, above 3 cm. in thickness, of 20 öre (3d.) per 100 kilos.

**Raffety, Thornton, & Co., Limited.**—The directors of Raffety, Thornton, & Company, Limited, have declared an interim dividend at the rate of 7 per cent. per annum.

| PRICES CURRENT OF MATERIALS.          |           |    |    |    |    |    |    |
|---------------------------------------|-----------|----|----|----|----|----|----|
| TIMBER.                               |           |    |    |    |    |    |    |
|                                       |           | £. | s. | d. | £. | s. | d. |
| Greenheart, B.G.                      | ton       | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                            | do        | 8  | 0  | 0  | 12 | 10 | 0  |
| Sequoia, U.S.                         | foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Birch, Canada                         | do        | 2  | 15 | 0  | 4  | 15 | 0  |
| Fir, Dantsie, &c.                     | do        | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                   | do        | 2  | 0  | 0  | 4  | 10 | 0  |
| Canada                                | do        | 4  | 0  | 0  | 6  | 10 | 0  |
| Pine, Canada red                      | do        | 2  | 10 | 0  | 3  | 10 | 0  |
| " yellow                              | do        | 2  | 10 | 0  | 4  | 0  | 0  |
| Lath, Dantsie                         | fathom    | 3  | 10 | 0  | 8  | 0  | 0  |
| Do " Petersburg                       | do        | 5  | 0  | 0  | 8  | 0  | 0  |
| Waustror, Odessa, crown               | do        | 2  | 10 | 0  | 3  | 0  | 0  |
| Deals, Finland, 2nd and 1st, std. 100 | do        | 5  | 0  | 0  | 9  | 10 | 0  |
| " 4th and 3rd                         | do        | 6  | 10 | 0  | 7  | 10 | 0  |
| Riga                                  | do        | 6  | 0  | 0  | 7  | 10 | 0  |
| St. Petersburg, 1st yellow            | do        | 9  | 10 | 0  | 11 | 10 | 0  |
| " 2nd                                 | do        | 8  | 0  | 0  | 17 | 0  | 0  |
| " white                               | do        | 7  | 0  | 0  | 10 | 0  | 0  |
| Swedish                               | do        | 7  | 0  | 0  | 15 | 10 | 0  |
| White Sea                             | do        | 8  | 0  | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                     | do        | 11 | 0  | 0  | 23 | 0  | 0  |
| " 2nd                                 | do        | 9  | 0  | 0  | 16 | 0  | 0  |
| " 3rd, &c.                            | do        | 7  | 6  | 0  | 9  | 10 | 0  |
| " Spruce, 1st                         | do        | 8  | 0  | 0  | 10 | 0  | 0  |
| " 3rd and 2nd                         | do        | 6  | 0  | 0  | 7  | 10 | 0  |
| New Brunswick, &c.                    | do        | 6  | 0  | 0  | 7  | 5  | 0  |
| Battens, all kinds                    | do        | 4  | 10 | 0  | 11 | 0  | 0  |
| Flooring Boards, sq. ft. 1 in., pre-  |           | 0  | 10 | 0  | 0  | 12 | 0  |
| pared, 1st                            | do        | 0  | 7  | 0  | 0  | 9  | 6  |
| " 2nd                                 | do        | 0  | 4  | 0  | 0  | 6  | 0  |
| Other qualities                       | do        | 0  | 4  | 6  | 0  | 6  | 0  |
| Cedar, Cuba                           | foot      | 0  | 0  | 34 | 0  | 0  | 4  |
| Honduras, &c.                         | do        | 0  | 0  | 33 | 0  | 0  | 33 |
| Australian                            | do        | 0  | 22 | 0  | 0  | 34 | 0  |
| Malagasy, Cuba                        | do        | 0  | 0  | 48 | 0  | 0  | 0  |
| St. Domingo, cargo average            | do        | 0  | 0  | 48 | 0  | 0  | 6  |
| Mexican                               | do        | 0  | 0  | 4  | 0  | 0  | 44 |
| Tobacco                               | do        | 0  | 0  | 44 | 0  | 0  | 0  |
| Honduras                              | do        | 0  | 0  | 44 | 0  | 0  | 0  |
| Rose, Rio                             | ton       | 8  | 0  | 0  | 11 | 0  | 0  |
| Box, Turkey                           | do        | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian                       | foot      | 0  | 0  | 4  | 0  | 0  | 55 |
| METALS.                               |           |    |    |    |    |    |    |
| IRON—Bar, Welsh, in London            | ton       | 4  | 17 | 6  | 5  | 0  | 0  |
| " at works in Wales                   | do        | 4  | 7  | 6  | 4  | 10 | 0  |
| " Staffordshire, London               | do        | 5  | 5  | 0  | 7  | 0  | 0  |
| COPPER—                               |           |    |    |    |    |    |    |
| British, cake and ingot               | ton       | 73 | 0  | 0  | 75 | 0  | 0  |
| Best selected                         | do        | 73 | 0  | 0  | 76 | 0  | 0  |
| Sheets, strong                        | do        | 82 | 0  | 0  | 0  | 0  | 0  |
| Chub, bars                            | do        | 81 | 0  | 0  | 81 | 10 | 0  |
| YELLOW METAL, &c.                     | lb.       | 0  | 75 | 0  | 0  | 75 | 0  |
| LEAD—                                 |           |    |    |    |    |    |    |
| Pig, Spanish                          | ton       | 13 | 0  | 0  | 0  | 0  | 0  |
| English, common brands                | do        | 13 | 5  | 0  | 13 | 10 | 0  |
| Sheet, English                        | do        | 14 | 5  | 0  | 0  | 0  | 0  |
| SPRINTER                              |           |    |    |    |    |    |    |
| Sliver, special                       | ton       | 0  | 0  | 0  | 0  | 0  | 0  |
| Ordinary brands                       | do        | 0  | 0  | 0  | 13 | 0  | 0  |
| TIN—                                  |           |    |    |    |    |    |    |
| Strait                                | ton       | 83 | 10 | 0  | 0  | 0  | 0  |
| Australian                            | do        | 83 | 10 | 0  | 0  | 0  | 0  |
| English Ingots                        | do        | 90 | 10 | 0  | 0  | 0  | 0  |
| ZINC—                                 |           |    |    |    |    |    |    |
| English sheet                         | ton       | 19 | 0  | 0  | 19 | 10 | 0  |
| OILS.                                 |           |    |    |    |    |    |    |
| Linsed                                | ton       | 18 | 2  | 6  | 18 | 5  | 0  |
| Cocunut, Cochon                       | do        | 23 | 0  | 0  | 27 | 0  | 0  |
| Ceylon                                | do        | 20 | 0  | 0  | 22 | 5  | 0  |
| Palm, Lagos                           | do        | 20 | 0  | 0  | 20 | 10 | 0  |
| Rapessed, English pale                | do        | 24 | 0  | 0  | 0  | 0  | 0  |
| " brown                               | do        | 23 | 10 | 0  | 0  | 0  | 0  |
| Cottonseed, refined                   | do        | 20 | 5  | 0  | 0  | 0  | 6  |
| Tallow and Oleine                     | do        | 25 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S.                     | do        | 6  | 15 | 0  | 6  | 0  | 0  |
| " refined                             | do        | 7  | 0  | 0  | 12 | 0  | 0  |
| TRAPLITE                              |           |    |    |    |    |    |    |
| American, in casks                    | cwt.      | 1  | 9  | 0  | 0  | 0  | 0  |
| TAR—                                  |           |    |    |    |    |    |    |
| Stockholm                             | barrel    | 0  | 15 | 0  | 0  | 0  | 0  |
| Archangel                             | do        | 0  | 8  | 6  | 0  | 0  | 0  |



|                                  |             |   |   |    |   |   |
|----------------------------------|-------------|---|---|----|---|---|
| King Bros. & Co., South Norwood† | 799         | 0 | 0 | .. | 8 | 0 |
| * Per cubic yard.                | † Accepted. |   |   |    |   |   |

**SOUTHWARK.**—For a section of proposed new factory in Southwark Bridge and Borough roads, for Messrs. Day & Martin, Mr. W. G. Bower, F.R.I.B.A., architect.  
Quantities by Messrs. Gardiner, Son, & Theobald:—

|                                   |             |
|-----------------------------------|-------------|
| John Garlick                      | £15,117 0 0 |
| P. & F. J. Wood                   | 14,953 0 0  |
| Isaiah Bros.                      | 14,700 0 0  |
| H. M. Dove                        | 14,680 0 0  |
| Edmund Toms                       | 14,592 0 0  |
| Servier & Co.                     | 14,570 0 0  |
| Mowlem & Co.                      | 14,450 0 0  |
| J. O. Richardson                  | 14,450 0 0  |
| Gould & Brand                     | 14,296 0 0  |
| J. T. Chappell                    | 14,253 0 0  |
| T. L. Green                       | 13,187 0 0  |
| James Goldie & Son                | 14,180 0 0  |
| Jackson & Todd                    | 14,100 0 0  |
| E. C. Howell & Son                | 13,998 0 0  |
| Deacon & Co.                      | 13,984 0 0  |
| Foster & Dickson                  | 13,995 0 0  |
| Staines & Son                     | 13,994 0 0  |
| James Holloway                    | 13,950 0 0  |
| H. Potter                         | 13,950 0 0  |
| H. L. Holloway                    | 13,850 0 0  |
| W. L. K. Hawley                   | 13,580 0 0  |
| Geo. Stephenson                   | 13,528 0 0  |
| Hughes & Stirling                 | 13,795 0 0  |
| P. & F. H. Higges                 | 13,779 0 0  |
| Allen & Sons                      | 13,673 0 0  |
| W. Shurmer                        | 13,770 0 0  |
| Brickell                          | 13,559 0 0  |
| Mark Gentry                       | 13,536 0 0  |
| Brass & Son                       | 13,397 0 0  |
| Stanley G. Bird                   | 13,300 0 0  |
| Kirk Bros.                        | 13,298 0 0  |
| Rick & Randall                    | 13,098 0 0  |
| Wm. Downs (accepted)              | 12,787 0 0  |
| Patman & Petheringham (withdrawn) |             |
| B. E. Nightingale (too late)      |             |

**SOUTHWARK.**—For buildings in Princess-street, Union-street, for Messrs. Hayward Bros. & Eckstein, Messrs. Hy, Jarvis & Son, architects:—

|                      |            |
|----------------------|------------|
| Cole & Sons          | £2,115 0 0 |
| W. Johnson           | 2,100 0 0  |
| H. L. Holloway       | 1,919 0 0  |
| B. E. Nightingale    | 1,903 0 0  |
| W. Downes            | 1,877 0 0  |
| Holliday & Greenwood | 1,885 0 0  |
| J. Holloway          | 1,878 0 0  |
| E. Lawrence & Sons   | 1,821 0 0  |

**WADSWORTH.** For works at Snape Farm, Wadsworth, for Mr. Geo. Berham, Mr. Robert P. Whellock, architect, 17, Fenchurch-lane, Quantities supplied by Messrs. Franklin & Andrews, 25, Ludgate-hill, London, E.C.:—

|                                 |            |
|---------------------------------|------------|
| H. Adam, Tunbridge Wells        | £6,300 0 0 |
| W. Downes, London               | 6,432 0 0  |
| W. H. Canty, Tunbridge Wells    | 6,119 0 0  |
| Dove Bros., London              | 6,115 0 0  |
| Strange & Sons, Tunbridge Wells | 6,064 0 0  |
| E. Thurbon, Tunbridge Wells     | 6,064 0 0  |
| F. Piper, Hawkhurst             | 5,678 14 7 |
| Beale & Sons, Tunbridge Wells   | 5,469 0 0  |

**WATFORD (Herts).** For new house and shop at Chalk Hill, for Mr. Reynolds Vale, Mr. C. P. Ayres, architect, 52, High-street, Watford:

|                                      |          |
|--------------------------------------|----------|
| P. Turner, Limited, Watford          | £849 0 0 |
| J. Pratt, Watford                    | 799 0 0  |
| C. Brightman, Watford                | 797 0 0  |
| Clifford & Gough, Watford            | 777 0 0  |
| Andrews & Sons, Watford              | 759 0 0  |
| F. Dupont, Colchester                | 750 0 0  |
| G. Dorve, Watford                    | 737 0 0  |
| H. M. Dove, Watford                  | 735 0 0  |
| Judge & Barnes, Watford              | 732 0 0  |
| G. & J. Waterman, Watford (accepted) | 727 0 0  |
| W. B. Neal, Watford (too late)       |          |
| G. Sear, Watford (withdrawn)         |          |

**WIGSTON MAGNA.**—For alterations and additions to schools in Long-street, Wigston Magna, near Leicester. Messrs. R. J. & J. Goodacre, architects, Leicester:—

|                            |             |
|----------------------------|-------------|
| T. Brown, Wigston Magna    | £2,999 12 7 |
| C. Hurst, Wigston Magna    | 2,998 0 0   |
| C. E. Sharp, Wigston Magna | 2,820 0 0   |

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# The Builder.

Vol. LV. No. 2372.

SATURDAY, JULY 21, 1888.

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### The Society for the Protection of Ancient Buildings.



THE Annual Report of this Society commences with the usual confession, which crops up again from time to time in the course of the Report, that the Society has in a large number of cases failed to get any attention paid to its remonstrances or opinions. The reasons for this are probably threefold. In some cases there is no doubt that mistaken views or absolute indifference on the part of the custodians of ancient buildings lead to their being obstinately deaf to any suggestions from any quarter as to the value of an old building, and regarding it simply as their own property, to pull about as they please. Legally it may be so, but morally it is not; and we are as strongly of opinion as the Society can be that ancient buildings ought to be regarded by their legal owners as objects of national interest, the treatment of which should be regulated by considerations much wider than the mere question of what pleases the fancy of the present owner. But the other two causes which operate to render people indifferent or actively hostile to the interference of the Society are,—first, the utterly illogical and unreasoning manner in which the Society classes together all cases of restoration, without reference to the practical uses of the building; and, secondly, the offensive tone of superiority which characterises its remarks and criticisms, and which is as apparent as ever in this last Report. In the remarks on the case of Hucknall Torkard Church, in Nottinghamshire, it is naively observed that the Chancellor of the Diocese did not recognise the *locus standi* of the Society to appear in the case, and consequently gave the faculty for enlarging the church. Why should he recognise it? The Society is a self-constituted body of private persons of somewhat narrow views, very strong prejudices, and with a remarkably good opinion of themselves,\* and there is no reason why they should expect that they should be recognised as a body entitled to interfere. The

case of this church was that the parish voted for this enlargement, we presume for the practical reason that it was not large enough for the population, as no other reason is suggested, and no other seems probable. Whereupon the Society steps in, and endeavours to oppose the granting of the Faculty for enlargement, on the ground that Byron was buried in the chancel, and that the church stands in old Sherwood Forest, "and is connected with the Robin Hood legends still dear to Nottinghamshire people"; so that on this account the inhabitants are not to enlarge the church in which they worship. It is admitted in the Report that the tombs of the Byrons have not been disturbed, "but the tablets to some members of the family have been removed"—and lost or destroyed? Not at all:—"and refixed." The Society would apparently prefer that the parishioners should have too small a church to accommodate them, rather than that some tablets to those who are dead should be re-fixed in another situation. It is not surprising if interference in such a spirit, by a body with no official standing, should be regarded as little better than sentimental impotence.

The real view of the Society, as it is to be gathered from their own reports, amounts in fact to this, that the historical interest in architecture is everything, the practical use and architectural design nothing; and they appear to be perfectly incapable of discriminating between cases where present needs render enlargement and repair necessary, and those in which the question is merely of the preservation of an ancient relic in which the historical interest alone need be considered. They cannot possibly see that what is right in the latter case may be wrong and even ridiculous in the former. Thus, in the case of Frithelstock Priory, in Devonshire, which is a ruin, and which Lord Clinton's agent thought it would be necessary to pull down owing to its insecure condition, the Society advised some repairs which would suffice to render the remains safe without interfering with their archaeological value. This, we understand, has been done according to their programme; and here they, no doubt, were perfectly right and reasonable, and have done good service. But the Society can draw no line between this case and that of Dunblane Cathedral, for example. This is an ancient deserted cathedral still in tolerably good condition as to its main fabric, and the population of the district have conceived the nefarious idea of repairing and restoring it sufficiently to put

it to its old use. They want a large church, and here is an old and grand one, with all the associations of age, ready to their hand, and only requiring to be repaired and put into condition. From the religious standpoint (with which we do not intermeddle here) it might be thought that there was something inspiring in the idea of the old fane, long empty to the winds, once more consecrated to worship, and echoing the sound of hymns and prayers. But this is nothing to the Society; the religious uses and ends of a church are of no moment at all; it is an "ancient building," and must not be touched even to put it again to the use for which it was originally built. "A very large amount of the Committee's time has been expended upon opposing the scheme for bringing the nave again into use. . . . It is to be hoped that next year we may be able to state that the scheme has been abandoned, and in the meantime we will ask our members to do their utmost to weaken it by stopping funds from being contributed, and in every other way which may be in their power." It is difficult to understand the existence of such aesthetic bigotry; certainly difficult to speak of it with any patience.

In the case of Acton Burnell Church, Shropshire, it would appear that "they" (a vague phrase, which seems to mean the rector and churchwardens) "seem to be disregarding the advice given in the Society's Report in every particular." Part of the work thus commented on consisted in opening an old window which had been bricked up, so that we presume this is a piece of vandalism, old bricks being in themselves precious heirlooms not to be wantonly desecrated, even when they block up a window. "The plaster is all going to be taken off the walls, but a protest has extracted a promise that the walls shall be re-plastered." The meaning of these sarcastic italics may not be apparent to the general reader, but the fact is that old plaster is also a sacred institution, and is not to be removed from a wall. See the changes of æsthetic fashion! Thirty years ago, the very same people who are now worshipping old plaster would, if they had happened to be born at that time instead of this, have been clamouring for the removal of all plaster from Mediæval walls. The paragraph on Barney Church, Norfolk, is amusing. It seems that the Rector of that church, which has never been "restored," endeavoured to get professional advice from the Society at the cost of paying the railway fare of their architect, the reverend gentleman shrewdly calculating that thereby he

\* We do not necessarily mean this of all the members and subscribers, many of whom are moderate men enough, but of those who take the prominent part in acting for the Society.



would get an architect's advice without paying any fee for it. The Committee (very rightly) declined sending an architect down except to meet his architect, and learned that he had no intention of employing one. The Committee then wrote and urged most strongly the importance of an architect being employed, "but we fear our advice has not been followed." In this case we approve of the action of the Society, but it is not consistent with the sneers at architects which abound in other pages of the Report, and with the insinuation that architects incite people to go in for over-restoration in order that their own fees may be increased. Remarks of this kind look rather as if they were inspired by some architect who has no practice himself, and relieves his feelings by throwing stones at those who have.

The case of Heckington Church, "where everything has been done in exact contradiction to the advice which the Society always gives" (a result which the Society seems quite to enjoy publishing), is not so simple as some of the others. We have not seen the church since the later restorations here referred to, in the chancel; we have a recollection of some very bad restoration work in the nave many years ago, and of the walls being pointed with black mortar in a way that made them look as if covered with a Brobdingnagian spider's web. We should fear, from the description quoted, that the chancel must have a very Southampton-street *cachet* about it now, knowing, as we do, the kind of "orthodox church-fitting" way in which these renovations are too often carried out. But on the question of principle, all the things that have been done are not necessarily wrong in themselves. "The sacristy has been completely restored. It consists of an upper and lower chamber. A groined roof has replaced the lath-and-plaster ceiling of the lower chamber, and upon this the new tiled floor of the upper chamber, used as the vestry, rests." The complaint of the Society, we presume, would be that the lath-and-plaster ceiling was genuine work of its date, and the new groined roof is imitation Gothic. Now if Heckington Church had fallen into such dilapidation that it had to be pulled down, or had fallen down bodily, we should be the first to protest against any idea that it could be replaced by building up a new Heckington Church in precise imitation of the old one. But when it comes to treating a small portion of an old edifice, the question of architectural consistency of design comes in. A lath-and-plaster ceiling is certainly a very mean and unsuitable feature in a mediæval church; it was very likely in a dilapidated state, and the replacing it with a feature harmonising with the style of the rest of the church is in accordance with architectural consistency. Architecture is design as well as history, a view which the Society seems to have entirely thrown overboard. In the case of another church, they more than hint that the restoration of the pinnacle terminations to a tower, which had gone, leaving only their bases, would be a mistake: the point is open to discussion, but the reasonable view appears to us to be that this was a termination necessary to complete the architectural design, and which had been removed by violence (most likely), and that to complete it afresh in harmony with the rest of the structure is a perfectly reasonable thing from an architectural point of view. In the case of Heckington, again, one of the sins has been to open a new door through the west wall, so as to give access to the vestry without passing through the church, a proceeding which, it is observed, "would not even be justified from the 'restorers' point of view." No more it would, and that is just the reason we approve of it. It is perfectly right from an architect's point of view, as the provision for practical convenience, which is part of the architect's business. The men who built Heckington Church would have had no scruple in cutting a door anywhere in an older piece of work, if they had wanted one. The contrary idea is an absurdity such as was never heard of till the present day.

In the matter of Irthlingborough tower we are entirely of the mind that every effort should

have been made to save so peculiarly picturesque and interesting a tower: but was it possible? When we saw it some years ago it was in a very dilapidated condition, propped and buttressed, and we should hesitate to accept the Society's assurance that it could have been saved. It is a melancholy loss, at all events, and we quite concur that it is no use to talk in such cases of pulling down and rebuilding a structure of that kind in order to save it. It is not the same thing when rebuilt; and the quotation from a Report written by a foreign member of the Society,—"One ill contributes to the preservation of an ancient building, beginning by demolishing it," is quite to our mind. But then the evidence of the Society is apt to be so exceedingly one-sided in these matters. In reporting on another church, they say "the new truss-timbers in the aisle roof were not necessary, the old ones being sufficiently good and available." They said the same of St. Alban's nave roof, which they had never seen, and which, in fact, was an absolute wreck. Then, "deal or pine has been mostly used for the roofs instead of oak, this treatment being contrary to the advice of the Society." Probably the restorers would have been most happy to use oak if the Society would have found the money for it.

We feel considerable sympathy with the protest made against the jamming up of Westminster Abbey with scaffolds for the Jubilee festival. It certainly involves great danger of damage to a building the interest and value of which is unique in England, and we agree entirely with the remarks in regard to the vulgar maltreatment to which the ancient Coronation chair was subjected in preparation for the same occasion. With much, also, of the special report in regard to St. Mark's, Venice, signed by Professor Middleton and Mr. Wardle, we cordially agree, especially as to the treatment of the mosaics, and the strong desire expressed that every means should be used to retain the original mosaics in their place, instead of indulging in the futile idea of reconstructing the more dilapidated portions in new material, from what is left of the old design. That is neither one thing nor another, neither old nor new. Preserve the old with every care as long as possible, and where it is so gone that it cannot be preserved, replace it with the best modern art available, in harmony as far as may be with the old, but not in attempted imitation of it. This portion of the Report, in fact, we read with almost entire sympathy, and it is written in a far more reasonable spirit than the rest.

"The action of the Society," we are told, "has been very much hampered during the past year from want of the necessary funds for carrying out its work"; and we cannot wonder at this. The Society's own annual Reports are calculated far more to alienate than to invite the subscriptions of reasonable people among the outside public. Year after year they bring out these Reports, full of complaints (which, as before observed, they seem rather to glory in) that no one attends to them; that they cannot get their wishes carried out, and in many cases cannot even get answers to their letters; and fall of indications of their own unreasonable and intolerant views and their total want of comprehension of the artistic and practical side of architectural work. If they really wish to get the confidence of the public and to encourage subscriptions in aid of their work, which is no doubt meant well, our advice to them would be to publish no more Reports. "The Protection of Ancient Buildings" is in itself a noble object, and this style and title might avail to attract the assistance and sympathy of many who would be only repelled or idly amused by the curious exhibition of feebleness, confusion of ideas, and unpractical sentimentality, which the annual Reports of the Society bring before them.

**Archæological Researches in Peru.**—A Peruvian journal states that a syndicate, with a capital of 8,000l., has been in Peru, for the purpose of excavating the ancient burial-places at Cuzco, which are known to be rich in prehistoric remains. A concession has been obtained from the Government.

#### METROPOLITAN SEWAGE.



THE Reports of Sir Henry Roscoe to the Metropolitan Board of Works, which we printed last week, show that both the sewage itself and the gases and vapours which arise from it must be oxidised, and that the oxidation in both cases must be effected by atmospheric air. The contact of free oxygen with the sewage has the result of rendering the organic matter inoffensive. The bad smells along the lines of sewer proceeding to the outfall have been somewhat reduced during the last two or three years by deodorants, at a cost of 40,000l. a year; but it is a temporary remedy, and does not affect the nature of the sewage at the outfall, the quantity added being quite insufficient to oxidise even a small part of the putrescent matter which gives rise to the emanations. If the water of the Thames where the sewage is discharged into it were unpolluted it would contain sufficient free oxygen to render the sewage inoffensive; but it is not so, and no further amount of oxidising chemical which might be added to the sewage can restore the river water to its normal condition. This brings Sir Henry Roscoe to consider whether the end cannot be attained by the aëration of the sewage before it enters the river. The cost of pumping air through the sewage need not, he says, be considerable, and he believes that this may turn out to be a solution of the problem. At any rate, he feels sure that it is a matter well deserving of further inquiry. It certainly is, but we expect the inquiry would result in the recommendation to take the sewage to the air rather than to force air through it at Barking or Crossness. It is not the first time that it has appeared desirable to aërate sewage by bringing it into close and minute contact with air, but the difficulty of operating upon a mass of sewage in a reservoir has hitherto made it appear the better way to take the sewage further from the town, and spread it over a more extended area, either in the condition in which it arrives by the sewer, or after the coarser part of the solid matter has been removed from it; but after so long a travel as the metropolitan sewage must have, it would probably arrive at its destination in a condition to be at once run over the land. That, however, is a detail involving no difficulty. The real difficulty is in obtaining a sufficient area of land, but it need not be all in one place; there might be an abundance of suitable land within reach of the metropolitan sewage had not the absurd idea of concentration of the sewage at one spot rendered the utilising of much of this area practically impossible. To dispose of 156,800,000 galls. a day it should be divided into numerous outlets. Concentration of a large amount of work in one establishment tends to economy of working in most things, but sewage disposal is not one of them; or, at any rate, is not a suitable business for the application of that principle, although, in respect of economy of working alone, it would follow the general rule, no doubt.

But that, it need hardly be said, is not the chief consideration. The nuisance created by discharging the metropolitan sewage into the Thames at Barking and Crossness under the present conditions must evidently be made to cease, by some means; and if Sir Joseph Bazalgette can blow air through the sewage in sufficient quantity to satisfy Sir Henry Roscoe, it may answer the purpose, if the residual deoxidised air blown out will do no harm to the neighbourhood; or if,—but this is a chemical question we hardly dare touch upon,—the necessary oxygen can be previously disengaged from the air; and if so, we should suppose it would be preferable to bring it to the works from a distance; from the open country or the sea-side; and in either case the plan might be cheaper than that of taking the sewage to the land. Sir Henry Roscoe says in his "general conclusions" that, looking at the broad question of the permanent disposal of the metropolitan sewage, and believing that the use of deodorants ought to be regarded only as a temporary expedient, he feels convinced that sooner or



later the recommendations of Lord Bramwell's Commission, 10 and 13 in their Report, will have to be adopted, and that the sewage, whether previously clarified or not, must either be filtered through land or discharged into the estuary at a point not higher than Sea Reach.

The recommendations referred to are those, we suppose, of the second and final Report, viz.:—(10) "But we believe that the liquid, so separated, would not be sufficiently free from noxious matters to allow of its being discharged at the present outfalls as a permanent measure. It would require further purification; and this, according to the present state of knowledge, can only be done effectually by its application to land"; and (13) "If suitable land, in sufficient quantity and at reasonable cost, cannot be procured near the present outfalls, we recommend that the sewer liquid, after separation from the solids, be carried down to a lower point of the river, at least as low as Hole Haven, where it may be discharged. In this case, it will also be advisable that the liquid from the southern sewage should be taken across the river, and the whole conveyed down the northern side. It may be found that the separating process can be effected more conveniently at the new than at the present outfalls." What would be considered by Lord Bramwell's late Commission sufficiently near the present outfalls, for land upon which to dispose of the sewage, does not appear. They probably had the idea that it must lie all together, and so saw a difficulty in procuring a sufficient quantity; or, if not altogether so, at least for each side of the river; but we should not look at the question in that light, whether near or far from the present outfalls. The difficulty in procuring land may be greater on one side of the river than on the other, and if, on that account, crossing the river would be advisable, there would be no difficulty in it; but whether on one or both sides of the river, the sewage should be conveyed to suitable land, though not necessarily in one area.

Whatever may be the result of these Reports, as they affect the question of treatment of the metropolitan sewage, we consider that a distinct advance has been made in the treatment of sewage generally by the recognition of an eminent chemist that sewage and atmospheric air should be brought into close and minute contact in detail; and this is true alike of the sewage itself and the gases and vapours which arise from it. The attempts to deodorise the sewage at numerous places with manganate of soda or with chloride of lime, and so to prevent bad smells arising from the openings at the ground level, are both expensive and ineffectual. With a proper system of ventilation these would become, as they were probably intended to be originally, air inlets instead of outlets. Ventilation of the sewers is especially mentioned in the fourth paragraph of Sir Henry Roscoe's Report of the 10th June, 1887.

#### NOTES.

**T**HE Standing Committee on Trade concluded the consideration of the Railway and Canal Traffic Bill on Monday last. Mr. Mundella and Mr. Chamberlain have been among the most prominent contributors to the discussions which have taken place upon this measure, and have proved that their past experience has given them a good grasp of the subject. Several useful suggestions have emanated from these gentlemen, smoothing the road where there has been a conflict of opinion. Sir Michael Hicks-Beach has also made it evident that he has studied the question to good purpose during the short period which has elapsed since the Bill was committed to his charge. Some of his proposals, however, were received with decided disfavour,—notably a clause giving the Commissioners certain powers as to fixing through rates, which was eventually withdrawn altogether. Another new clause introduced by the right hon. gentleman, limiting the damages recoverable under the Act, was ruled out of order. The important question of truck rates was raised at the sitting of the 12th inst. on the following proposal by Mr. Hunter, who

has been very active on the committee throughout:—"The Commissioners may, upon the application of any person interested in any particular description of traffic, order any railway company to convey such traffic at such reasonable rate per truck per mile as the Commissioners may determine." In the discussion that followed, the general feeling appeared to be rather against the proposal; and, seeing that the adoption of the clause would probably give rise to a lengthy debate upon the Report, it was deemed advisable for it to be withdrawn. At the last sitting of the Committee a tie took place on a division as to the adoption of a new clause for the transfer of certain business to the Railway Commission from other Courts, the clause being negatived by the casting vote of the Chairman. Sir Matthew White Ridley has proved a most capable and impartial chairman, and the Committee may be congratulated upon the result of their work. The value of the new system of delegating such business as this to Standing Committees instead of occupying the time of the whole House with it has been fully established, as Mr. W. H. Smith,—who was at one time very averse to it,—has been constrained to admit. The remaining stages of the Bill will be dealt with as rapidly as the state of Parliamentary business will allow, and it will, in all probability, become law this session.

**T**HE important debate which took place in Committee on the Local Government Bill on Wednesday, on Mr. Channing's proposed clause for providing for a partition of rate charges between owners and occupiers of property, is gratifying in so far as it showed that there is among many members of Parliament a strong feeling in regard to the monstrous injustice inflicted on tenants of London property under the present system and under present circumstances, when immense improvements of every kind have been carried out, raising the value of property everywhere, of all which the owners will reap the benefit without having contributed a penny towards them. The majority of the speakers in the debate were of the same mind, and evidently thought the present state of things indefensible; but we are not the least surprised that the clause was negatived, nor do we regret it, for the simple reason that the subject is far too large and complicated to be dealt with by a mere addition to a Bill which is already of formidable character enough in regard to the complication of interests with which it deals, and the multifarious changes which it will bring about. The question of rating reform demands a separate Act, but the debate of Wednesday night is satisfactory as indicating what a good chance there is of passing a strong measure of reform within no very long period.

**A**N important deputation waited on the First Commissioner of Works on Tuesday to protest against the proposition to allot a portion of Richmond Park for the annual contests of the National Rifle Association. The principal speakers were Sir Whittaker Ellis and Mr. Burt, the latter a member of the Richmond Vestry; the Earl of Fife also spoke in support of the protest of the residents of the neighbourhood; and Lord Middleton, in the capacity of High Steward of Kingston. The general argument, however, amounts simply to this, that the transference to Richmond Park of what has hitherto been known as the Wimbledon Meeting would infallibly spoil the beauty of the Park, and its enjoyment by the public. It has also been suggested that the site was not a safe one for rifle-firing at long ranges, having regard to the great carrying power of the modern rifle in the case of shots which might be so wide of the mark as not to be stopped at the butts; and we should be disposed to think this danger was by no means imaginary, though it may not be as great as some nervous people suppose. But of the substantial injury to the Park, as a beautiful pleasure-ground, which the establishment of the rifle meeting there would cause, we have not the slightest doubt, and we join most

strongly in the protest against it. We say this with the greatest possible sympathy with the Rifle Association, and with the Volunteers generally, but we do not think Richmond Park is the place for them, either in their own interests or in those of the public. A letter from the Colonel of the Queen's Westminster Volunteers, in the same number of the *Times* in which the report of the deputation appears, suggests that a great step in the work of the National Rifle Association might be made if a site could be found tolerably central among the southern counties, and within convenient rail distance of London, for the establishment of a permanent camp for drill exercise and class firing, with sufficient permanent ranges for allowing of extensive practice at all times of the year. That would be a far better thing to aim at than spoiling Richmond Park by an annual meeting.

**I**T appears that although there is a very general opinion in the country that canals should cease to belong to railway companies, at least to the extent to which they now do, and that the new County Councils and the Corporations of large towns should take part in promoting their more extended use by the public, sufficient strength has not yet been brought into Parliament to convince the Government that an opportunity should be given to these public bodies to carry out the public desire, for Mr. P. Stanhope's motion the other day in the Standing Committee on Trade met with no support from the President of the Board of Trade, nor did the suggestion of Mr. Chamberlain that the Government should consider this important subject between now and next session meet with any response. Sir M. Hicks-Beach did indeed agree that it would be desirable that facilities should be given for using the canals more than they have been used for some years past, but he did not think it would be wise for Parliament to give Local Authorities power to undertake works beyond their own jurisdiction, forgetting, as it appears, that they already have that power for several other purposes. But, leaving this out of the question, it may be asked why, in their own jurisdiction, a Local Authority may not make a waterway as well as a roadway?

**T**HE case of "The Edison and Swan Electric Light Company v. Holland and Others," on which Mr. Justice Kay gave judgment last Monday, after an exceedingly able and comprehensive summing up of the evidence, affords a practical lesson on the importance, in regard to patents and patent infringement actions, of knowing accurately what has been done by others, and of accurately and logically wording the definitions in the patent. The claim of the Edison Company was a double one; first, for an injunction against the manufacture of the now ordinary type of incandescent light with a carbon filament as the light-giving medium; secondly, against the use of the beautiful device known as "Chesebrough's Patent," for securing uniformity of sectional area in the carbon filament, by which the filament is actually made to automatically fill out its own deficiencies of thickness wherever such occur. In regard to this second claim, the learned Judge found for the plaintiffs, in spite of what appears a rather ingenious than ingenious line of argument used by the defendants, who claimed that they could make their filaments of uniform section without this process, and that they only used it to reduce all their filaments to a uniform light-giving standard. As they admitted, however, that if inequalities of section did exist in their filaments they would be removed by this process, the Judge decided that they were infringing the patent, and legally we presume that he was correct. The first claim of the plaintiffs, which was dismissed by the Judge, is the one which points the moral of the case. It is extraordinary that an inventor of so much genius and insight as Mr. Edison should have apparently been so ill-informed as to what others were doing as not to have been aware that the principle and many of the details of the incandescent lamp had been worked out by others before the date of his patent, and



still more surprising that he should have had so little logic as to suppose that the manufacture of an improved and thinner filament with higher resistance should give him a right of veto over all other manufacturers of filament lamps. As Mr. Justice Kay says, his claim in effect was this:—"I have succeeded in making an electric lamp with a carbon burner, say 100th of an inch in diameter, which gives a high resistance, and I claim a monopoly of all lamps with carbon burners, but thicker than that, however made." Technically the Judge decided that the defendants had, indeed, infringed the plaintiff's patent in this case also, but that the claim of the patent was so exorbitant that it could not in justice be maintained: a judgment which may prove a valuable precedent in regard to the unreasonable demands often made by patentees, to the prejudice of real progress.

THE London School Board will probably find that they have made a mistake in the resolution which they passed last week, by 17 votes against 12, to call on their former architect, Mr. Robson, to make good the loss arising from defective foundations in the Broad-street Schools. The case is, that in April last cracks appeared in the wall of the school, which had been built under Mr. Robson's direction; and on examination by a test hole, it was found that the concrete used was very bad, in fact, hardly worth calling concrete at all, and that there was much less of it in depth than had been specified and paid for. Whereupon the Board wrote to Mr. Robson calling on him to make good the loss arising from their payment on his certificate for work which had not really been done. Mr. Robson's reply, which is printed at length in the *School Board Chronicle* for July 14, points out that from the nature of his appointment and the enormous pressure of work devolving on him, personal inspection of all buildings in progress on his part was an absolute impossibility, and that the Board themselves had recognised the fact by appointing, in addition to the Clerk of Works, an Inspector of Works, with the distinct object of relieving him from the bulk of inspection. The clerk of works, also, is the servant of the building owner and not of the architect, though the Board urge, on the other hand, that they had always accepted the clerks of works nominated by Mr. Robson. Still, the Board's Inspector, appointed especially for the purpose of personal inspection which the architect had not time to give, ought to have discovered such a fault in the work that was being done. If the case had been that of an architect in ordinary practice on his own account, it might reasonably be said that he ought to have given personal inspection to so important a matter as foundations; every architect in ordinary practice ought to do that; but Mr. Robson was in a different position. He was head of a large official staff for carrying on and looking after work which it was impossible he could look after personally in every point, and he was necessarily dependent on the *bona fides* and professional skill of his subordinates. In signing a certificate for payment on a statement that so much work had been done, he was only doing what is usual and inevitable in many other departments of business. Managers of banks, managers of companies, Cabinet Ministers, are constantly called upon to put their signatures to documents for the correctness of which they are almost entirely dependent on the good faith of their subordinates. The claim made by the Board against Mr. Robson is in this light morally absurd, and we believe they will find it is legally untenable.

THE third International Congress for the promotion of internal navigation, to be held at Frankfurt-on-the-Main in August, will give full attention to the subject of connecting by water the Upper Rhine districts with the North Sea, and will also discuss the questions of internal navigation both from a practical and a theoretical point of view. The result of their deliberations will doubtless lead to considerable improvements in canal and river

navigation. The canalisation of the Main from Mayence to Frankfurt was accomplished at the suggestion of the commercial community of Frankfurt from 1883 to 1886, and has already greatly benefited the city. By means of locks and weirs the river can be raised between Frankfurt and Mayence to an average height of 6 ft. 0½ in., thus enabling vessels of 1,000 tons, heretofore plying only on the Rhine, to take the direct route to Frankfurt, and to dispense with the necessity of transshipping at the mouth of the Main goods destined for that city. In connexion with the canalisation of the Main, the municipal authorities have made such arrangements for shipping and traffic at the banks of the river as will ensure promptitude in all manipulations with reference to the loading and unloading of goods. A special safety and trading harbour was opened in 1886, and the trade of the Main has considerably extended since the opening of the canal.

THE July Quarterly Statement of the "Palestine Exploration Fund" commences with the sentence, "We have generally an announcement to make, but not often of so much importance as that of this day. It is the discovery of the Pool of Bethesda." This discovery, for such it certainly seems to be, is due to a German explorer, Herr C. Schick, who communicates a lengthy account of the process of the discovery, accompanied by a plan and two sections of the ground. The discovery arose in the course of a clearance of ground for a new building adjacent to the Church of St. Anne. The pool is, according to Herr Schick's plan and section, an oblong pool or cistern divided into five bays, and approached now by twenty-four steps, a number which nearly tallies with the number of twenty-three steps given in a fifteenth-century record. As Herr Schick says, the water may have been higher then, but the close coincidence in the number of steps looks as if we had found, at all events, the place accepted in Medieval times as the Pool of Bethesda. But the situation of the Pool generally appears to agree remarkably well with Biblical indications. We must refer the reader to the *Quarterly Statement* for information in detail, but any one interested in Palestine topography will find it well worth reading. We cannot, however, understand the editorial remark under "Notes and News." After mentioning the finding of the first pool, we read:—

"Herr Schick has found a second pool to this, forming what is called a twin pool. The interest of this discovery lies in the fact that the Pool of Bethesda had five porticos. Now the only possible way for a pool to have five porticos is to be a double or twin pool, so that there may be one portico along the wall of each side, and one for the wall of separation."

It would appear from this that the editor of the *Statement* has not looked at or does not understand the plans published in the same issue. The twin pool west of the "Bethesda" is not claimed by Herr Schick at all as part of the Bethesda, and the earlier pool, his "Bethesda," shows, according to his plan, five recesses in a row behind a colonnade, in which each column corresponds with a pier between the recesses at the back. Surely this is a sufficiently clear rendering of *stereotipic*. But Palestine archaeologists seem to have each their own theory, and to be blind to any other.

IN a book entitled "Esquisses Archéologiques," M. Salomon Reinach, publisher, publishes reprints of a number of interesting archaeological articles he has from time to time contributed to various French journals and periodicals. As many of these publications are by no means specially devoted to archaeology, e.g., the *République Française*, and the *Revue politique et littéraire*, the volume will be welcome to archaeologists. The subject of terra cotta, to which M. Reinach has devoted so much labour, occupies of course a considerable space in the book. But other departments of Greek art are well represented. No. 3 is an article on the excavations at Susa, which, now the great Dieulafoy gallery in the Louvre is open to the public, will be read with interest.

The reprint also of the monograph on "The Archaic Statues of the Acropolis" is well-timed. One essay, the last, on the "End of the Greek Empire," is published for the first time. The book contains a number of woodcuts in the text, and eight plates. It is nowise unworthy of the author of "L'Épigraphie Grecque."

AT a recent meeting of the Verein deutscher Cement-Fabrikanten, Dr. Leube, of Blaubeuren, gave a description of a bridge built of concrete, near Erbach, a station between Ulm and Friedrichshafen, from the designs of Herr Koch. An important feature in the construction of the bridge is the insertion of joints to provide against a collapse in the case of settlement. The arch has a width of 95 ft. in the clear, by a rise of 13 ft. The vault has a thickness of 1 ft. 7½ in. at the crown, 2 ft. 3½ in. at the commencement of the springing of the arch, and of 4 ft. 11 in. lower down. The concrete used for the arch consisted of one part Portland cement, one part sand, and three parts carefully washed and screened Danube gravel of walnut size, and was rammed down in layers of 2 ft. 7½ in. wide. Considering the treacherous nature of the river bottom, a giving way of the foundations was apprehended from the first, and in order to guard against the effect of this, which would be disastrous to a concrete arch, asphalt sheets were inserted at the two abutments and in the crown of the arch. In this way collapsible joints, permitting of twisting motion, were provided, and it is stated that such torsion did take place after the removal of the centering, the joint in the crown being narrowed to the extent of 0.312 in., but, as might be expected, without any damage to the concrete. Of course, a so-called "concrete arch" is constructively not an arch at all, but a beam in arched form, and the insertion of the asphalt joints in this case converted it into an arch with very long voussoirs; an unscientific form of arch, but which seems to have answered practically in the present instance. A better construction would have been to have employed a larger number of concrete blocks each with its asphalt joint; but, of course, at greater expense. As it is specially mentioned that the bridge only cost 600L, we may presume economy was the object of this experiment in bridge construction.

THE City Justices of Liverpool some time ago appointed a committee of their number, with Sir James Picton as Chairman, to inspect the theatres within the City, with reference to the provision for the safety of the public in case of fire or panic. The Committee have just presented their report, and it has been adopted by the magistrates, and printed. The report states that, after a thorough personal inspection of the theatres by the Committee, instructions were given to the City Surveyor and City Engineer to prepare plans of the buildings and to present separate reports and recommendations as to the alterations necessary for the public safety. These plans and reports were duly prepared, and after consideration by the Committee, were brought up at a Special Meeting of the Justices on the 21st of March last, when the Committee was re-appointed, with authority to carry out their recommendations, subject to such modifications as they might see fit to grant. The Committee have since held numerous meetings, have renewed their personal inspection of the buildings, and have held various conferences and consultations with the lessees and their architects, assisted by the City Surveyor. They report with pleasure that they found on the part of the lessees every desire to carry out faithfully the recommendations made. The leading features and objects of the alterations agreed to, and which are now being carried out, are thus summarised by them:—

"The most important of all is protection from fire. It is an established fact that in every recorded case of fire in theatres, the origin has been on or behind the stage, but in no instance has the fire broken out in the auditorium. If, therefore, a solid wall of sufficient thickness is built, entirely separating the two portions, the few necessary openings being fitted with iron doors, the only difficulty to be dealt with is the stage opening or proscenium. The combustible curtains hitherto adopted are



dangerous in the extreme, and have led to very serious loss of life by the panics and stampedes arising from fright. Curtains of non-inflammable materials have been adopted, as at Exeter, but have failed in consequence of their flexibility and want of substance.

The Committee have had before them various designs and plans, and have inspected some which have been carried out, particularly that of the Prince of Wales's Theatre in London, which seems to comprise everything that can be desired for the public safety.

The main requirements are (1) that the material shall be incombustible, consisting in great part of iron; (2) that it shall be rigid, not liable to be deflected or bent; (3) that the means of lowering or elevating it shall be ready, simple, and easily worked.

There are several modes of carrying out this principle according to the extent of the opening and other circumstances, but all consist of double plates of iron, in one case hollow, the others filled in with slates or cotton, which is incombustible.

Even in the present state of the theatres, if these recommendations are carried out, there could be no danger of panic, since the audience might withdraw without danger in the most leisurely manner; but, acting on the Report of the City Surveyor, a number of alterations have been suggested, of widening the exits, providing additional openings, improving the staircases, and in some cases constructing additional ones. These have been agreed to by the lessees, and are now in progress in the following theatres:—Alexandra, Court, Rotunda, Grand or Varieties, and Adelphi.

WE hear that the fee-simple of the old house, No. 20, North-street, Exeter, to the threatened fate of which we referred in the *Builder* of June 23 (page 444), has been offered for 260*l.* to the Institute of Architects, on condition of re-erecting the front somewhere else, as the removal of the house from its present site is necessary for the widening of the street. It is, of course, no part of the business of the Institute to purchase old houses, but possibly some archaeologist with a little money to spare may be tempted to interfere and save this one.

UNDER the somewhat suggestive heading of "The Public Building Jobs," the *New York World* lately quoted the following from the *San Francisco Chronicle*:—"There is nothing quite so puerile, so silly, so absolutely idiotic in the whole system of Federal government and legislation as the way Congress goes about public buildings, or, indeed, any public improvement." It would seem, from this, that Offices of Works are very much alike all the world over.

CRAIG-Y-NÔS CASTLE, familiar by repute to many as the Welsh home of Madame Patti-Nicolini, is in the market. Built in the Tudor style, it is situated in Swansea Valley, about midway between Swansea and Brecknock. The pleasure-grounds, of 38 acres, descend by terraces and slopes to the River Tawe, which affords some good trout fishing. The whole property extends over 353½ acres. The Staffordshire estate of Laphley Hall was marked for sale by auction, at the Queen's Hotel, Birmingham, on Thursday last. Including the farm and some accommodation holdings, this property, intersected by the Birmingham and Liverpool Junction Canal, consists of 700 acres, yielding an income estimated at 1,000*l.* a year. The Hall, seven miles distant from Stafford, stands on the site of a Priory of monks Dominican, which is said to have been assigned (*temp.* Edward the Confessor) to Rheims Abbey, by Earl Ælfgar of Mercia. Subsequently appropriated by King Henry V. as an alien possession, it was given to the neighbouring collegiate church of St. Bartholomew at Tong, co. Salop, whereof the site and estates were granted, in 1 Edward VI., to Sir Richard Manors.

AN Architect (A.R.I.B.A.), who desires us not to mention names or places, encloses us a correspondence with a contractor who had been doing some work under him, and who, on the conclusion of the work, sent him a cheque, which was promptly returned, with the remark that the best way he could remunerate the architect would be to do his work thoroughly well, so that the client should have no reason to complain. The contractor's reply is characteristic:—

"Dear Sir,—I thank you for your letter of the

—inst., and fully appreciate the spirit in which you return my little favour. Of course you know, and it is scarcely necessary for me to say, *such little recognitions are customary in the profession*, but I am perfectly satisfied you returned the cheque in the same good spirit in which it was tendered to you. I leave you to say whether the work was done in a workmanlike manner, and am myself perfectly satisfied if I have given satisfaction to all concerned.

Hoping at some future time to be favoured with your recommendations,—I am, &c., &c."

The hope ingenuously expressed at the close of the letter was, of course, the motive in sending the cheque at first; but the most interesting portion of the letter is the line we have italicised. How does it come about that any contractor can presume to say, as an excuse for such an improper proceeding as endeavouring to buy the future favour of an architect, that "such little recognitions are customary in the profession"? That it is an absolute falsehood about a large proportion of the profession we know well enough, but of how many is it true, if true at all? We cannot help suggesting that the Institute of Architects might itself with advantage have a Commission of Inquiry, if it could obtain powers to examine witnesses on oath. We might then have a chance of either proving such statements to be calumnies, or getting at the men who give cause for them.

#### ARCHITECTURAL ASSOCIATION VISITS: LAYER MARNEY AND NEIGHBOURHOOD.

AN interesting day's excursion was made on Saturday last by the members of the Architectural Association to a little-known district of Essex, principally with the intention of seeing that fine example of English domestic architecture, Layer Marney Towers (illustrated and described in the *Builder*, April 3 and 10, 1886). Leaving the train at Kelvedon station, the party first visited the church at that place, under the guidance of the vicar, the Rev. G. P. Bennett. The church consists of a nave and chancel, with north and south aisles to each, and square western tower and shingle spire. The nave, the oldest portion of the church, is of Lat. Transitional date, the pier caps being an interesting example of the development of Early English carving. The roof is an open timber one of fourteenth-century date, with carved figures at the feet of the principals. The chancel and aisles are of Decorated character, and the north chancel aisle is of sixteenth-century work, replacing probably an earlier structure of the Decorated period, a niche from which and a two-light traceried window, shorn of its tracery and centro mullion, and utilised as a doorway, are incorporated in the later work. The arches and piers of this north chancel aisle are similar in detail to those separating the nave and aisle at Layer Marney Church. The chancel has the peculiarity of plan so frequently found in Medieval churches, its axial line inclining northward from that of the nave. Amongst the monuments in the church are some good examples in marble of the English Renaissance, erected in memory of members of the Abdy family, Sir Thomas, who died 1679, Sir Anthony, 1704, and Thomas, son of Sir Anthony, 1684. Other features of interest in the church are the two hagioscopes through the piers north and south of the chancel arch, an ancient piscina in the south aisle wall, and a modern restoration of another in the south chancel wall. On the south nave arcade has been placed at some time a well-carved sixteenth-century shield, bearing the arms of England and France quarterly, with the label of the heir apparent. After viewing the church, the party were invited by Mr. Bennett into the vicarage, where they were shown a fine collection of old china, cabinets, and books, Dutch tiles, and a curious cast-iron panel representing the Last Supper, apparently of late sixteenth-century date, and based on the well-known picture of Leonardo da Vinci. Passing through the village (formerly known as Easterford) the fine old half-timber building of Kelvedon Old Hall, now an inn, with its well-carved beams, barge-boards, and open porch, was inspected. There is a good panelled ceiling in this house, but the visitors were not able to see it, owing to the recent death of one of the inmates.

The members then walked to Feering Church, where they were met by the vicar, the Rev. W. J. Packe, who explained the interior of the

church, the chief features of interest being the pulpit, a modern piece of work with four carved panels of late sixteenth-century Italian workmanship, representing scenes from the Passion incorporated with it; the colour decoration, reproduced from the Medieval work; and the modern choir-stalls, the carving of which has been excellently executed by the village carpenter. In the vestry are a Jacobean chest, table, and settle. The great charm of the church is the south aisle and porch, executed in red brick, with black headers in diaper, trefoiled arched cornice, and flint panels. An illustration of this work, by Mr. Arnold B. Mitchell, is given by us this week, but the charming colour produced by time and lichen must be seen to be appreciated. The date of the work is approximately fixed by the close correspondence of the detail with that of Layer Marney Towers and church, the arch moulds and plinth being precisely similar in section, leading us to believe that the same moulds must have been used for the brickwork in each instance. The mullions of the windows have been renewed in modern times, but the remainder of the work is original. The brick-ribbed vaulting of the porch is particularly good, and the whole work is an excellent example of English brickwork at the beginning of the sixteenth century.

Leaving Feering, the party proceeded to Messing, where lunch was provided at the Old Crown Inn, after which the church was visited. This church has recently been restored by Mr. Fred. Chancellor, and consequently looks very new, but the painted glass of the east window by Van Linge, and the well-carved Jacobean panelling in the chancel, are interesting. A three-mile walk from Messing brought the visitors to Layer Marney, where the rector, Mr. Boys, first showed them the church, with its monument of Lord Henry Marney, the builder of the Towers, that of Lord John Marney with its altar still remaining, and an earlier fifteenth-century tomb, probably that of Sir William Marney, whose will, dated 1414, directs the erection of such a tomb. The tomb of Lord Henry, of buff terra-cotta, with its arch canopy and early Renaissance detail, and the fine effigy of the baron, is naturally the greatest attraction, though that of Lord John is but little inferior. (Illustrations of the tomb, and of the leopards forming part of the "grate of waynscott" around the tomb of Lord John, are given in this number of the *Builder*; and a sketch of the church is also given, see next page). The church possesses a Perpendicular wagon-headed ceiling with modern decoration, a modern pulpit with portions of carving of Perpendicular and Jacobean date worked in, and a fairly preserved fresco of St. Christopher. The Towers were then visited, and the members entertained by the present occupiers, Mr. Charles Maclean and Mrs. Maclean. A full description of the mansion and its outbuildings is given in the *Builder* of April 3 and 10, 1886, already referred to. The terra-cotta work of Layer Marney should be compared with that of the sedilia in Wymondham Church, Norfolk.

#### THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.—ANNUAL MEETING.

THE fifteenth annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors was held in London last week, and extended over three days. The annual business meeting was held in the hall of the Institution of Civil Engineers, Great George-street, on Thursday, the 12th inst.

##### The Annual Report.

The Secretary (Mr. Thomas Cole, A.I.C.E.) read the annual report, of which the following is a summary:—

The Council, in the first place, expressed their gratification at the progress which had been made by the Association during the last twelve months. During the year more new members had joined than in any previous year, the papers read had been very valuable, and the meetings generally had been numerous and instructive. During the year, District Meetings had been held at Newcastle-on-Tyne, West Bromwich, Luton, Maidstone, Lincoln, Leamington, York, and Carlisle. In all cases, the Association had been most kindly welcomed by the municipal authorities. During the financial year ending April 30th, 62 new members, consisting of 52 ordinary Members and 10 Graduates, had joined the Association. One member had resigned, and there had been one death. The numbers on the roll of the Association at the close of the period





Laver Marney Church, Essex.

mentioned were 14 Honorary Members, 320 Members, and 15 Graduates, making 349 in all. The audited Balance-sheet, which accompanied the Report, exhibited a balance in hand on April 30th of 369*l*. 1*s*. 7*d*., which, taken with the statement of assets and liabilities, showed a satisfactory financial position. The ballot-lists having been duly issued, the scrutineers had reported the following gentlemen duly elected as the Council for the ensuing year.

*President*.—Mr. E. B. Ellice-Clark, M. Inst. C.E. *Vice-President*.—H. P. Boulnois (Portsmouth), A. M. Fowler (Stockport), and A. W. Parry (Reading).

*Ordinary Members of Council*.—A. Brown (Nottingham), J. Cartwright (Bury), J. H. Cox (Bradford), C. Dunscombe (Liverpool), J. T. Eayrs (West Bromwich), E. R. S. Escott (Hull), T. Howson (Leeds), J. E. McCallum (Blackburn), H. U. McKie (Carlisle), T. de Courcy Meade (Horseley), R. Read (Gloucester), and T. Walker (Croydon).

*Honorary Treasurer*.—Mr. Lewis Angell (West Ham).

*Honorary Secretary*.—Mr. C. Jones (Ealing).

Two examinations had been held during the year, the first of which took place on the 7th and 8th of October, at the Town Hall, Manchester; and the second on the 27th and 28th of April, at the Institution of Civil Engineers, Westminster. At the first of these examinations, nine candidates presented themselves, and six passed.\* At the second examination, twenty-three candidates came forward, and fourteen satisfied the examiners.† In view of the comparative numbers of candidates appearing in London and the provinces, the Council has decided to hold the examinations in London in future.

The Council could not allow their Report to go forth without calling attention to the fact, that one of whom they had been in the habit of looking as their leader in the sanitary world, and who had for so many years occupied the position of Chief Engineer to the Local Government Board, had retired from that honourable position, followed by the best wishes and kindly esteem of all who knew him. In tendering to Sir Robert Rawlinson their best thanks for the services he had rendered to municipal and sanitary engineering, the Council could not but express their hope that he might long be spared to meet them and still aid them by his counsel and support.

The Council had had under consideration the duties of surveyors in carrying out the terms of their appointments in connexion with the Acts of Parliament in that behalf, and had memorialised the Local Government Board thereon.

During the present session of Parliament a Bill was introduced having for its objects the compulsory registration of Engineers, Surveyors, and Architects. The Bill was fully considered by the Parliamentary Committee of the Association, who came to the conclusion that its provisions were crude and unworkable, and that the Bill would have perpetuated the very evils it sought to remedy. The Council, therefore, petitioned against the Bill, which course was also adopted by other societies representing the professions concerned, and the Bill was withdrawn on the second reading.

The provisions of the Local Government Bill, now before the House, were being carefully watched by the Parliamentary Committee.

Since the last general meeting, the Council had to report, with regret, the loss by death of two members, Mr. S. F. Rowley, of Tipton, and Mr. T. Coulthurst, of Derby; the last-named was for several years a member of the Council.

The Report was unanimously adopted.

#### The President's Address.

Mr. E. B. Ellice-Clark, M. Inst. C.E., President, then delivered his address, as follows:—

Gentlemen,—I have much pleasure in welcoming you to Westminster, and in congratulating the Association on its increased prosperity and usefulness. As you have heard in the annual report, there has been a greater increase in the number of members during the past year than in any year since the formation of the Association. In this connexion it is to be remarked that there has been a considerable addition to the Association through the metropolitan Surveyors, who, under the original rules, were debarred from membership. It had long been obvious to your executive that any association professing to represent the Municipal Engineering profession of this country was incomplete without including the surveyors of the greatest city of the world. There is no doubt in my mind that the Association will not only be greatly strengthened in numbers, but that the reports of its proceedings will be much enhanced, from a professional point of view, by the accession of the metropolitan Surveyors.

The sphere of usefulness of the Association is being considerably extended, not only in the papers that are contributed, and which are sought for by municipal and sanitary engineers throughout the world, but also by the work which the Council have undertaken in the examination of candidates as to their qualifications

to fill the office of Municipal Engineer and Town Surveyor. The rise and progress of the municipal and sanitary engineer will some day form a very interesting history in the archives of municipal authorities; his growth from the "mere mender of roads" and the "patcher of highways" to a skilled, thoughtful, and scientific engineer, has occupied a period of about fifty years only; modern requirements are such that not only in every town in the country, but in almost every village, it is necessary to have recourse to the services of a thoroughly qualified and capable engineer and surveyor. It is a mistaken notion on the part of local authorities that, because the population whose public affairs they administer happens to be small, the works which are required to be carried out in such districts are of a simple character. It not unfrequently happens that the engineering works necessary in small towns require greater engineering skill than they do in some of the great towns of the country, for the physical conditions of such small towns determine to a great extent the nature and cost of the sanitary works required; therefore it is of the highest importance for the conservation of the public health in those communities that all public works should be designed and executed in as careful and complete a manner as possible. This can only be attained by appointing to the office of Surveyor a man who has received a good technical education, and such appointment should be the stepping-stone to those of the larger towns. None of the work, therefore, which has been undertaken by this Association is of greater utility to the community than the examination of young engineers. Nor can the Council more fully carry out the objects of the founders than by ascertaining that all candidates for the office are possessed of the necessary professional knowledge; and when the municipalities of the country are made acquainted with the practical nature of the examinations, they should gladly avail themselves of the services thus rendered, as it will save consulting committees a large amount of labour; and, if I may be permitted to say so, the work of ascertaining the professional qualifications of candidates is better done by a body of examiners formed of municipal engineers than by the lay committee of a Town Council. These examinations are already beginning to

\* For their names, see *Builder*, Oct. 29, 1887, p. 620.

† See *Builder*, May 19, 1888, p. 388.



bear good fruit, for there are not wanting instances in which the selection of a candidate for a municipal office has been determined by the holding of one of this Association's certificates. But great as is this step in advance, and largely as this work assists "the general promotion of the objects of sanitary science," if we are to carry out to their consummation the intentions of the founders of this Association we must go still a step further. It is a matter of primary importance, not only to the advancement of sanitary science, but to the community at large, what manner of men in succeeding generations shall fill your offices. We must not be satisfied with merely examining such candidates as promiscuously present themselves to us, but we must assist in obtaining the proper candidates; we should, as far as is practicable, lay down some guiding rules for their education.

It has long been evident that the present system, or rather want of system, in the training of municipal engineers in this country is exceedingly defective. On the Continent it is usual for all engineers to receive a professional education at a technical school. In England, as you are aware, the system of pupilage obtains. It is doubtful whether the Continental system is a successful one; on the other hand, the hap-hazard way in which young engineers are trained in this country leaves no doubt that there is great room for improvement; probably a combination of the two systems would bring about better results than either the existing Continental or English practice. A youth who is intended to follow the profession of a municipal engineer should receive a sound general education at some public school, and without making invidious distinctions, I would point out the Bedford Modern School as the type of academy in which he should be educated. Special attention should be paid to the acquirement of a knowledge of physics, higher mathematics, free-hand drawing, and chemistry; and he should, if possible, master at least two modern foreign languages, preferably French and German. At about the age of seventeen he should be sent to a School of Municipal Engineering, if such could be found, and it may be here pointed out that there is no practical difficulty in the way of establishing such a school. There might, at the Crystal Palace School of Engineering, Owens College, Manchester, Mason's College, Birmingham, and other similar Colleges, be special courses instituted for the technical education of municipal engineers. Here should be taught the elements of surveying, the use of instruments, practical mechanics and mechanical drawing, and the strength of materials; other subjects will occur to you, but these appear to me to be the leading subjects in which the knowledge of pupils entering engineers' offices is most defective. A year, or three terms, passed at such a technical school would be invaluable, so that when a pupil entered a municipal engineering office, instead of being of no service for from six to twelve months, he should be useful at once. The period of pupilage should be at least four years; three years is altogether inadequate in which to acquire a sufficient knowledge of the profession to enable him to become a competent assistant on completing his articles. As the practice of our profession varies very considerably in different localities, the exchange of pupils by municipal engineers would be most advantageous; say, for instance, if a pupil articulated to the Borough Engineer of Leeds could be transferred for the last year of his articles to London, and *vice versa*, his experience would be greatly enhanced, and probably the employers would also be benefited by such an exchange of pupils. Each engineer will know best how to treat each pupil. It is usual for him now to commence in the drawing-office, and in a couple of years to go out on to works. It is doubtful if this is the best plan; a knowledge of practical work goes a great way to make a good draughtsman, for the simple reason that if a man knows what he is drawing he is much more likely to become an accomplished draughtsman than by copying drawings which to him are mere lines and colours. Perhaps the first year of pupilage should be spent out upon works. During this year the not unimportant portion of his future occupation, viz., the ordinary maintenance of roads, sewers, and buildings, should not be neglected, for it is not an uncommon thing for a young surveyor, who has never previously superintended the paving of a street or had any ex-

perience in the handling of workmen, to receive an independent appointment. The third year, after spending one year in the office, should be devoted to engineering works of as diverse a character as the district will afford. In the last year the pupil should be engaged on both office work and out-of-doors, assisting in the preparation of schemes and seeing them executed. At about the age of twenty-two, such a young man would, with ordinary ability, be worth taking into an office at a salary, and he should be well able to pass the examination of this Association. A considerable number of candidates have presented themselves for examination, and their numbers appear to be on the increase.

It will be asked if, after all the preparation described, and a young man becomes a competent municipal engineer, is there a good prospect open to him? It is a common cry with the young men of the age, that all the professions are overcrowded. All walks in life are overcrowded with incompetent men. No profession, especially our own, is overcrowded with thoroughly competent and trustworthy men. Of the amount of work that yet remains to be done by the municipal engineer, it may be stated that during the past few years I have had, as consulting engineer, through my hands, reports on upwards of 1,000 houses in the metropolitan area, the rateable value of such houses averaging considerably more than £100 per annum. Of these, 50 per cent. were in such a bad condition as to require entirely new sanitary arrangements. Now, the number of houses in the metropolitan area may be roughly taken at 750,000. If the above figures offer a true indication of the present condition of these houses, there remain something like 375,000 in London alone in which new drainage works are absolutely necessary; and, looking at the high rateable value of the houses of which mention is made, it is probable that more than this number require to have their sanitary appliances renewed. This condition of things probably obtains in a greater degree in the provincial towns.

This is only one part of the work which the future municipal engineer will have to accomplish. There is much to be done in the arterial drainage of towns, and also in the prevention of floods in the great river valleys of this country, and in discovering, inventing, or designing an economical pavement, which must be impervious, insonorous, durable, and non-slippery. The municipal engineer has given to the larger populations during the past forty years good water supplies, better drainage, and better-paved streets, and has also instituted some systems for the removal of decaying matters accumulating round dwellings more or less successful, but there still remains other work for him to execute. Before the sanitary condition of our towns is anything like perfect, we must do something more than prevent air pollution from decaying matters. The salubrity of a town, though depending very much upon the foregoing, is still incomplete while air pollution by smoke takes place as it does at present. You have lately been discussing the question of the merits of the so-called "Destructors." No doubt the economical and speedy removal of house refuse requires a practical solution, and it may be that the so-called "Destructor" is, for the moment, the most ready and practical means available for accomplishing this object; but it certainly is, as its name indicates, a barbarous and unscientific system.

Owing to the cheapness and availability of fuel in this country, we pursue a method of obtaining heat in dwelling-houses which is only one step removed from the consumption of fuel on an open hearth in the tent of the savage, and the same unscientific method of obtaining heat prevails (only in a lesser degree) in nearly all the factories of this country. By the imperfect and partial combustion of fuel in an open fireplace, we not only do not obtain one half of the effective value of the fuel, but we pollute the atmosphere to such a degree as to make the air of most of our cities, through a considerable portion of the year, almost insupportable. Let us conceive for one moment what a beautiful city London would be, even in winter, without the well-known London fogs, which are largely due to the presence of unconsumed carbon, caused by smoke from domestic fireplaces. Take again the Lancashire towns, from Manchester to Preston, through Darwen and Blackburn. These towns are physically

situated in a series of the most beautiful valleys in England, and if they were freed from smoke, their natural position would certainly render them desirable places of residence, which cannot be said under their present condition.

The future municipal engineer must, therefore, among other things, pay attention to the prevention of air pollution by smoke. Many attempts, as you well know, have been made during the last half-century to accomplish this object, and a few years ago an exhibition was held in London for the purpose of demonstrating that such pollution can be prevented. No doubt considerable advances have been made in this direction, but in my judgment any attempt to overcome the difficulty by burning fuel in an open stove will end in failure. We are nearer a solution of this subject than is generally supposed. The manufacture and distribution of non-luminous gaseous fuel for heating purposes from a central station is not very far distant; by this means you will not only prevent air pollution by smoke, but you will be able in a very large degree to overcome the difficulty of removing decaying matter not passed into the sewers. If such a system were at work in town there would of course be few or no cinders or ashes to be removed from houses, and there should be no difficulty in designing such a stove, fed by gaseous fuel, as would, in every house, consume the decaying matters which, now form so large a bulk of "house refuse."

There is another subject to which I am desirous of drawing your attention, and that is, to the great waste of money and time which takes place in the present method of arriving at conclusions in respect to many of the problems which a municipal engineer has to solve. Now, while I deprecate to a great extent the interference of the State in commerce and manufactures, as well as in many municipal affairs, it appears to me that great benefit would accrue if assistance were given by the State, or, if, by a combination of the Municipal Authorities of this country, there could be established some kind of Institute or permanent Commission for original scientific research. What enormous sums of money would have been saved had the disposal of sewage been taken in hand by such a Commission or been worked out by practical and scientific men, keeping accurate records and making original observations at some sewage-works, as well as in the laboratory, making public reports of their observations and experiments from time to time! If there had existed such a body as this in those days when Mr. Wicksteed was laying the first sewers at Leicester, and Mr. Pildrow was doing like work at Tottenham, now thirty-six years ago, the solution of the problem would have been greatly expedited. A large mass of information on this subject exists, buried in Blue Books and Reports to Sanitary Authorities, and therefore not available for practical purposes. It is well worth the consideration of any Government of a State like ours, where large masses of population are aggregated together, and with this aggregation still going on at an almost alarming rate, whether some of the more difficult problems which are now attempted to be solved by individual municipalities and engineers should not be grappled with by a State College or a Commission such as I have named.

It is now more than a year since a Committee was appointed by your Council to collect information and report upon the question of the ventilation of sewers. The mass of evidence which has poured in upon them is such as will require an amount of work which it is well-nigh impossible for that Committee to undertake; and I shall be disclosing no secret by saying that the publication of that report may be delayed a considerable time, probably years, because of the inability of the members of the Committee to give that time and attention to the work which are necessary. If there were in existence a Commission of Experts something on the same lines as the "German Commission of Experts for the Consideration of Patents," the evidence collected could be placed in their hands, work would be expedited, and a valuable report prepared in a few months which will now probably take years to accomplish. In the same way, a great number of subjects might be dealt with, and it is for you and your immediate successors to ponder well on the establishment of such a Commission as I have described.

Coming to topics which may more particularly



interest members of this Association, the past year has been a most important one in two respects. This year has seen the proposal for a large measure of local government which may have considerable influence on the future of the municipal engineer and local surveyor. Without trespassing on the domain of politics, I may confess my disappointment at the scope of the Local Government Bill. With the question of taxation and representation going hand in hand we have nothing to do, but it was greatly hoped that we should see in the Local Government Bill such a readjustment of the sanitary areas of this country as the exigencies of the case demand. It is well known that the administration of the sanitary laws is much more effective and much more economical in larger areas than it is in the small ones; the reasons are very obvious. As a rule, local government in the smaller areas is left in the hands of those who do not best serve the public interests, while the administration in the larger cities is very much more complete in every respect; therefore no Bill for the local government of the country can be considered anything like perfect without a readjustment of the areas. I understand it is very unlikely that the Report of the Boundary Commissioners will have any effect. It appears that so many interests have been touched, so many boundaries had, in justice, to be readjusted, that opposition has been excited from all quarters; but, however that may be, we cannot shut our eyes to the fact that sanitary work and sanitary administration suffer very largely from the present distribution of the areas; and no measure on this subject will, in my judgment, be complete until all the local authorities having administration over towns of less than 10,000 inhabitants are merged into larger communities; but I am afraid this is not likely to take place in our generation, and it is very difficult to make any practical suggestion that will better the state of affairs.

Another subject which greatly interests municipal engineers is the case of *Whitley v. Barley*. It is not necessary to enter into all the details of this case; it is sufficient to say that a surveyor, acting under the distinct resolutions and by the authority of a Corporation, has been mulcted in heavy penalties under the 183rd section of the Public Health Act, which was never meant to cover such cases as this. It appears now from the decision of Mr. Justice May (new which has been upheld under appeal), that no engineer or surveyor of a Local Authority may receive any other emolument but that of his salary. It seems to me that this was never intended by the Legislature at the time the Public Health Act was passed, and that it is directly in opposition to the interests of the ratepayers at large. The engineer or surveyor is appointed by a Sanitary Authority, at such a salary as is adequate for the ordinary work of a town; but there occurs, from time to time, a necessity for engineering works which demand a skill and a knowledge that should be paid for, and that is paid for in other branches of our profession on a much more remunerative scale than the salaries of local surveyors; and it is positive economy on the part of the authorities to pay their local engineers and surveyors a moderate salary for ordinary work, and extra remuneration for such additional work as crops up from time to time. It was the custom within a few years to employ an independent engineer to carry out most of such works; but the standard of knowledge and skill of the municipal engineer has so largely increased during the last quarter of a century that the custom of employing independent engineers is now falling into desuetude; and, I think, the change on the whole is a good one, and advantageous to the community, for however good he may be, no independent engineer can have such a complete knowledge of the requirements of communities as those officials who spend the whole of their time amongst them; and, therefore, even if the local official were paid for such extra work the full percentage that would be paid to an independent engineer, it would, in my opinion, be both economical and advantageous to the community that he serves. Whenever any alterations are made to the Public Health Act this is a matter that must not be lost sight of.\*

A vote of thanks having been accorded to the

President for his address, the following papers (to which we will return) were read and discussed, viz., on "Back streets, Lanes, and Alleys," by Mr. H. U. McKie, City Surveyor, Carlisle; and on "The Average Meter System," by Mr. G. R. Strachan, Surveyor to the Vestry of Chelsea.

Subsequently, the new drainage works on the "Shone System" at the Houses of Parliament\* were inspected.

In the evening the annual dinner of the Association was held in the Victoria Hall of the Criterion Restaurant, the President in the chair, supported by Sir Robert Rawlinson, Sir Joseph Fayer, Dr. B. W. Richardson, F.R.S., Major Tulloch (Engineering Inspector, Local Government Board), the Mayor of Leamington, the Master of the Plumbers' Company, and a large number of members and friends of the Association.

On Friday, the 13th inst., the second day of the meeting, after breakfast at the Hôtel Métropole, an interesting visit was paid to Messrs. Jennings' sanitary works at Stangate, Lambeth. Subsequently, a meeting was held in the hall of the Institution of Civil Engineers, when a paper by Lieut.-Colonel Jones, V.C., entitled "Ten Years' experience of the Shone System" was read and very critically discussed. To this and to other proceedings of the day we will return. Papers were also read by Mr. T. de Courcy Meade, Surveyor to the Hornsey Local Board, on "Electric Fire Alarms," and by Mr. W. Webster, F.C.S., on "The Purification of Sewage by Electricity." The last-named paper, which is one of some interest and importance, will be found on another page. After partaking of luncheon at the Hôtel Windsor, Victoria-street, visits were paid to the Lucigen Light Works and Brin's Oxygen Works, Westminster, and to the New Battersea Bridge Works, all of which more hereafter.

The concluding day of the meeting was devoted to a trip down the river in the steamer *Cupid*, kindly provided by the President. The members landed at Greenwich to inspect the works of the new Greenwich Ferry, which were described by Mr. J. Standfield, M.Inst.C.E. We will say something about this Ferry (which is fast approaching completion) on a future occasion. Embarking once more, the members proceeded to the contractors' jetty at Barking Creek, to inspect the new precipitation tanks and sludge stores now nearing completion at the Northern Outfall sewage works, from the designs of Sir Joseph Bazalgette, in whose absence the visitors were conducted over the works by Mr. Marshall, the assistant engineer. Messrs. John Mowlem & Co. are the contractors, and the excellent character of their work called forth general expressions of admiration from the critics and experts assembled, though the question whether the new works were likely to answer the anticipations of their engineer was one as to which there was much dubiety. Before the visitors left their seats at the luncheon-tables, and prior to the inspection of the works, Mr. Thomas Cole, the Secretary, read a description of the general scheme, furnished by Sir Joseph Bazalgette. This is in type, but is necessarily held over until next week. Returning to London, the members parted company for return to their several destinations, mutually congratulating each other on the great success of the three days' meeting, which has been more numerous attended, especially on the last two days, than any previous annual meeting. We hope next week to devote further space to a record of its proceedings.

**Present of Free Library Buildings to Camberwell.**—Mr. George Livesey, C.E., the Chairman of the South Metropolitan Gas Company, has offered to erect and present to the Camberwell Vestry free library buildings in the Old Kent-road, the offer being conditional upon the Vestry maintaining the efficiency of the building when completed. The offer has been readily accepted, and the Vestry have decided upon making an appeal to the public for subscriptions in order to provide three additional libraries in different parts of the parish, steps to be taken in the meantime to put the Libraries Act into force in the district. The Library rate is not to exceed one half-penny in the pound.

## THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION.

### FURTHER EVIDENCE.

WE resume our summary of some of the more salient parts of the evidence given before the Royal Commission of Inquiry into the working of the Metropolitan Board of Works.

At the sitting held on the 3rd inst., Mr. Charles Dunch, architect, recalled, said he had acted for claimants against the Board on many occasions, but had never on behalf of such claimants or in any other way had any pecuniary transactions with Goddard (senior). His fees were always paid direct to him by the Board, and he allowed no part of his fees to any one. So far as regarded the site of and the pulling down of the old Pavilion and the erection of the new one, he had nothing whatever to do with it, directly or indirectly. One or two members of the Board (Mr. Cook, for instance) were his clients, but for business not in any way connected, directly or indirectly, with the Board or with Board sites.

Mr. Felix William Spiers said he was chairman of Spiers & Pond, Limited. With his late partner, Mr. Pond, he was formerly the proprietor of the Criterion Theatre, which was first opened, he thought, in the year 1873. In May, 1877, a Select Committee of the House of Commons sat and examined witnesses respecting the construction and safety (in case of fire or panic) of the metropolitan theatres. Before that committee, the Deputy Chamberlain, Sir Spencer Ponsonby Fane, testified that with reference to safety and ventilation, the Criterion was one of the best theatres in London. In September, 1882, on receiving notice to take up the renewal of the license, the Lord Chamberlain informed them that the license would be a provisional one pending the report of the Metropolitan Board of Works, and would expire on Dec. 30. A report had then been made by Captain Shaw to the Board of Works on the condition of all the theatres of the metropolis. In October, 1882, witness's architect wrote by his direction to say that he was prepared to carry out all the recommendations of Captain Shaw. Ultimately, finding that the Board had stated that the construction and position of the building was such that no structural alterations could be suggested which would effectually provide for safety in the event of an outbreak of fire, and that, therefore, it was unfit to be used as a theatre, witness put the matter into the hands of Messrs. Haines, and agreed to pay them 1,000 guineas if they succeeded in obtaining the license, and 500l. if they did not. On the 23rd of February, 1883, he paid 250 guineas for extra expenses and outlay. Mr. Haines had a free hand to spend whatever money he liked, and no doubt he paid the hundred guineas each to Mr. Saunders and Mr. Fowler, and the 50l. to Goddard, and informed him (witness) at the time. Examined by Mr. Winch, Q.C., on behalf of the Inquiry Committee, witness said there were certain members of the Board with whom his company had done business, but only to a slight extent. Mr. Saunders was appointed by witness's company as joint architect with Mr. Verity in respect of the "Cock" Tavern,† and the joint architects received a cheque for 1,300l. Asked whether Mr. Saunders's appointment as joint architect was not for the purpose of rewarding him for his services in connexion with the Criterion Theatre, witness said "You may put it in that way."

Mr. Joshua Ellis, Secretary to Spiers & Pond, deposed that in June, 1883, he gave 10l. to Mr. Haines, who handed it to Mr. Lancaster, a clerk in the Board's office. That sum was given, he thought, after the plans had been passed, and was merely a recompense for the politeness with which Mr. Lancaster behaved to Mr. Haines.

Mr. Charles Bowyer said he was the owner of a property situate at Goldhawk-road, Hammer-smith. In 1880, Mr. Schneider, an architect employed by him, made an application to the Board for permission to erect one-story buildings (shops) on a portion of the forecourt of four houses there. The application was refused. The footpath that would have been left had these shops been erected had an average width of 13 ft. 6 in. Witness felt that the refusal of his application was most unfair, as permission to build out had been given to owners in

\* For an article commenting on the case of *Whitley v. Barley*, see the *Builder* for Dec. 10th, 1887, p. 795. For report of the case on appeal, see *Builder*, June 9 last, p. 417.

\* Fully described in the *Builder* at the time of their completion. See No. for Jan. 29, 1887, pp. 178, 179; and No. for May 14, 1887, p. 733.

\* See *Builder*, current vol., p. 8, ante; and last vol., pp. 134, 146, 160.

† See summary of Mr. Verity's evidence, *Builder*, p. 8, ante.



Uxbridge-road and in The Grove, Hammersmith. He also complained of the long delays that occurred in getting answers from the Board.

Mr. Ernest Schneider, an architect, said that he remembered making an application to the Board on behalf of Mr. Roberts to build forward on some land he owned in The Grove, Hammersmith. (He was Mr. Roberts's assistant at that time.) The application was refused, and Mr. Roberts afterwards granted a lease of the plots of land in question to Mr. Bartley, a coal merchant. Mr. Bartley was ultimately allowed to build forward. He believed that Mr. Millwood, one of the Board's servants, was employed by Mr. Bartley as architect and surveyor.

Mr. Alfred Millwood, recalled, said he was in the Architect's Department of the Board. He had acted for a few persons who were erecting or were about to erect buildings, by making plans for them, in his own time. He believed that in some instances those plans were submitted to the Board. He made a plan for Mr. Bartley for building out in The Grove, Hammersmith. Knew that the Board had previously refused to allow the buildings to be brought out, but the plan he prepared for Mr. Bartley was for one-story shops only. Witness believed he was in the Building Act Department of the Architect's Office at that time, but he had nothing to do with determining questions as to the allowance or disallowance of plans. Practically that rested with Mr. Hebb, or with a temporary assistant (Mr. Collard) employed at that time. Witness did not speak to any one in the office as to the plan he prepared for Mr. Bartley; Mr. Hebb dealt with it; he, witness, had not the slightest influence in the matter. Mr. Bartley was an old friend of witness's, and he came to witness's house and asked him to make the plan.

Mr. Bowyer, recalled, pointed out that in the application which was allowed for building out in The Grove, Hammersmith, the footpath was much narrower than the footpath would have been if his application in re Goldhawk-road had been granted. If he had employed Mr. Millwood to make his plan, he thought he should have succeeded in his application.

Mr. William Brady said he was in the employment of the Metropolitan Board of Works, and had been in the Improvements, Compensation, and Estates Department since 1878. Mr. Goddard (sen.) was his immediate chief. He prepared details for valuations, which were submitted to Goddard, who settled the amount which the Board was to give for any property. In two instances witness had received money in connexion with properties that had been purchased by the Board. He (witness) and his friend, Mr. Frank Hards, of Greenwich (who was his fellow-clerk for ten years before witness entered the Board's service), had had "various little speculations" together for a long series of years, and they were jointly interested in some property (at Europa-place, Battersea) which had been scheduled by the Board. Originally, a letter was sent by the owner of the property offering to negotiate with the Board, but the Board declined to take action in the matter. Mr. Frank Hards negotiated with the owner, but witness could not say how Hards first got his information as to the property, whether from witness or from the advertisement in the paper. The property was subsequently offered by auction, and they (witness and Hards) bought it. He believed they gave something between 400l. and 500l. for it. Afterwards the Board obtained compulsory powers, and in about the middle of 1885 they gave notice to treat. That notice was served on the purchaser, a Mr. Thomson. In explanation of this statement, witness said that Mr. Hards and himself "thought it better, so that Mr. Goddard should approach the matter perfectly unbiased, that another name should appear," so that Thomson, while he appeared to be the owner, was really representing witness and Hards. There was a conveyance of the property to Thomson. The Board paid 700l. for the property. Witness's valuation was 660l. Goddard saw the property himself, and increased the valuation to 700l. Witness had had no financial transactions with Goddard beyond receiving from him a sum of 31l. 4s. 10d. for assistance with reference to some railway matters referred to him as umpire, and smaller amounts, perhaps 10l. in all, for charities, &c.; the whole of those payments did not exceed 45l., and not one penny of that sum had any connexion with Board matters. The profit

made on the Europa-place transaction was about 240l. Witness received 124l. as his share of the profit. Witness and Hards bought another property at Hughes's Fields, Deptford, in precisely the same way as had been described in regard to the Europa-place property. The Deptford property was put up to auction on Nov. 28, 1884, and witness and Hards bought it for from 1,400l. to 1,500l. He could not say the exact amount. They knew that this property was likely to be required by the Board. A Mr. Francis was the nominal buyer in this case, not Mr. Thomson. The last named was a pupil of Mr. Hards, or, rather, of the old firm of Hards, Vaughan, & Jenkinson. He was a pupil of the old firm before Mr. Frank Hards was connected with the business at all. Witness valued the Hughes's Fields property at 2,800l., which was at the rate of 2d. a foot, other properties quite near to it being absolutely leased at a rate that would bear out that value. Mr. Goddard valued the property at 3,000l., and the Board gave that amount for it. Witness's profit on that transaction was 500l., but that was not half the profit. Mr. Hards had all the rest, because "he financed the whole matter," while witness put no money into it. It was about two years and a half after the sale by auction that the valuation was made by witness and Mr. Goddard. The amount of "Mr. Francis's" claim was 4,300l. From the first, witness's opinion was that the value of land was 2d. a foot, so that the claim sent in in the name of Francis, but really on behalf of witness and Hards, was for a very great deal more than the property was worth; but in explanation of this, witness said he wished Mr. Goddard to approach the matter perfectly unbiased; he wanted it to go before Goddard as any other claim would go. He never made the slightest suggestion to Goddard on the subject. He knew of no other instances in which property which was known to be required by the Board had been bought up or speculated upon in this way. Examined by Mr. Bosanquet, witness said he did not assist Francis to draw up his claim. He did not give a receipt for the 500l. to Hards, nor did he find any money for the first named transaction (Europa-place), although in that case he believed he received half the profits. Although he put in no money, it was a joint speculation. He assumed that he used his knowledge that the property had been offered to the Board. Examined by the Chairman, witness said that he knew the Board were pretty sure to take the property when they obtained the Parliamentary powers they were then seeking; but he was also quite sure that the Board would pay 700l. to anybody else. He could not influence Mr. Goddard's mind one sixpence. Did not know of any other official or member of the Board who had purchased property that had been scheduled by the Board. Cross-examined by Mr. Winch, witness said he was appointed "assistant-valuer" of the Board in 1885. Could not give any particular names that turned up often as claimants against the Board, except perhaps "Smith," "Brown," "Jones," and "Robinson"; but certain uncommon names had not appeared to his knowledge frequently. In June, 1886, witness purchased a ground-rent of 50l. per annum, secured on property at Greenwich. He sold it to the purchaser of the leasehold interest in 1887. The property had been scheduled by the Board in connexion with the approach to a tunnel they were seeking for powers to make under the river, but at the time he purchased it no proposal affecting the property was before the Board, and at the time he sold it the Bill for the tunnel had only passed its second reading. Since that time he had not had one sixpence interest in the property, which had not yet been taken by the Board. So scrupulous had he been in this matter that he would not deal with it at all, and on his suggestion, an outside valuer, Mr. Robert Vigers, had been consulted, and had fixed the value of the property. Asked why he had adopted a different course in this transaction to that pursued in the other two, witness said it was "because Mr. Goddard had talked about his retirement for some time, and he thought, perhaps, that that might make him the responsible officer for valuations." Questioned by the Chairman, witness said he meant by this to say that in that event he would have been at the head of the office, and the person to decide on the valuation, for he thought there was a great difference between the head of the department

responsible for the valuation, and a subordinate. Did not contemplate the eventuality of Mr. Goddard's retirement at the time the Europa-place and Deptford matters were going forward, although it was "in the dim distance." In answer to Mr. Winch, witness said his salary at the Board was now 350l.

Mr. Thomas Blashill, the present Superintending Architect to the Board, recalled, produced the plans and the documents in regard to Mr. Bowyer's line of frontage case, which came before the late Mr. Vulliamy in the first instance. The witness described the usual procedure in such cases. When an application of the kind came in, the following was the course pursued:—The two parties on each side of the premises in question were written to at once from his (witness's) department. A fortnight was allowed for a reply. The Vestry in whose district the case occurred was also written to, and if within a fortnight no reply was received, it was concluded that the parties had no objection to offer. If any reply was sent, it was dealt with according to its nature. At the end of the fortnight he (witness) wrote his report upon the case, not having seen the opinions of the other parties to whom the application had been sent. Then, at the next meeting of the Board, he brought up his report, with the documents before the Board. If his report, and the answers received from the neighbours and from the Vestry, were in favour of the application, the Board usually passed it without referring it to the Building Act Committee at all; but not invariably, because the Chairman of the Building Committee looked through the whole of the papers, and if any point struck him which he thought had not been noticed, he got it referred to the Building Act Committee, or took such other action as seemed necessary. But if either of the parties or the Vestry objected, the case went, as a matter of course almost, to the Building Act Committee. In the case of Mr. Bowyer's application, the Vestry objected, so did the adjoining owners, and the matter was referred to the Committee, with his (witness's) report thereon. Asked as to whether it was his personal report, Mr. Blashill said a gentleman from his office viewed the premises, and checked the correctness of the plan sent in by the applicant. The same gentleman then drafted the report for witness, and if he (witness) approved of it, it became his report. Mr. Millwood, as a rule, now did that work, and Mr. Hebb, the Assistant-Architect, looked over it. He (witness) saw the drawings without having seen the draft report at all; from his inspection of the drawings he made up his mind as to the merits of the application, and dealt with the draft report accordingly, after which the report became his. In difficult and disputed cases, the Committee, as a rule, acted on his advice as the Superintending Architect, but he did not always give positive advice one way or another. There was a general uniformity of practice on the part of the Board as to the allowance or disallowance of applications to build forward. Although in disputed and difficult cases of the kind some time was lost in referring the matter to and fro between the Board, the Vestry, and the adjoining owners, yet the great majority of cases were decided without such delay.

Mr. William Brady, recalled and further examined, produced certain letters and other documents regarding the Europa-place, Deptford, and Greenwich properties.

Mr. Edgar Joseph Harper, recalled, said he was in the employment of the Board, in the same department as Mr. Brady, and his duties were, generally, to assist Mr. Robertson in the Estates Branch. He (witness) registered particulars of all properties purchased by the Board as soon as they were purchased. The witness gave evidence as to the duties performed by several other gentlemen in the office.

Mr. George Watson Haines, recalled, was asked to explain why he gave 10l. to Mr. Lancaster, a clerk in the Architect's office, as deposed to by Mr. Ellis, the secretary to Spiers & Pond. Witness said he had not the slightest recollection of the circumstance, and he did not know Mr. Lancaster. (Mr. Lancaster being asked to stand up, witness said he did remember his face, but did not remember giving him any money.)

Mr. Frederick John Lancaster, recalled, said that he did not receive the 10l. from or through Spiers & Pond. Mr. Haines had



evidently forgotten the incident connected with the 10*l*. It was some months after the Criterion plans had been passed, and after the theatre had been reopened, that Mr. Haines came to the office, and passing through a corridor, witness met him, and he (Haines) said, "I have something for you." Witness said "What is it?" Haines gave him a 10*l*. note, and said "It will do for you to go to the sea-side." Witness asked what it was for, but Haines told him to "never mind." That was the only payment of the kind witness ever received.

Mr. Haines, recalled, said he had no recollection of giving the 10*l*. note to the last witness, but if he gave it, it must have been in connexion with the "Criterion."

Mr. Matthew Goddard, recalled, made several additions to the list of cases in which he had received "presents" of money from tenants of public-houses which came into the possession of the Board, the sums ranging from 10*l*. to 25*l*. and 50*l*.

Mr. John Hebb, Assistant Architect to the Board, was the next witness called, and deposed that he had been head of the Building Act Department of the Architect's office for ten years. He assisted the Superintending Architect in all things which related to building construction, but not in matters of finance or compensation. Questioned as to his applications to theatre managers for tickets for boxes and stalls, he said he only recollected applying for such tickets for two members of the Board, Mr. Furness and Mr. Fell. Had not made any applications for such favours since he was reprimanded by the Chairman on receipt of Mr. Hare's letter. Did not recollect sending Mr. Lancaster to get boxes or seats at Sanger's Amphitheatre. Lord Herschell was proceeding to examine the witness with reference to the circumstances attending the definition of the line of frontage in the Brixton Bisc case, when he (witness) said he wished to make a personal statement. He observed that the Chairman had, on a former occasion, remarked that the Board ought not to have entrusted this important work to a temporary man, and had suggested that witness was incompetent for the work. He should like to say that he had been educated as an architect. He was articled to an eminent man for five years, and travelled abroad for some time,—about a year and a half,—to complete his education. On his return he joined his master,—first as assistant, and afterwards as his partner. He was his master's partner for about ten years, carrying out some very important works, assisting him in all his buildings, and practising at the same time on his own account. He came to the Board with excellent testimonials, and had performed very important duties. He had the control of all work in connexion with the operation of the Building Act and the Metropolitan Management Act, so far as it related to buildings. He had acted as Superintending Architect, by Mr. Villiamy's appointment, and with the consent of the Board. He was a man, he submitted, in every way of equal professional status to Mr. Villiamy or Mr. Blashill, and was perfectly competent to perform the work in question. But his lordship's remarks were calculated to cast a slur upon his professional character. He had never had any slur or imputation upon him until these last few months. He had always been looked upon as an honourable man. He was an honourable man, and there was no transaction of his life that he was ashamed of, or which would not bear the light of day.

The President said he thought that it would possibly have been better not to have made that observation after the correspondence which has been before the Commission as to the theatres with regard to applications for orders. He hoped the witness did now, however, think that that was an improper proceeding.

The witness said he attached no importance to it. He did not consider that was any imputation on his honour or his honesty. He was led into that correspondence by Mr. Harris. There was nothing in that correspondence of which he was ashamed. It was utterly false to say that he levied blackmail upon Mr. Harris or any other manager.

Other witnesses have since been examined, including Sir Joseph Bazalgette, the Engineer, and Lord Magheramorne, the Chairman of the Board, but owing to the voluminousness of the evidence we must break off here until next week.

We are informed that the Council of the Surveyors' Institution have applied to the Commissioners for an official copy of all the evidence, given or to be given, by surveyors and others during the course of the inquiry.

#### NOTES ON SEWAGE PURIFICATION BY ELECTROLYSIS.\*

The question of the disposal of sewage has occupied the attention of engineers and chemists for many generations past, and, regarded from a hygienic point of view, cannot be too thoroughly considered.

Before entering into the particular subject upon which I have the honour of being invited to address you, I should like to turn your attention to the various processes tried, and found wanting, since the year 1762.

We have lately heard a great deal about the treatment of sewage with sulphate of iron, lime, sulphate of alumina, permanganates, &c., &c. It is a most remarkable fact that claims have lately been made *in re* the sulphate of iron process as if it were entirely new. The following list will show the fallacy of this (see Table I.):—

TABLE I.

| NAMES OF SUBSTANCES.                                                                      | Inventor.                 | Date. |
|-------------------------------------------------------------------------------------------|---------------------------|-------|
| Sulphate of iron .....                                                                    | Deloigne .....            | 1762  |
| Chlorine .....                                                                            | Hallé .....               | 1785  |
| Lime .....                                                                                | Estienne .....            | 1802  |
| Powdered charcoal .....                                                                   | Grand .....               | 1805  |
| Chlorine and chloride of lime .....                                                       | Grand .....               | 1805  |
| Ashes .....                                                                               | Chauvete .....            | 1815  |
| Sand .....                                                                                | Duprat .....              | 1818  |
| Sulphate of iron .....                                                                    | Brant .....               | 1824  |
| Chloride of lime .....                                                                    | Labrousque .....          | 1824  |
| Waste chloride of manganese .....                                                         | Payen and Chevalier ..... | 1825  |
| Sulphate of lime .....                                                                    | Siret .....               | 1827  |
| Animal bar oil .....                                                                      | Guéart and Sanson .....   | 1833  |
| Peat .....                                                                                | Pottetum .....            | 1836  |
| Charcoal and calcined marl or river mud .....                                             | Siret .....               | 1837  |
| Sulphates of iron and zinc with tan and fat .....                                         | K. Siret .....            | 1837  |
| Earth, lime or waste substance .....                                                      | D'Ar .....                | 1840  |
| Peat ashes .....                                                                          | Krafft and Saquet .....   | 1840  |
| Metallic oxides and carbon .....                                                          | Sir Van. Burnett .....    | 1840  |
| Chloride of zinc .....                                                                    | Hompes .....              | 1841  |
| Trade refuse, charcoal, and ashes .....                                                   | Albert .....              | 1842  |
| Powdered lignite .....                                                                    | Jourdan .....             | 1843  |
| Impure acid .....                                                                         | Siret .....               | 1843  |
| Sulphate of zinc, charcoal, and clay .....                                                | Gagnage and Regnaud ..... | 1844  |
| Persulphate of iron .....                                                                 | Barnett .....             | 1845  |
| Sulphate of iron .....                                                                    | Du Bous .....             | 1845  |
| Sulphate of iron and zinc .....                                                           | Deloigne .....            | 1846  |
| Lime and pre-precipitating tanks .....                                                    | Higgs .....               | 1846  |
| N. rate of lead .....                                                                     | Leclerc .....             | 1847  |
| Waste salts of iron, lead, zinc, &c., with pyroclastic matters, ashes, &c. .....          | Brown .....               | 1847  |
| Type 1. Quate and persulphate of iron .....                                               | Clément .....             | 1847  |
| Improvement of manganese .....                                                            | Young .....               | 1847  |
| Dr. de Sa. weed, lime, and sulphate of lime and zinc .....                                | Salman .....              | 1848  |
| Peat charcoal .....                                                                       | Rogers .....              | 1848  |
| Charcoal, &c., metallic salts, &c. .....                                                  | Légar .....               | 1849  |
| Spent tan, carbonised .....                                                               | Tarling .....             | 1850  |
| Fresh bark, sulphate of iron, and peat charcoal .....                                     | Angely .....              | 1850  |
| Metallic sub-salts, as of iron, alumina, &c. .....                                        | Brown .....               | 1850  |
| Milk of lime and filtering the deposit .....                                              | Wicksteed .....           | 1851  |
| Acids and metallic salts, and filtrations through charcoal, clay, peat, gypsum, &c. ..... | Dover .....               | 1851  |
| Lime, sulphates of alumina, and zinc and charcoal .....                                   | Clément .....             | 1852  |
| Lime, magnesium earth, sulphate of zinc or iron and vegetable charcoal .....              | Gilbey .....              | 1852  |
| Sifted ashes, breeze, or peat charcoal .....                                              | Perks .....               | 1852  |
| Sulphate of zinc, potash, alum and acid with waste tan, ashes, lime, soot, &c. .....      | Fuel .....                | 1853  |
| Metallic sulphates, metallic chloride, or charcoal and magnesium salts .....              | Fers .....                | 1853  |
| Peat or bog earth containing salts or oxides of iron .....                                | Dunstable .....           | 1853  |
| Peat and other charcoal and chloride of sodium, &c. .....                                 | Ma pherson .....          | 1853  |
| Animal char., alum., carbonate of soda salt, gum .....                                    | Maitland .....            | 1853  |
| Magnesia and lime with sulphurous and carbonic acids .....                                | Statt and McDougall ..... | 1854  |
| Lime and finely divided charcoal .....                                                    | Wicksteed .....           | 1854  |
| Richford coals .....                                                                      | Herrpath .....            | 1854  |
| Soft sludge from alum works with lime and charcoal .....                                  | Manning .....             | 1854  |
| Peat charcoal carbonised with oil of vitriol .....                                        | Longmaid .....            | 1855  |
| Alum sub s. or shale, and other aluminous minerals, with lime and charcoal .....          | Manning .....             | 1855  |
| Magnesian and permanganates .....                                                         | Condy .....               | 1857  |
| Superphosphate of lime with magnesia and lime .....                                       | Blyth .....               | 1858  |

To this list may be added others containing combinations of the above, ringing the changes upon iron, lime, alumina, &c., which illustrate the reckless way in which inventors endeavour to apply their knowledge without first ascertaining what has been previously done in the matter, and how far it has been found to be successful.

In the year 1844, lime, mixed with water, was used for the precipitation of sewage. The sewage precipitate was called sewage guano, and, to cut a long story short, it was found that the product had little or no agricultural value. The late Dr. Letheby (whose pupil I was), in the year 1857 recommended the Metropolitan Board of Works to adopt the lime process to precipitate the sewage of London. He also suggested that sulphate of iron might be tried. In this short paper it is not my intention to criticise the many processes

in use at the present time, as there is no doubt all are doing their best to solve the question; but I must protest against sewage farms, where sewage is allowed to percolate through the land without previous treatment. Rye-grass is grown, and ultimately eaten by cattle. Sewage contains myriads of ova; they become attached to the grass and other green fodder; this affects the cattle, produces measly meat, and I need hardly enlarge upon the results of eating it.\*

It may, perhaps, seem curious that I should say so much about chemical treatment, when the special subject of my paper is electrolysis; but electrolysis is nothing more than a chemical action produced by an electric current.

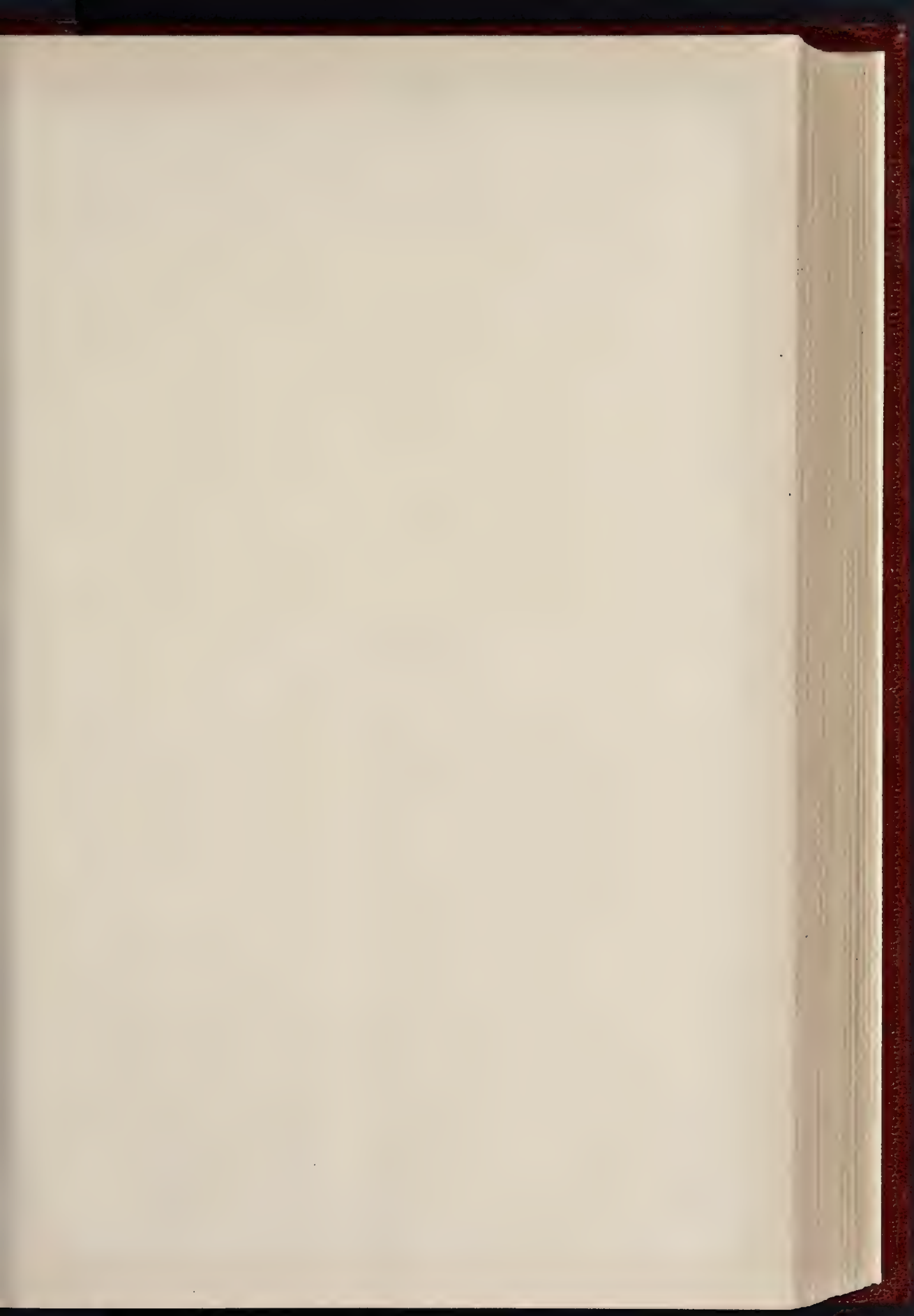
It is quite ten years since I carried out my first experiments in electrolysis, but in those days the available electric apparatus had not attained such completeness as we now have in it. I first of all wish to remove an impression which, I have been given to understand, is lurking in some minds—that it is impossible to electrolytically decompose pure water. Water is easily decomposed, provided the current of electricity is of such intensity that it can overcome the resistance. Nicholson Carlisle decomposed water in the year 1800. The

decomposing effects produced are precisely in accordance with the chemical equivalents of the substances electrolysed; for instance, the same amount of electricity that would reduce 56 parts of iron from its solution would reduce 207 parts of lead, or 16 parts of oxygen, &c., &c. This is practically the explanation of the whole system; for the chemical changes which take place in sewage when it is electrolysed depend chiefly on the well-known facts that water and sodium, magnesium, and other chlorides (which are always present in sewage) are split up into their constituent parts. Thus, we have at the positive pole chlorine and oxygen set free, and these elements are liberated in a nascent state, a condition in which they are intensely active, so that the organic matter in the sewage is rapidly oxidised and burnt up to innocuous

\* A paper by Mr. William Webster, F.C.S., read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, as elsewhere mentioned.

\* It is fair to say that the accuracy of this statement was strongly questioned by Mr. Strachan, of Glasgow. Mr. Webster said his assertion was based on the statements of eminent chemists.





THE BUILDER, JULY 21, 1888.

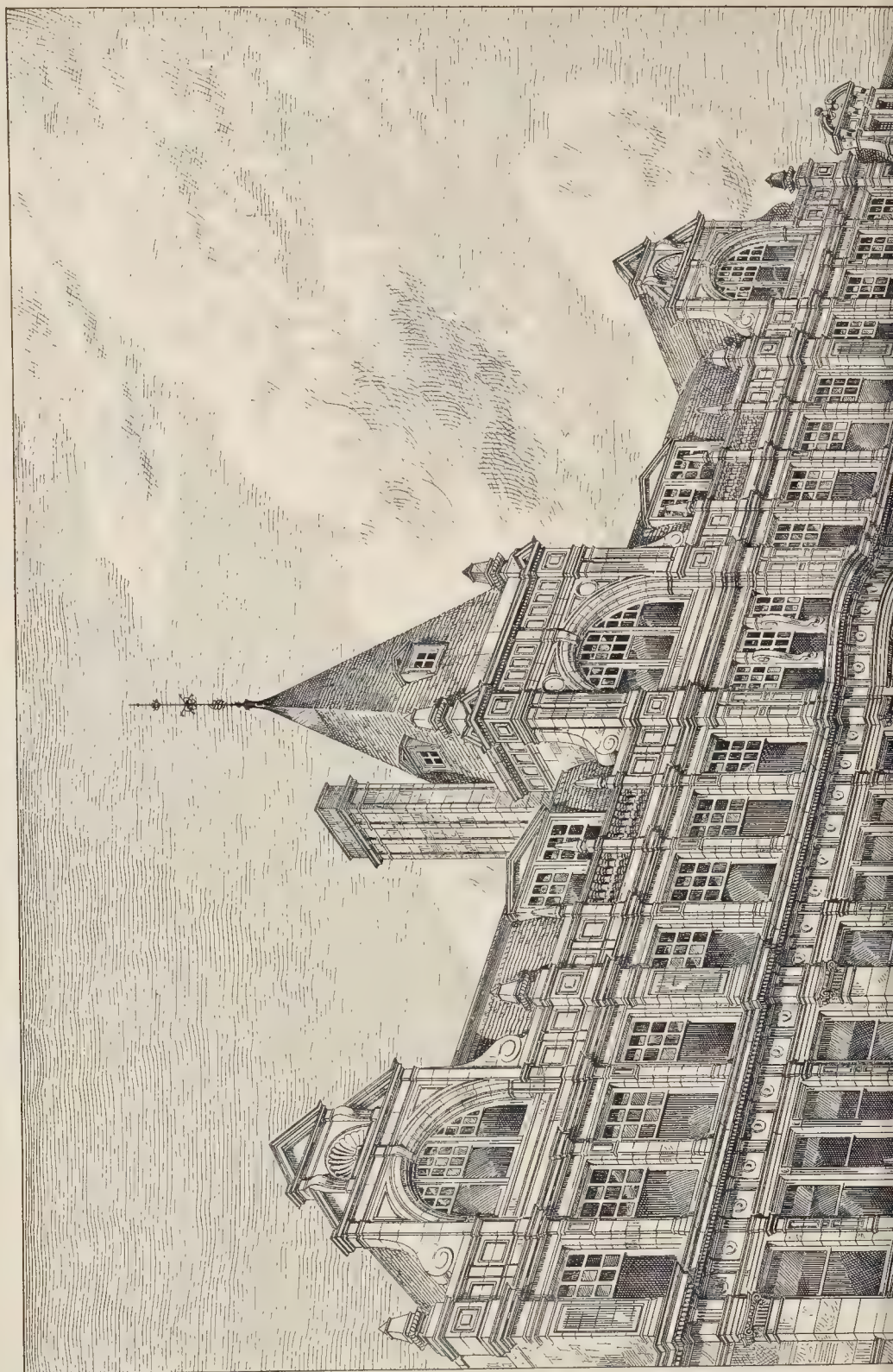


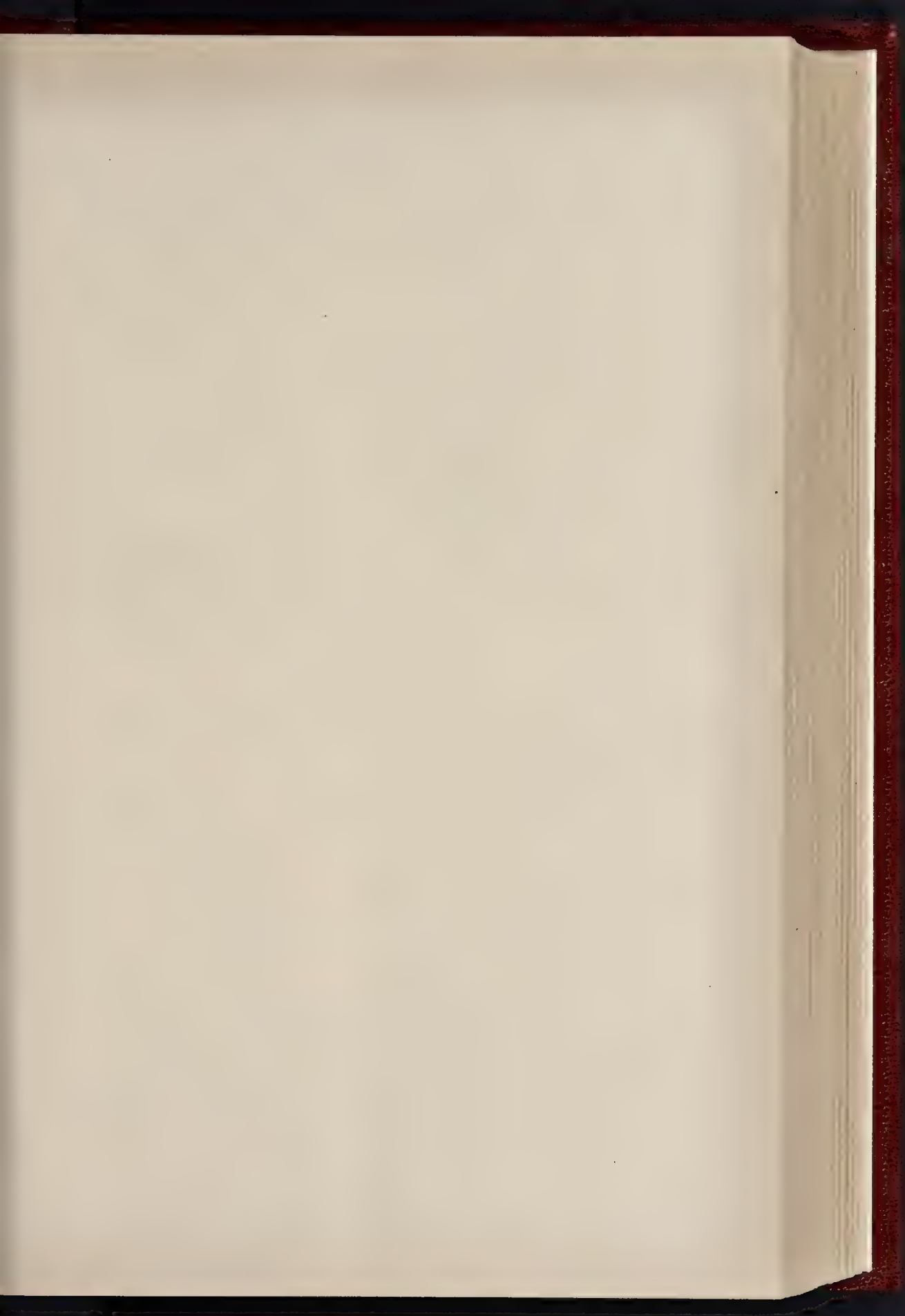


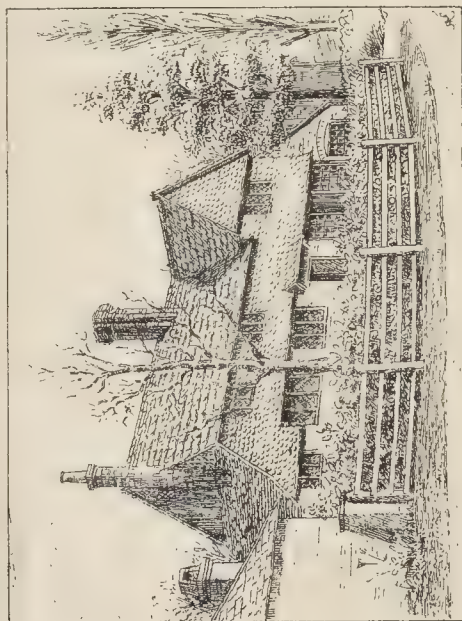


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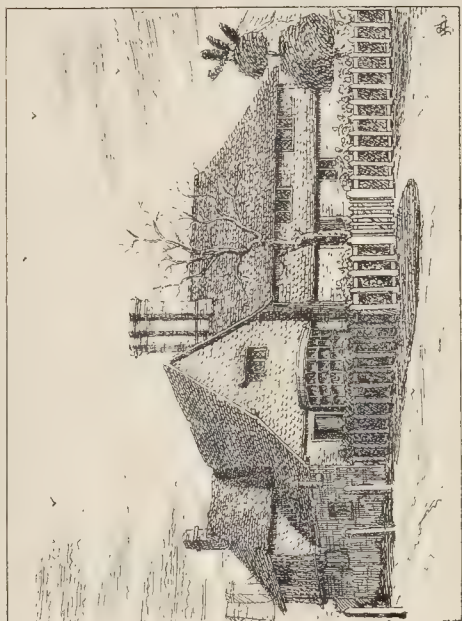








AT A.F.O.D



AT A.FOLD

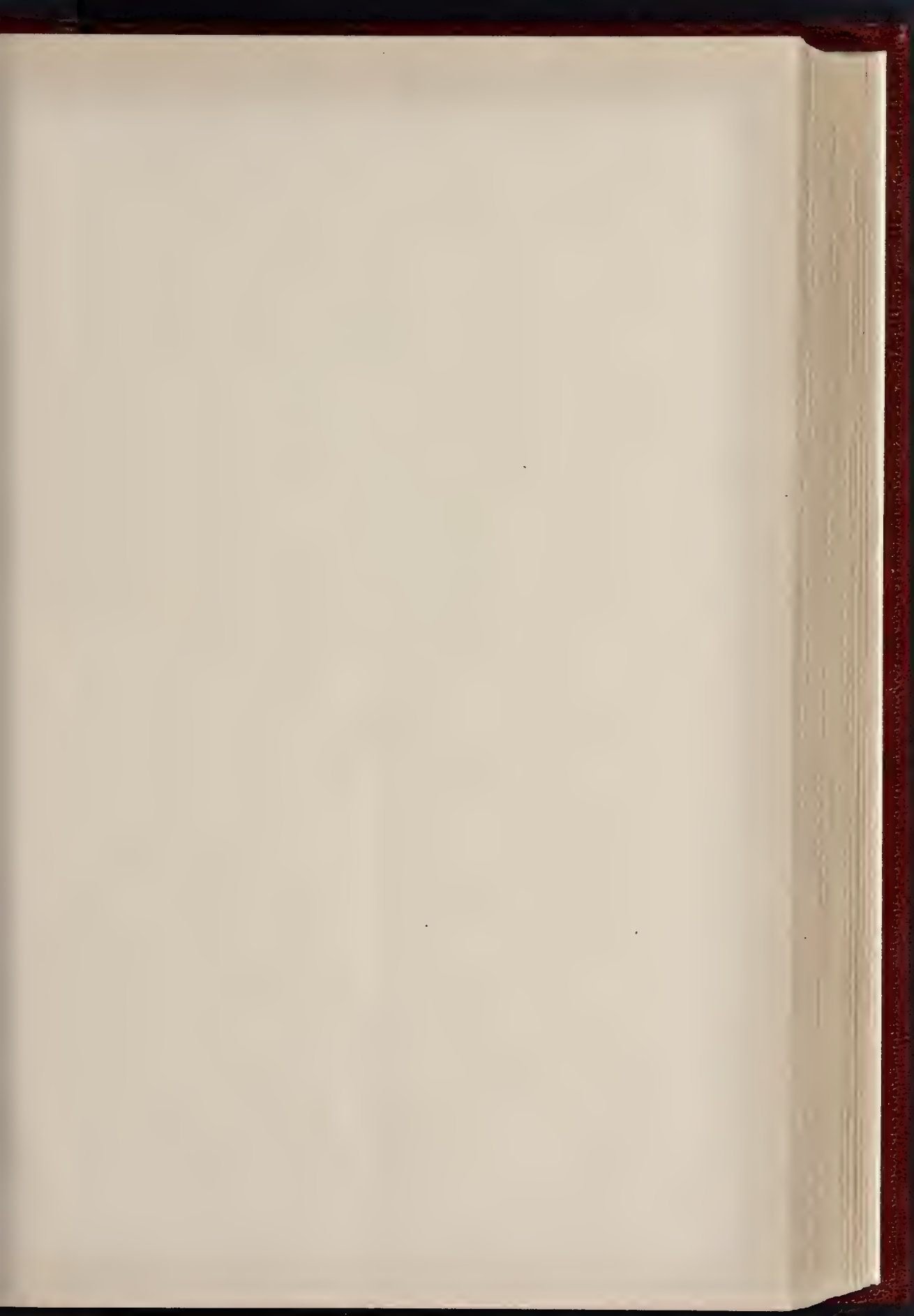


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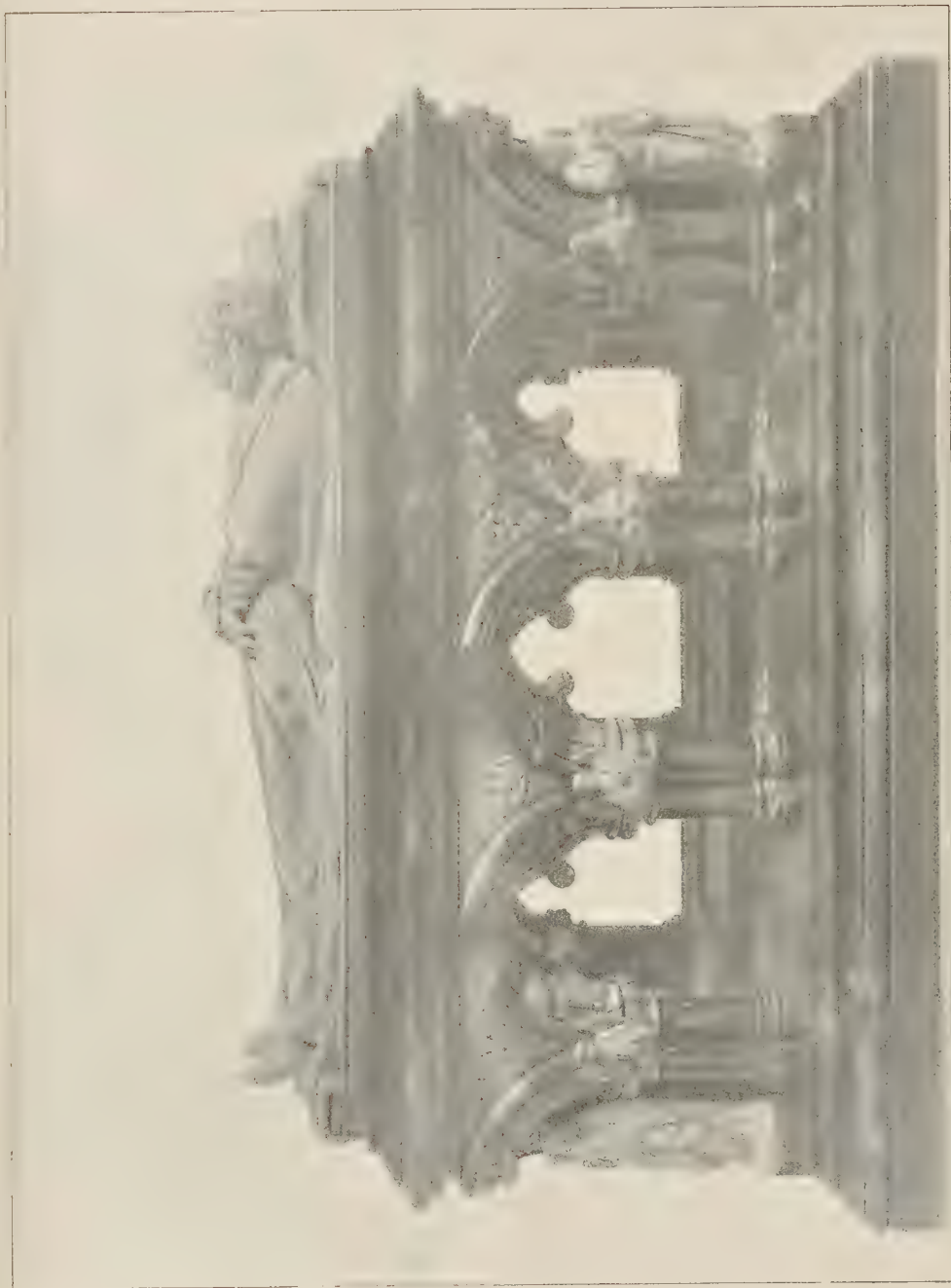


AT FOLD HOUSE.



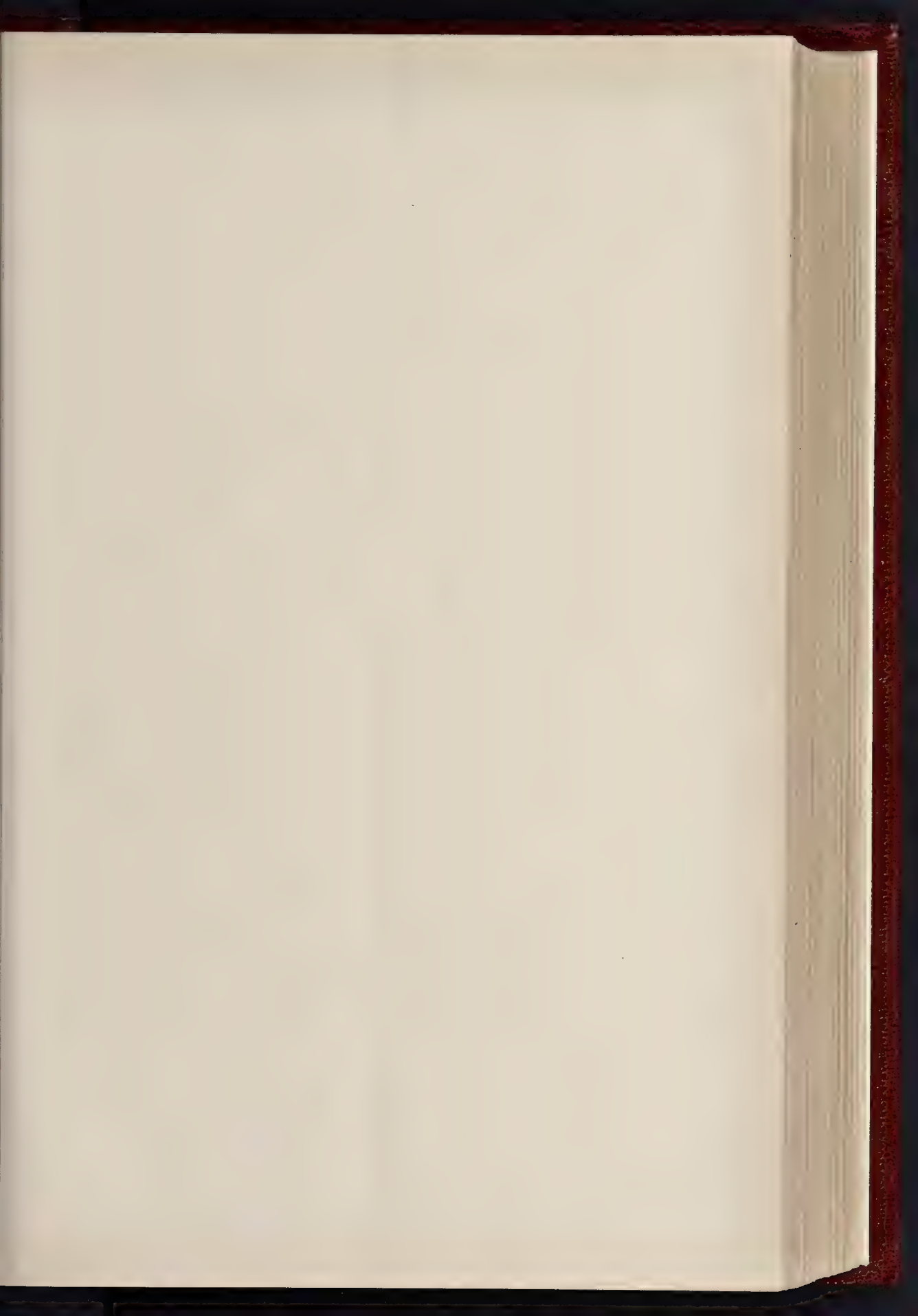


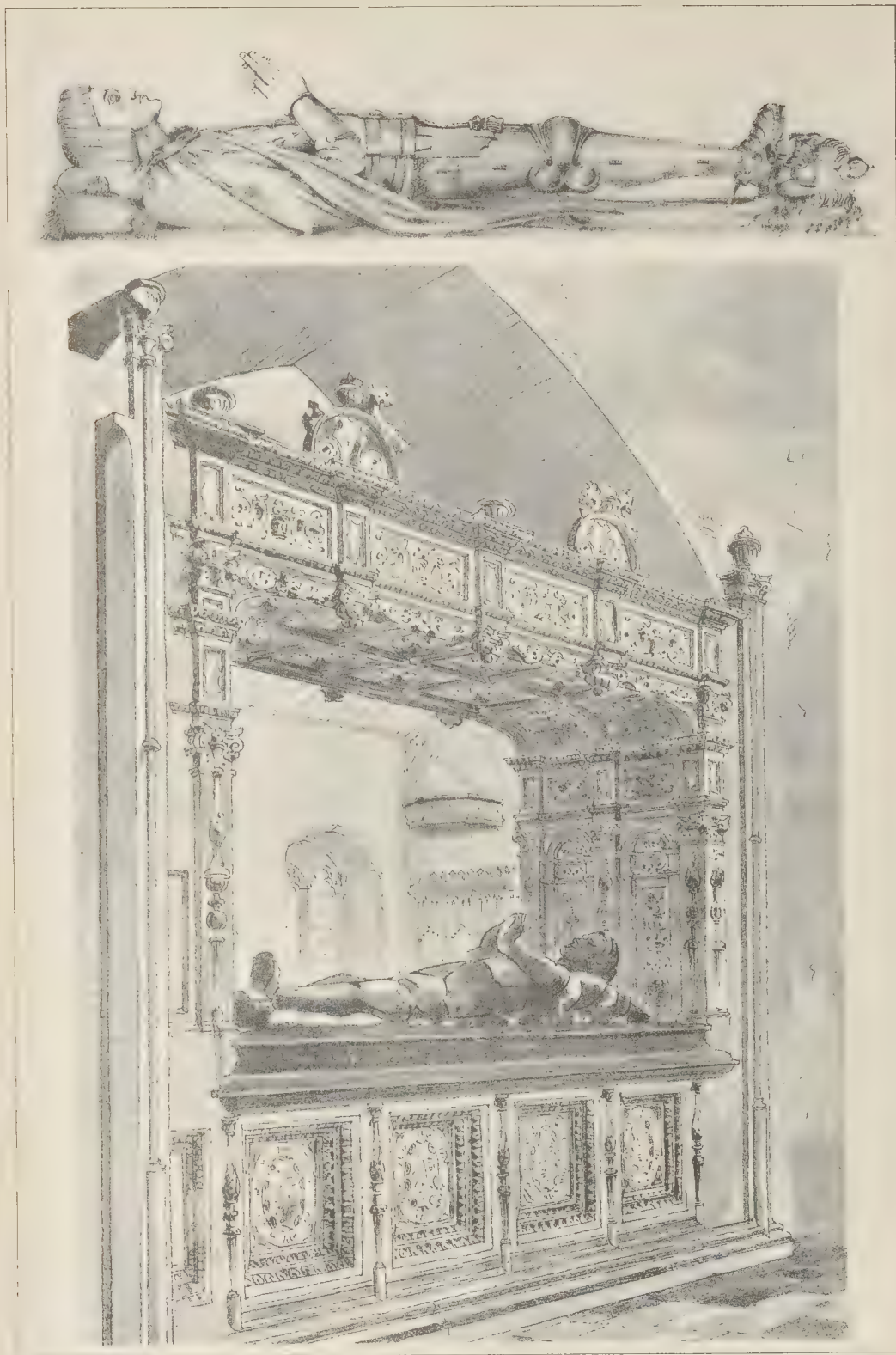
THE BUILDER, JULY 21, 1898.



THE DUDLEY MEMORIAL, WORCESTER CATHEDRAL.—MR. JAMES FORBATH, SCULPTOR.



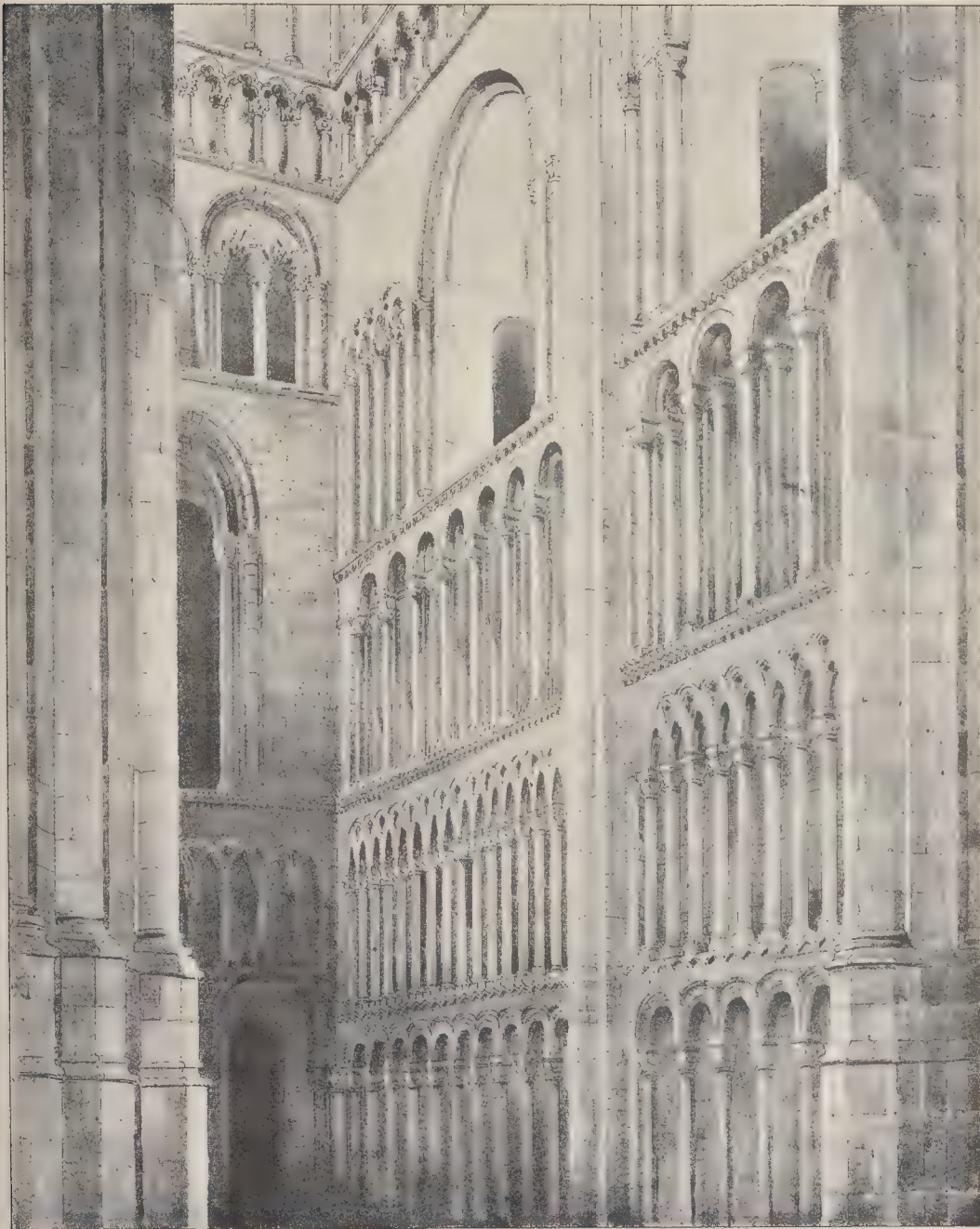




TOMB OF LORD HENRY MARNEY, LAYER MARNEY CHURCH, ESSEX.

FROM A DRAWING BY MR. ARNOLD B. MITCHELL, A.R.I.B.A.



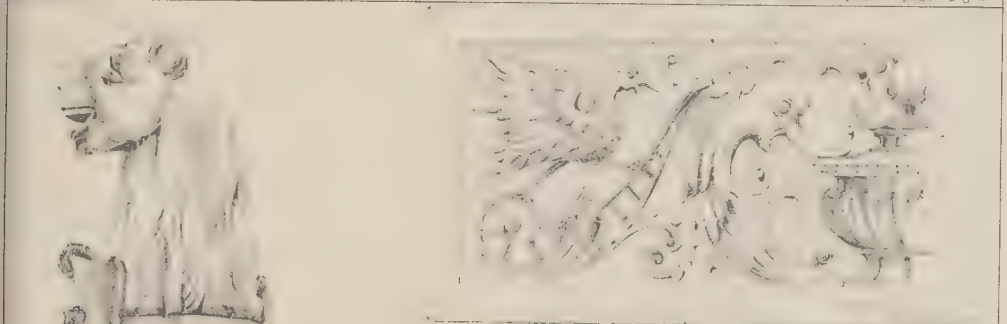


INK PHOTO. SPRAGUE & CO. 2, MARK LANE. PATRON ST. LONDON E.

A CORNER OF ELY CATHEDRAL.—FROM A DRAWING BY MR. ARNOLD B. MITCHELL, A.R.I.B.A.



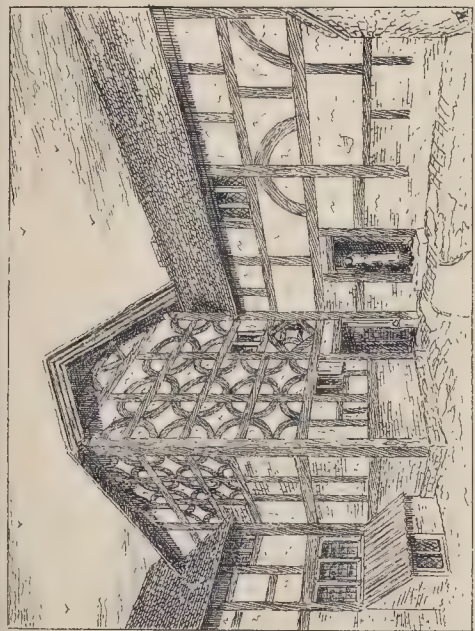




EDWARD CARVED IN OAK IN THE CHURCH.  
LAYER MARNEY.



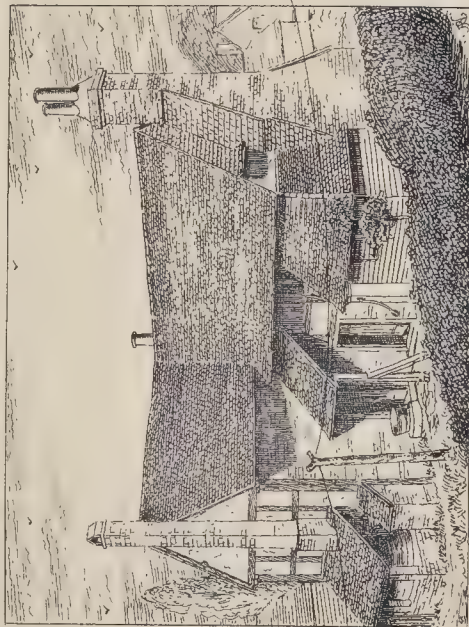




AT BRAMLEY.



AT SHAMLEY GREEN.



PLUNKS SHAMLEY GREEN.



AT SHAMLEY GREEN

PHOTO LITHO, NORWICH & A. 22 MARKING AND ANGLICAN ST. LONDON E.C.

OLD COTTAGE ARCHITECTURE. - FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.





compounds. So rapid is this action that I will now act on a little Crossness sewage, and produce a disinfecting liquid, which is nothing more or less than hypo-chlorous acid, the strongest oxidising agent that is known. To obtain this quickly I must separate the positive action from the negative by a porous diaphragm. At the negative pole I obtain ammonia, potash, soda, magnesia, &c. So strong is the action of oxide of chlorine that I have found no pressed carbon plates would stand its action. I am therefore compelled in practice to use cut carbon or coke. (Demonstration made.)

It was this fact that made me investigate the cost, and the result was, knowing that iron salts were of great use in precipitating organic matter in solution, that I experimented with iron electrodes, for the oxidising acids produced by this action being probably 100 times more active than any acids produced by chemical processes alone, it necessarily followed that the iron salt produced must have similar properties. The nascent chlorine and oxygen generated partly unite, and, with the water, form hypo-chlorous acid; the positive iron plate being attacked, and ferrous hypo-chloride formed; but a portion of the hypo-chlorous acid attacks the organic matter, for it is well known that putrefying sewage has a strong affinity for oxygen.

To still further strengthen this action, I have lumps of carbon cast into the iron plates, thus securing a supply of the before-mentioned acid.

The iron plates are common cast-iron run direct from the furnace into this form instead of pigs, and are used for the positive poles, the negative plates being thin rolled sheet. The positive plates are gradually acted on by the acids produced, but the negative plates are not acted on, and will remain in the same condition for years; this is so well known that I need not enlarge upon it. I have estimated that the waste of iron at the positive pole is about 1 gr. per gallon, but, of course, this entirely depends upon the electric current used. The hypo-chlorite of iron formed at the positive pole is acted on by the free ammonia, sodium, potassium, and magnesium hydrates, and the ferrous hydrated oxide precipitated. This particular oxide of iron has the property of combining with organic matter, and it is a peculiarity of this salt to take a white hue, and then by exposure to the atmosphere to become green, and ultimately an ochrey red colour.

This action can be seen almost daily in any dye-house during the dyeing of buffs. The cotton goods (representing organic matter) are dipped into an iron solution, and then passed through an alkaline bath; the shade is green, but slight exposure to the air produces the buff colour, the oxide of iron being precipitated within the fibres of the cotton. The ferrous hydrated or protoxide of iron is so beautifully precipitated, one may say, in its most active condition by this electrolytic process, that it takes up more organic matter than if precipitated chemically, for by chemical precipitation the iron oxide carries a large part of the suspended matter in the sewage with it, but only traces of the dissolved organic matter. In the electrical process the whole of the matter suspended is carried with the oxide of iron, together with a considerable portion of the organic matter in solution, and if necessary, the whole of the soluble organic matter can be oxidised. The precipitate itself is carried to the surface by the numerous bubbles of hydrogen issuing from the negative pole, and the effluent may be run off quite clear from below, or may be run with the precipitate into settling tanks, where the deposit will take place in from half an hour to two hours; the precipitate, being exceedingly flocculent, subsides readily. The sludge formed does not hold so much water as by chemical process, and presses without any addition of lime. The effluent is less alkaline than the natural sewage, and, if necessary, can be rendered neutral by passing through coke filters arranged in such a way that the electric current can be applied, thus further purifying the effluent and delivering it in such a state that, personally, I should have no objection in drinking it. The reason of the alkalinity being reduced is that a small quantity of free ammonia is carried off with the hydrogen gas at the negative pole, and also by the formation of hypo-chlorous acid. It is by means of this coke filter that potable water can be purified either on a large or small scale, and the treated sewage is not liable to secondary

fermentation, nor does it form a precipitate when mixed with ordinary river water. The chlorides are slightly diminished in quantity, owing to the escape of nascent chlorine at the positive pole. The amount of soluble mineral matter is not increased in quantity, as in ordinary precipitating processes.

The chloride of lime of commerce is really hypo-chlorite of lime. It has been suggested that the hypo-chlorous acid may possibly be as objectionable in its after effects as the salts of lime; but this is not the case, as hypo-chlorous acid is an unstable compound, which, having delivered up its oxygen in oxidising organic matter, changes into hydro-chloric acid, which neutralises the alkalinity of the sewage.

As I have already demonstrated that hypo-chlorous acid can be obtained in quantities by means of a porous cell enclosing positive pole, so likewise by enclosing the negative pole a solution of ammonia, &c., can be obtained from the raw sewage.

I have brought with me a weak solution of the disinfecting fluid obtained from sewage twelve months ago; also a sample of an effluent eight months old. I have shown that the sewage can be purified to any extent, even to conversion into a disinfectant; it therefore only remains for me to enter into the question of cost, which I will do as briefly as possible, and it is just as well to mention that this will be partly ruled by the particular state of purity you require in your effluent.

The chief expense is the engine power. My experience up to the present time is limited to treatment of about 100 gallons of sewage at any one time; and from a large number of experiments I found it would be possible to treat this quantity with about one-third h.p.; the dynamo and engine were unsuitable for my experiments, as the dynamo was only fit for electric lighting, and the engine twenty-five years old—without a governor; I should, therefore, prefer to think the h.p. over-estimated. The time occupied in treating every 100 gallons varies from five to ten minutes. The consumption of iron was one grain per gallon; the cost of this is easily estimated when one knows the market price of pig-iron. By kind permission of the Metropolitan Board of Works, I have erected works at my own expense at the Crossness Outfall of sufficient capacity to treat sewage at the rate of one million gallons per diem, as I have sufficient confidence in this process to risk the large outlay entailed. For this I have had an Edison-Hopkinson dynamo specially constructed, giving an output of 1,600 amperes and twenty volts.

Unfortunately, the electrical portion of the works is not yet completed, or I should have hoped to have had the pleasure of inviting you to inspect them.

The question of cost resolves itself into this: The more iron plates you introduce into the system the greater the surface, and the lower the resistance; consequently, the less h.p. required. The increase of the iron plates is only an increase of prime cost, and does not mean a greater waste of iron; this means a saving of labour, as the more iron originally used the less frequently it would require renewal.

I hope to prove that by using positive plates 1 in. thick their duration will be from five to ten years. If the proportion of one-third h.p. to 100 gallons in ten minutes holds good, as I am inclined to think it will, then 25 actual h.p. would be capable of purifying 1,080,000 gallons of sewage in twenty-four hours. I should much have liked to have gone into more minute details connected with these experimental tests, but until I have verified the present results on a practical working scale, I feel it would be premature to quote figures.

Appended are the results of a few analyses of sewage before and after treatment:—

| Date of Experiment. | Appearance.             | Odour. | Nitrogen as   |                    |                     |       | Chlorine as Chlorides. | Oxygen required to oxidise organic matter. | Total Solid Matter in Solution. | Loss on Impregnation of Total Solids. | Suspended Matters. |
|---------------------|-------------------------|--------|---------------|--------------------|---------------------|-------|------------------------|--------------------------------------------|---------------------------------|---------------------------------------|--------------------|
|                     |                         |        | Free Ammonia. | Albumenoid matter. | Nitric and Nitrous. | None  |                        |                                            |                                 |                                       |                    |
| 1888, Mar. 26       | Raw Sewage, very turbid | Bad    | 2.59          | 0.47               | None                | 9.74  | 1.95                   | 61.73                                      | 65.28                           | 39.47                                 | 7.09               |
| Apr. 20             | Effluent, clear         | None   | 2.30          | 0.36               | None                | 87.43 | 1.107                  | 42.43                                      | 9.14                            | None                                  | 6.13               |
| Apr. 20             | Raw Sewage, very turbid | Slight | 1.88          | 0.19               | Trace               | 5.27  | 1.11                   | 7.90                                       | 47.31                           | 33.01                                 | 14.30              |
| Apr. 27             | Effluent, clear         | None   | 1.63          | 0.14               | 0.023               | 4.87  | 0.93                   | 38.00                                      | 43.0                            | 2.01                                  | 0.97               |
| Apr. 27             | Raw Sewage, very turbid | Slight | 2.65          | 0.43               | None                | 16.43 | 1.24                   | 41.05                                      | 6.88                            | Not estim.                            | 1.98               |
| Apr. 27             | Effluent, clear         | None   | 2.28          | 0.18               | 0.017               | 13.79 | 0.82                   | 37.40                                      | None                            | None                                  | 1                  |

#### CANAL WATER CONTAMINATED WITH SEWAGE. LABORATORY EXPERIMENTS.

##### Carbon Plates.—Average of Forty Analyses.

|                        | Free Ammonia. | Albumenoid Ammonia. |
|------------------------|---------------|---------------------|
| Before treatment ..... | .073          | .037                |
| After treatment .....  | .053          | .014                |

##### Iron and Carbon Plates.—Average Result of Five Analyses of Sewage.

|                        | Free Ammonia. | Albumenoid Ammonia. |
|------------------------|---------------|---------------------|
| Before treatment ..... | .431          | .08                 |
| After treatment .....  | .431          | .08                 |

## Illustrations.

### TOMB OF LORD HENRY MARNEY, AT LAYER MARNEY CHURCH.

SOME references to this terra-cotta tomb will be found in our account of the Architectural Association's excursion on Saturday last (see p. 41).

### A CORNER OF ELY CATHEDRAL.

This illustration shows the interior of one of the small western transepts, as they may be called, though they are hardly transepts in the strict sense, which give importance to the western facade of Ely. The lower work is of transitional character, with the interesting arches which have been sometimes considered (though, we think, erroneously) to have given the suggestion of the pointed arch. The later work above is marked by the wall-arcades of trefoiled arches.

The illustration is from a drawing by Mr. Arnold B. Mitchell.

### MONUMENT TO THE LATE EARL DUDLEY.

WE gave a pretty full description of this monument in the *Builder* for June 9th of this year, page 420. We now give an illustration from a photograph. The monument is designed, both the figure and the substructure, by Mr. James Forsyth, and was executed at his studio. The figure is in white statuary marble, the decorative carving on the pedestal of alabaster, and the plinth of red granite. The monument is placed between two piers on the south side of the Lady Chapel in Worcester Cathedral.

### SKETCHES AT AND NEAR LAYER MARNEY, ESSEX.

THE porch of Feering Church, and the other sketches on the same page, are referred to in our account (on p. 41) of the recent visit of the Architectural Association to Layer Marney.

### ST. GEORGE'S HOUSE, EASTCHEAP.

This block of offices occupies some 10,000 superficial feet, and has a frontage of about 100 ft. to Eastcheap, and a frontage to George-



lane of similar extent, with two interior areas each about 30 ft. by 30 ft. The buildings comprise sub-basement, basement, and ground-floor, and five other floors over. The construction throughout is of a very massive and elaborate character. The elevation is in Portland and Beer stones. The contractors were Messrs. Perry & Co., and the architect Mr. Delisse Joseph.

#### OLD COTTAGE ARCHITECTURE. II.

WITH regard to the date of old cottages which I have ascribed to the latter part of the sixteenth century, I may cite the Statute of Elizabeth, A.D. 1589, which states its object to be "for avoiding of the great inconveniences which are found by experience to growe by the erecting and buyldinge of great numbers and multitude of Cottages which are daylie more and more increased in manye parts of this realme." The Act goes on to say that no one is to build or convert buildings into cottages without setting apart at the least four acres of ground to each. It excepts from this rule towns, mines, and factories, and cottages for seafaring folk, under-keepers and others, and also forbids the occupation of any cottage by more than one family.

An Act with some bearing on the subject is that of Henry VII., A.D. 1489, "against pulling down of towns."

This was directed against the wholesale destruction of tenements consequent on the throwing of many parts of the country into pasture, and enacted that no houses customarily let with twenty acres shall be pulled down, but on the contrary gives special directions for its repair when necessary, under the king's direction in default of the owner's. This Act was probably not much needed in this particular part of the country, but gives an idea of the class of house then existing.

The Act of Elizabeth shows not only that cottage building was going on briskly, but that, just as still happens, old buildings were being turned into cottages as they fell out of use, owing to the erection of new houses of importance.

The roofing material is generally tile, but on the borders of Suffolk, as at Alford, stone slates are commonly used, and in buildings of importance these are found further up in the country. Probably thatch was largely used before tiles, as was commonly and is still the case in Kent, and as is the case with some of the oldest cottages in Sussex.

Brick and tile making began to be general early in the sixteenth century, but very probably it was not till the time of Elizabeth that tiles were cheap enough to supplant thatch.

The Horsham, or stone slates, are possibly in some cases as originally put on. Probably it would be difficult to find an original tile roof, as owing to the decay of the laths, the tiles have in most cases been relaid.

The lath used was and is of heart of oak, which would probably be still in good condition if it had not been for the splitting of the lath by, and corrosion of, the iron nails. It is a common thing, in stripping an old roof, to find the whole of the laths detached from the rafters, and the tiling only kept in its place by its own weight. The pins were of hazel or willow, but the delight of the tiler was to get hold of an old elder stump, which was supposed to make the most durable pins of all. I have known all these woods used, though deal has generally supplanted them, and is in its turn replaced by iron.

The making of tile pins was valued by the bricklayer as a useful occupation for winter.

In speaking of the date of weather tiling in my last paper (see *Builder*, p. 10, ante), I forgot how far we were advanced in this century; it would probably be safer to give a margin of date back to the beginning of the last century, though undoubtedly by far the largest part of it has been done within the last hundred years.

Of the present illustrations, that of Alford House represents a building of some importance. The tradition is, as in many similar cases, that a second return-wing has been pulled down, but there seems no ground for this. The L shape is an ordinary one. The doorway led into a part of the hall cut off by the screen from the main hall, and the private rooms were in the return-wing.

The beams of this house are of very good workmanship, and, where the whitewash has flaked off, show the original disempe-couleur with floral patterns with which they, as well as

the doors, were covered. This was an unusually perfect example of the manner in which oak was commonly treated originally, and would well repay careful examination if it be still in the state in which I saw it some years ago.

Plunks Farm and a house on Shamley-green have similar tracery bargeboards of more elaborate character than usual, and are probably fifteenth century work.

I have drawn the old gable at Shamley-green in its proper position, but by the unfortunate neglect to jack up one corner when it was repaired, it is curiously and unpleasantly out of the level.

The view at Bramley in the inside of a cramped court, shows what was the porch of a house of some importance. The door-posts are well moulded, with characteristic Tudor stops. The "circle" frame-work is found at Tangley Manor and Gomsall close by, and is as elaborate as any in use in this part of the country.

R. N.

#### SANITARY INSTITUTE OF GREAT BRITAIN: ANNUAL MEETING.

THE anniversary meeting of the Sanitary Institute of Great Britain was held on Thursday, the 12th inst., in the theatre of the Royal Institution, Albemarle-street, Mr. Edwin Chadwick, C.B., occupying the chair. Amongst those present were Inspector-General R. Lawson, Professor T. Hayter Lewis, Mr. G. J. Symons, F.R.S., Justice H. C. Cunningham, Professor W. H. Corfield, Major Flower, Mr. Rogers Field, Dr. Danford Thomas, and other gentlemen.

The Chairman, in opening the proceedings, claimed in behalf of the Sanitary Institute and other allied institutions that good work had been achieved. He claimed for them a large proportion of the reduced death-rate of the metropolis, which had been got down now to 14 per thousand; while in places which were undistinguished by the same sort of work the death-rate remained unaffected, some of them having a death-rate double that of London. The death-rate of Paris was 27 per thousand, that of Vienna 30 per thousand, that of St. Petersburg 40 per thousand, while the death-rate of the United States was 47 per thousand. He attributed the reduction which had been achieved in the death-rate of London to sanitary work. Mr. Chadwick concluded by calling upon the chairman of the committee of judges, Mr. Rogers Field, to read the report of the judges on the award of prizes at the Bolton Exhibition.

Mr. Rogers Field accordingly read the report, from which we make the following extracts:—

"We, the undersigned, the Judges appointed by the Council, beg leave to recommend to the Council the following arrangement of Medals and Special Certificates, and of Certificates of Merit."

Exhibitors who have already received Medals at the previous Exhibition of the Institute are excluded from awards of Medals, but those Exhibitors to whom a Medal would otherwise be awarded receive Special Certificates, and these are distinguished in the following list by asterisks.

#### MEDALS AND SPECIAL CERTIFICATES.

##### Class I.—Construction and Machinery.

\*Doulton & Co., Lambeth, for Patent Fireproof Flooring.  
\*Greenall & Co., Manchester, for Steam Washer.  
Manlove, Alliott, Fryer, & Co., Nottingham, for Johnson's Dyeer.

##### Class II.—Sewerage and Water Supply.

\*Doulton & Co., Lambeth, for Self-adjusting Joint for Sewer Pipes.  
\*Heap's Dry Closet Co., Manchester, for Dry Earth Closet and Sanitary.  
International Water and Sewage Purification Co., London, for Material for Filtering Water.  
\*Morrell's Sanitary Company, Manchester, for Morrell's Colloid Sifting Ash Closet.  
\*White, W. P., & Co., London, for Nicholls's Soot and Salt Closet.

##### Class III.—Heating, Lighting, and Ventilation.

Bennis, E., Bolton, for Smoke Preventing Mechanical Stoker and Camel Furnace.  
Elliott, Edmonson, & Olney, Manchester, for Welsbach's Incandescent Gas Burner.  
\*Kirkham, J. & W., Bolton, for the Blackman Air Propeller.

Vuar, J. & T., Liverpool and London, for Mechanical Smoke Preventing Stoker and Furnace.

##### Class IV.—Personal Hygiene, Food, Filters, and Disinfectants.

Magnetic Filter Company, London, for Spencer's Magnetic Filter.  
\*Manlove, Alliott, Fryer, & Co., Nottingham, for Washington Lyon's Steam Disinfecter.

##### Class V.—Miscellaneous Articles of Sanitary Interest not included in the above Classes.

Galloway, J., Bolton, for "Lightning" Fire Extincteur.  
Haslam, J., Bolton, for "Realty" Hand Fire Extincteur.  
Lovibond, J. W., Salisbury, for Tintometer.

#### CERTIFICATES OF MERIT.

##### Class I.—Construction and Machinery.

Gregson, J., Bolton, for Removable Rain-water Pipe.  
Hindle, Norton, & Co., Oldham, for "Acme" Door-Check and Stop.  
Sanitary Dry Lime Co., Bottle, for Sanitary Dry Lime.  
Thompson, H. & Co., London, for Magnetic Oxide Paint.  
Wright & Co., London, for Fireproof Firing Blocks.

##### Class II.—Sewerage and Water Supply.

Cuerden, R., Bolton, for Morrison's Spray Lavatory.  
Cuerden, R., Bolton, for Shanks's "Imperial" Lavatory.  
Cuerden, R., Bolton, for Shanks's "Reliable" Water-waste Preventer.  
Cuerden, R., Bolton, for Shanks's "Tubal" Wash-out Closet.  
Doulton & Co., Lambeth, for Stoneware Safety Pipes, in Long Lengths.

Doulton & Co., Lambeth, for Improved Siphon Flush Tank.  
Parkinson, Sweeney, & Co., Manchester, for Air-tight Soil Pipe, with Slide Catch.

Robertshaw, J., Manchester, for Laws' Pathway Rubbish Receiver.  
Vause, J., & Son, Bolton, for Cast-iron smooth Bore Drain Pipes and Fittings.

Vause, J., & Son, Bolton, for Craig's White Enamelled Sinks.  
Vause, J., & Son, Bolton, for Rufford's Enamelled Fire-clay Bath.

Vause, J., & Son, Bolton, for Shanks's "Imperial" Lavatory.  
Vause, J., & Son, Bolton, for Shanks's "Reliable" Water-waste Preventer.

Vause, J., & Son, Bolton, for Shanks's "Tubal" Wash-out Closet.  
Vause, J., & Son, Bolton, for Shanks's Urinal with Tilting Flusher.

Vause, J., & Son, Bolton, for Shanks's Wash-out Closet and Cistern combined, for Country Use.  
White, W. P., & Co., London, for Nicholls's Soot and Salt Urinal.

##### Class III.—Heating, Lighting, and Ventilation.

Control Air Trap Company, Bolton, for Humidifier and Air Inlet.  
Elliott, Edmonson & Olney, Manchester, for "National" Air Inlet.

Hancock, F. C., Dudley, for New Cooker and Steamer.  
Hargreaves & Bardsley, Oldham, for "Eclipse" Gas Governor.

Martins and General Improvement Company, London, for Portable Gas Stove Lamp.  
Scott & Co., Manchester, for Combined Gas Governor and Cut-off Valve.

Wilson, Charles, & Son, Leeds, for Open Gas Valve.  
Wilson, Charles, & Son, Leeds, for Gas Kettle.

##### Class IV.—Personal Hygiene, Food, Filters, and Disinfectants.

Calvert, F. C., & Co., Manchester, for Soluble 70 per cent. Carbolic Acid.  
Hemby, J. C., Manchester and London, for "Through-colour" Lintolium.  
Morrell's Sanitary Company, Manchester, for Cinder-Sifting Dustpan.

Peck, J. H., & Co., Wigan, for Ambulance Stretcher for Use in Mines.  
The following, which have given awards at previous exhibitions, are now so well known, and their merits are so fully appreciated, that the judges do not think it necessary to make any further award to them: Mr. J. C. Barth-Croft, Calvert's Pure Carbolic Acid, Potts's Edinburgh Sewer Trap, Buchanan's Disconnecting Trap, Buchanan's Access Pipe, Stott's Mercury Gas Governor.

We regret that we are unable to recommend the award of the Richardson Medal.

The report is signed by Mr. Rogers Field, B.A., M.Inst.C.E. (chairman of the judges); Mr. A. Wynter Blyth, M.R.C.S.; Prof. W. H. Corfield, M.A., M.D.; Mr. W. Bassie, C.E., F.L.S., F.G.S.; Mr. Baldwin Latham, M.Inst.C.E.; Mr. Henry Law, M.Inst.C.E.; Prof. T. Hayter Lewis, F.S.A., F.R.I.B.A.; Mr. Louis Parkes, M.D.; Mr. J. Wallace Peggs, A.M.Inst. C.E.; and Mr. Ernest Turner, F.R.I.B.A.

The Chairman then distributed the awards as the names were read out, and in doing so he commented upon the very important progress which had been made by the Messrs. Doulton, their manufactures especially denoting great progress in sanitation. Some decisions had yet to be received in respect of the advance in economy of cooking by gas instead of by wild flame. He was assured that offers were now being made to manufacturers in Manchester to do the work of the steam-engine by gas at two-thirds of the price of the present wild flame. If that could be accomplished, away would go the smoke, and down would come the tall chimneys, and that would enormously facilitate the sanitation of the metropolis and other places where manufactures were carried on. At one place in America all the engines were now worked by gas instead of steam, it being found more economical.

Dr. B. W. Richardson, F.R.S., then delivered an address on "The Storage of Life as a Sanitary Study." The following is an abstract of the address:—

Dr. Richardson opened by referring to instances of long life in the lower animals and in man. These, by some peculiar process as yet but little investigated, hold life as a long possession, and to this faculty he applied the

\* These were exhibited at York, but the testing was not completed in time for the last report.

\* This was exhibited at Leicester, but the testing was not completed in time for the last report.



term "the storage of life," speaking with special regard to human life, because up to this time the sanitary question is confined chiefly to members of the human family, and because the storage of life, by aid of sanitation in that family, opens up for sanitarians a wide field for investigation and labour. The problem placed before the society was then shortly stated as follows:—Certain proofs of the power of the human body to lay or store up life to a prolonged period are admitted. What are the conditions which favour such storage, and how can we promote such conditions? The conditions were next stated, in the following order:—

(1). Hereditary qualification. (2). The virtue of continence. (3). Maintenance of balance of bodily functions. (4). Perfect temperance. (5). Purity from implanted or acquired diseases. These were then taken up *seriatim*, the influence of heredity having the first place. Many details of the effects of heredity were supplied, amongst others, that if the ages at death, from natural causes, were obtainable of the parental lives of a man or woman through three generations, the average of their ages,—the sum total of them divided by six,—might be accepted as the commercial value of the last life. To this rule there were some variations, to the effect that, taking the age of sixty as a medium point, the value of the last life was less under that point, greater above it. From this topic the lecturer passed to the study of temperaments as connected with life storage, showing that the bilious and sanguine temperaments are the best for long life, the nervous and the lymphatic the worst. In treating on the virtue of continence as an aid to long life, Dr. Richardson's argument went completely against the grosser advocacy of the Malthusian doctrine. He maintained that under a proper sanitary and healthful régime there would be no danger of, nor trouble from, over-population; that all artificial means to suppress population, even if they succeeded in respect to reduction of numbers, would lead to the development of a feeble race,—a process of bad sanitation. The work of the sanitarian, as it is now in progress, is the best calculated to insure this success without recourse to any extreme or doubtful method. In the third division of his discourse, the speaker dwelt on the sustenance of balance of the working organs of the body as a means of keeping up the storage of life. A body comparatively weak, but with all the organic structures in good balance, is calculated to live longer than a finely-made body with one even of its vital organs enfeebled or diseased. Hence the importance of proper and scientific training of both mind and body, training that should become part of the education of every child in every school in the land. The fourth topic considered brought under consideration what the author called perfected or all-round temperance,—temperance in speech, action, thought, as well as in matters of eating and drinking. We may consider that whatever quickens the action of the heart beyond its natural speed and force, is a stimulant; and, in proportion to the unnatural tax indicated by it is a reduction of the storage of life. This was illustrated from many points of view, the prime lesson advanced being that every luxurious mode of life, like every fast mode, is of a certainty a shortener of the natural term, even in those who by the advantage of belonging to a long-lived stock, are naturally fitted for good storage. All luxuries, therefore, are bad for long life; and the luxurious use of stimulants of every kind is detrimental, the alcoholic stimulants being without concealment the most injurious. The prevention of the damaging diseases formed the last subject of study. Here the art of the sanitarian comes into most effective play; and whoever in the sanitary line of research helps to remove these impediments by getting at and removing their causes, is one amongst the truest friends of humanity, and one who is assisting specially in the storage of life, which must be laid up in the first and retained in the last stage.

The Chairman.—It is my duty to move the thanks of this meeting to Dr. Richardson for the great and profound address he has submitted to us on this occasion. His address may well be studied by all sanitarians. There is only one point upon which I would immediately observe, and it is this, that our science has so far advanced that we might direct a contract for the reduction of the death-rate. I most certainly think that we might, even with the very rudimentary advances which have been made,

direct a contract for the advancement of the lives of all here by some five years or more at the least. We know what may be done by what has been done; but I may just mention what has not been done. In this metropolis, by reason of mistakes of sanitation, ignorance, and other causes, every day some thirty lives are lost in London, and some 15,000 a year in money. In the year no less than 30,000 lives are lost by bad sanitation, by the maintenance of bad conditions, and besides that there is a loss of five and a half millions sterling a year. I may contrast the loss with the gain that has accrued. We have reduced the death-rate in cities and towns by certainly more than one-half, and there has been a gain in life as well as in money. I had recently the honour to show the Crown Princess of Germany over some schools where children's diseases, such as scarlatina, measles, and other diseases, have been positively avoided, and where the death-rate of children has been reduced to one-third of the rate of the general population. I take the opportunity of moving a vote of thanks to Dr. Richardson for his profound address.

Major Flower said it was not often it fell to the lot of a man to second a proposition of thanks proposed by the father of sanitation to one who, like Dr. Richardson, had worked in the front rank of sanitary science. Not long ago a modern hero had taught them how to die: Dr. Richardson had lately taught them how to live. He seconded, with great pleasure, the vote of thanks proposed by the Chairman.

The vote was adopted with acclamation.

Dr. Richardson acknowledged the compliment, and said he had not been working so closely of late years with the Sanitary Institute, but had been connected with it from the starting, and was always glad of the opportunity of placing his services at its disposal.

Mr. G. J. Symons, F.R.S., proposed, and Mr. Rogers Field seconded, a vote of thanks to Mr. Chadwick for presiding.

The vote having been adopted,

The Chairman, in replying, referred to what had been done in India, and mentioned that the death-rate in the Indian Army had been reduced by sanitation, however imperfect, from 67 to 49 per 1,000, and a scheme was now being put forward by which it was hoped to do for the civil population what had already been done for the military population.

#### UNIVERSITY COLLEGE, LONDON:

##### CLASSES IN ARCHITECTURE.

The following prizes and certificates have been awarded:—

*Fine Art.*—Donaldson Silver Medal, E. A. Runtz of London.—Certificate, 2. Alan C. Walker of Tasmania. 3 and 2nd Prize, Harold R. Luck of London.—*Second Class.* B. F. Fletcher of London, J. W. Little of London, P. D. Smith of London.—*Third Class.* M. A. Green of Bath, E. A. Williams of Upper Norwood, F. E. Williams of London.

*Construction.*—Donaldson Silver Medal, Horace Helsdon of London. 2nd Prize, Harold R. Luck of London.—Certificates, 3. Alan C. Walker of Tasmania. 4. Wm. D. Claridge of London. 5. J. W. Little of London. 6. J. Borrowman of Godalming.—*Second Class.* A. W. Carne of St. Agnes, M. A. Green of Bath, E. C. Hanson of London, H. C. Lander of London.—*Third Class.* A. Sealy-Allen of Co. Cork, E. Finch of Roehampton, A. G. Turner of Anerley, E. A. Williams of Upper Norwood, F. E. Williams of London.

*Modern Practice.*—Prizes, equal, Gordon P. G. Hills of London, Alan C. Walker of Tasmania.—Certificates, 3, equal. Harold R. Luck of London, Oscar Cortel of London. 5. E. A. Hellicar of Bromley.—*Second Class.* E. A. Williams of Upper Norwood.—*Third Class.* M. A. Green of Bath, E. Lazareck of Aldershot, W. W. Wilson of Leytonstone.

Professor Roger Smith's prizes for drawings illustrative of the work of the classes were awarded as follows. *Fine Art Prize*, divided between E. A. Runtz and A. C. Walker. *Construction Prize*, divided between John Borrowman and H. C. Lander.

**Land at Dovercourt.**—On Wednesday next, July 25, as will be seen by our advertisement columns, Mr. F. C. Kettle will conduct a sale of building land at Dovercourt.

#### THE NATIONAL REGISTRATION OF PLUMBERS.

UNDER the presidency of the Mayor of Newcastle-on-Tyne, a largely attended public meeting was held on Monday in the Council Chamber "to consider the registration of qualified plumbers."

Deputations, in most cases consisting of the Mayor, Medical Officer of Health, and Town Clerk, attended from the Corporations of Jarrow, Gateshead, Sunderland, North and South Shields, Durham, Darlington, Stockton, the Hartlepool, Tynemouth, Middlesbrough, Whitby, Carlisle, Whitehaven, Kendal, Blyth, and other places.

Councillor Winter moved "That a District Council for Northumberland, Durham, Westmoreland, Cumberland, and North Yorks be formed to carry out the system of registration for that district, and that the Council shall consist of master and operative plumbers and the public."

Professor Garnett seconded the motion, and gave an account of the work done in technically educating plumbers; and said he was authorised by the masters and operatives of the district to express their approval of the registration system.

The motion was unanimously carried.

#### ARCHÆOLOGICAL SOCIETIES.

*Bristol and Gloucestershire Archæological Society.*—The thirteenth annual summer meeting of this Society commenced on Monday last, in Gloucester, and was continued until Thursday. We defer a more detailed notice until next week.

*Royal Archæological Institute.*—As we have already mentioned, the annual meeting of this Institute will be held this year at Leamington, commencing on Tuesday, August 7th. The President of the meeting will be Lord Leigh. The Antiquarian Section will be presided over by the Rev. J. Hirst, the Historical Section by the Rev. W. Hunt, and the Architectural Section by the Worshipful Chancellor Ferguson, F.S.A. There will be excursions by road or rail to Stratford-on-Avon, Banbury, Broughton Castle and Church, Shutford, Compton Wynates, Bloxham, Adderbury, Warwick, Guy's Cliff, Kenilworth, Stoneleigh Abbey, Baginton, Coventry, Hatton, Baddeley Clinton, Temple Balsall, Knowle, Solihull, Meriden, and Berkeswell; and, on two supplementary days, to Leicester and Melton Mowbray.

*Surrey Archæological Society.*—The annual excursion of this society was held on the 11th inst., Ockley, Capel, and Oakwood being visited, under the presidency of Major Alfred Heales, F.S.A. Owing, probably, to the threatening weather, there was a very small attendance, those present including Messrs. T. Milbourn (hon. secretary), W. F. Potter, Rutherford, F.S.A., Ralph Nevill, F.S.A. (Guildford), and others. Conveyances met the party on their arrival at Ockley Station at 12.23, and they were driven to Ockley Church, of which Mr. Ralph Nevill, F.S.A., F.R.I.B.A., gave a description. He said there was no mention of a church in Domesday, and, indeed, the mention of Ockley at all was obscure. The Rector (Rev. F. P. Du Sautoy) had given him a reference, unearthed by Mr. O. Fflahertie, of Capel, in the registers of Winchester, of the date 1336, which granted a dedication of the church, and which church was stated to be "formerly founded, destroyed, and newly and totally restored as we understand, from the foundations." It was evident that the church was built in time for re-dedication in 1336. Of this date was, doubtless, the good window on the south side, which was really almost the only piece of antiquity in the church. During the restoration, everything possible was saved, by the care of the Rector. The chancel had a brick east wall, and the porch was apparently of the sixteenth century. The tower was rather a puzzle. The tradition was that it was built to fit the bells about 1600, but it was not clear that the four arches inside were of the same date. On the whole he was inclined to think the arches were those of the original central tower of the church mentioned as destroyed in 1336, at which period the central tower was left at the west end. After allusion to the registers, which were unusually early, Mr. Nevill drew attention to what tradition held to be the site of the Castle, on the site of the present farm buildings adjoining, where could



be traced the most by the ponds and what seemed to have been a ditch, and on two sides the stream formed a natural moat. In building a wall there a few years ago the workmen came across a quantity of pottery, the fragments which were preserved being of a fine and interesting vessel of the Saxon date. If the contemplated removal of the society's museum to Guildford Castle was carried out, he hoped there would be an extra incentive to the preservation of all such interesting memorials. The company afterwards proceeded to Ockley Court Farm, and in one of the outbuildings Mr. Nevill read a paper on the site of the old castle and the battle of Ockley between the Danes and Saxons. He described the course of the old Stane-street, and alluded to the interesting remains of ancient camps around that neighbourhood, dealing more especially with Thundersfield, which the late Mr. Götwin-Auston thought might be one of the enclosures in the woods that Cæsar described as held by the ancient Britons at the time of his invasion, and they certainly answered this description. There was, however, no doubt a Roman camp on Bury Hill, Dorking, as was shown by the survival of the name "The Nower" adjoining it. The company, after luncheon, drove to Oakwood Church, where the hon. secretary, Mr. Thomas Milbourn, read an interesting paper on the structure. He mentioned that the church was erected as a chapel of ease to Wotton, Abinger, Ockley, and other parishes adjacent, and in the county of Sussex. The tradition was that the chapel was built and dedicated to St. John the Baptist by Edward De La Hale, a knight whose estate was in the neighbourhood, and who was supposed to have built Hale House, in thankfulness for his son's life being saved from a wild boar in the chase. The date of the church was about 1210 or 1220, probably the latter date, and as they had it on record that Edward De La Hale was not buried until 1430, the church was probably founded by some earlier members of his family. After going through various vicissitudes in the reign of Henry VIII. to the time of Elizabeth, he stated that in 1709 two gentlemen, Mr. Haynes and Mr. Gough, sold the three bells to raise the fund for restoration, and from this time, and especially by John Evelyn, the church had been greatly assisted by the Evelyn family. The register began in 1696, when there was a record of its plate, which was now in the possession of Mr. Evelyn at Wotton, and was of pewter. He described the very fine brass in the chancel, representing a knight in armour with coat of arms; also the interesting wall paintings discovered in 1879, when the church was restored. The Vicar, Rev. E. A. Knowles, kindly exhibited tracings of these to the company, and the Rev. E. A. Chichester (Dorking), late vicar, read an interesting old document or petition, presented to Edward VI., and again to Queen Elizabeth, praying for the opening of the church for worship, it having been closed for some time. Cape Church was afterwards visited.—(Abridged from the Surrey Advertiser).

#### "A NEW FORM OF DRAIN-PIPE."

SIR, It is very interesting to find two of our able masters in architectural design turning their attention to improving drain-pipes. It is also curious to see how the two have both hit upon the same style of "improvement." The idea of laying pipes in lower and upper halves is not new; but, setting that aside at present, the question is—Is the alteration proposed by Messrs. R. Norman Shaw and T. L. Watson really an improvement? I think not, and for the following reasons:—  
Seeing that drain-pipes now are often put to either the smoke or water test, they ought to require as little jointing as possible, and they ought also to be strong. Now this pipe, whether it be Mr. Watson's or Mr. Shaw's, being of U-shape in section, is naturally very weak, while, being open all along the top, that implies two jointing surfaces all along two sides of the top of the pipe in addition to the round joint at each 2 ft. or 3 ft., according to the lengths of the pipe. Now, as this means three times as much jointing-surface as with the ordinary pipes, and three times as much cement to be used, I do not see where the "improvement" comes in. In fact, I consider the use of such a pipe for ordinary drainage work in and about houses an absurdity. In my opinion, Mr. Watson is entirely wrong in the assertions he makes on p. 32, viz.,—1st. That the joints inside can be better finished off than with the ordinary pipe. 2nd. That the U-shaped pipe can be more accurately laid. 3rd. That the U-shaped pipe can be more satisfactorily tested than any other kind of drain-pipe. 4. That said pipe is an advance on any other in use.

An ordinary round drain-pipe could be easily jointed to stand five times the water pressure that Mr. Watson's pipe could stand. Then, again, in laying the ordinary pipe, if one of my access-pipes are put in every 20 ft. or so, the interior of the drain-pipe can be easily examined, and the drain-pipe can be easily plugged up and flushed at a moment's notice in a way impossible with Mr. Watson's pipe. Mr. Watson appears to me to write in ignorance of what is being done with the drain-pipes in the market. He could hardly be expected to know so much about a number of the practical details as one who has made a personal special study of improved drainage for the last dozen years and more.

W. P. BUCHAN.

Glasgow, July 14th, 1888.

#### BABLAKE SCHOOLS, COVENTRY.

SIR,—A notice appeared in the *Builder* of July 14 [p. 33], announcing that the trustees of the Bablake Boys' School, Coventry, had appointed Messrs. John Giles, Gough, and Trollope their architects to carry out these schools. I beg to inform you that in the open competition for these schools, these gentlemen were placed second by the assessor, Mr. J. Oldrid Scott, and the first place was awarded by my designs. The trustees, however, without any explanation, set aside the assessor's award.

REGINALD T. BLOMFIELD, M.A.,  
Architect.

#### "DRY ROT."

SIR,—Referring to the recent correspondence in your columns, it seems to me that one cause of this evil, little thought of generally, lies in the careless way in which buildings of all kinds are too often, during their construction, left open to the damp and rain to sow the seeds of the "dry rot" harvest. Often does a great rainstorm so flood a building that (on account of the pressing necessity of completing the work in a given time) no steps are taken to ensure each part being in a proper state of dryness before being covered in, and (in many instances) the air almost excluded. This is especially the case where timber rest or damp walls, setting the enemy to work at once under the most favourable circumstances for the development of the rot. How, in these days of competition, a remedy may be provided is difficult to say. Meanwhile, the fact remains.

LUX.

#### The Student's Column.

##### ARTIFICIAL STONE.—III.

##### Semi-Vitrified Stones.

THIS section includes artificial stones, in the formation of which partial vitrification has been effected, with the result generally of producing much more porous and workable products than are possible in the previous section. Common bricks, terra cotta, and similar architectural stoneware are well-known types of this class of stone, but in this article only a few special compositions will be referred to, for the all-sufficient reason that so great is the number of special brickmaking mixtures and methods that a series of articles devoted to this one branch of the subject would be necessary to satisfactorily discuss it.

The revival of the manufacture of artificial stone, or of that class of it known as terra-cotta, according to a paper read by Mr. C. Fowler before the Institute of British Architects in 1850, took place towards the end of the last century. A Miss Coope, of Lyme Regis, was the "revivalist," this lady having started about that time a pottery at Lambeth for the manufacture of an artificial stone which was used in many important works, such, for example, as the roof-screen or loft in St. George's Chapel, Windsor. The stone was generally composed of a mixture of white potter's earth, pulverised stoneware, powdered glass, and, for some finer purposes, a little Reigate sand and powdered flint was added. These ingredients were carefully mixed with water in a pug-mill to a stiff consistency, moulded, dried slowly, and burnt.

The utilisation of river mud, sand, and siltage in the making of bricks or artificial stones has been known from the earliest ages, and has been the subject of several patents in more recent times; one, for example, being that of J. White, the younger, of Whitehall Wharf, who, in 1809 (No. 3,269), employed the deposit of the Thames used either alone or mixed with sand and clay, the articles being moulded, dried, and baked in the usual way.

A very light, porous brick has also been made from a mixture of clay and peat moulded together and burnt.

E. Brady's composition, patented in 1884 (No. 16,251), intended as a substitute for stone, brick, &c., consists of clay, preferably known as fire-clay, mixed up with any vegetable pulp, such as jute, Manila, straw, grasses, &c., and a similar quantity of finely-sifted coal ashes; about 5 lb. of pulverised felspar, and about an equal quantity of caustic potash or soda dissolved in water are next added in sufficient quantity to bring the mass to a proper consistency, and it may then be suitably coloured, moulded, compressed, and finally baked in a kiln.

In an early patent (1796, pat. 2,098) a mixture of limestone, clay, and sand was strongly baked to produce very hard, rough stone.

For the production of a smoother and more ornamental though hard stone, P. Brookes, in 1825, used mixtures containing such materials as granite, felspar, clay, marl, flint, &c., finely pulverised, thoroughly mixed, and rolled between metallic rollers, and then baked to produce partial vitrification. About twenty-six years later was patented the use of elvan, a granitic rock which weathers white, largely found in Cornwall, at Dartmoor, in Ireland, and in other places. This rock was to be powdered, mixed with water, moulded into desired shapes, and baked in a similar way to earthenware. If a harder stone is required, flint, sand, or quartz is added, and the articles burnt at a higher temperature. About a year later Messrs. Way & Paine proposed to use the siliceous clay found near Farnham in Surrey, and in other localities, and which contains amorphous silica, which, being soluble in aqueous solutions of alkaline carbonates and hydrates, is termed "Soluble Silica," of which more anon. To produce a superior variety of ornamental or plain bricks or slabs suitable for lining walls, either the siliceous clay, above referred to, is used, or common clay is taken and mixed with from 15 to 30 per cent. of the soluble silica and moulded, dried, and burnt. A gentle burning will produce a material comparatively soft and capable of being sawn like wood. At this stage, if desired, the articles may be cooled and finished with tools, and then more strongly burnt until they become very hard and capable of taking a polish like granite. The patentees further point out that the greater the proportion of silica the more open is the texture of the stone, and that the moulding can only be done satisfactorily by pressure.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

10,698, Wood Veneers. F. T. Hemming.

The process which is the subject of this patent is applicable to wood mounted on metal, and consists in affixing the wood veneer on the surface of the metal to be treated with copal varnish. The veneer is applied when the varnish is "sticky" or "tacky," and the metal and wood together are passed through a rolling-machine or otherwise subjected to heavy pressure.

10,762, Terra Cotta or Firebrick Domestic Fireplaces. W. Lewis.

The fireclay backs made in accordance with this invention are constructed in sectional pieces, so as to allow the several parts to expand under the influence of heat, and to contract in the process of cooling, without risk of disintegration or cracking. The backs are also securely locked to the jambs so securely that alternate heating and cooling will not separate them one from the other. The joints are dove-tailed or joggled, and each piece fits into corresponding pieces on either side.

11,829, Locking Sash-fastener. W. Crozier.

The improvement which is the subject of this patent consists in forming lateral extensions upon the shank of the well-known knob or thumb-piece, which extensions enter a circular hole in the staple, when the bar is pulled under the latter. This extension being turned in the said hole is prevented by the comparative narrowness of the slot at which they were entered from being withdrawn from the staple until it shall have been turned back to the relative position occupied at the moment of entering.

14,990, Metallic Reversible Tread for Steps, Stairs, Pavements, &c. J. Knight.

The main object of this invention is to provide a metallic reversible stair tread, which will have a very smooth surface and great durability, and afford also a secure footing, and be non-absorbent. The steps, when worn, can be replaced without noise or hindrance to business, and, being reversible, afford two sides for wear. The slab is fitted into the tread of the stair, and retained in position by screws or other fittings. Preferably, hardened lead is used.



13,342, Improved Window Sash. R. Platt. The novelty claimed in this invention is in securing the horizontal lever ordinarily used in sash-fastenings. A T-shaped groove is made in the lever, and a corresponding T-shaped rack fits into this, and a pin passing through the catch fastens all together.

3,752, Composition for Roadways, Pavements, Building Blocks, &c. G. S. Lee.

According to this invention, slag and asphalt are used. The slag is finely pulverised, and fire-clay and talc, together with red oxide of iron or the brick-clay of commerce, also finely pulverised, are mixed. When mixed, the mass is pressed, and petroleum and turpentine added. Afterwards the blocks are subjected to great pressure, and the block heated to burn out the petroleum and spirit. It is then cooled, and is ready for use. Fireproof paint is made by utilising some of the said materials as a base.

4,947, Fireproof Partition, Ceiling, Roof, &c. T. Bailey.

According to this invention, iron sheets, with freelay or plaster, are used, or gas-piping surrounded with freelay is used, but principally dovetail, ribbed, and grooved metallic sheets, with plaster coating, are employed.

#### NEW APPLICATIONS FOR PATENTS.

July 6.—9,821, J. Peckover, Stone Saws.—9,826, I. Kirkbride, Window-fastenings.—9,832, J. Wilson, Ventilators.—9,856, B. Munster, Window Sashes and Sash-frames.

July 7.—9,878, T. Clarke and C. Crapp, Preventing cellars, rooms, yards, &c., from flooding from drains or sewers.—9,905, T. Barter and J. White, Opening and Closing Fan and Skylights, Window Sashes, &c.

July 9.—9,980, J. Cawdary, Carpenter's Mortise Gauge.—9,982, W. Cooper, Water Closet Structures.—9,998, W. Lindsay, Bridges and other structures.

July 10.—9,995, P. Rawlinson, Automatic Air-tight Joint.—10,005, J. Brown and W. Mackenzie, Nails.—10,040, C. Rogers, Wood Screws.

July 11.—10,066, C. Darrah, Ventilators.—10,078, A. Bout, Artificial Marble and Serpentine.—10,099, E. Dixon, Brick for building purposes.—10,100, G. Hixon and W. Freytmann, Safety Sash or Window Fastenings.

July 12.—10,148, F. Henninger and J. Fyfer, Sash Fasteners.—10,149, S. Tuddenham, Metal Strips for Sash Bars, &c.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

1,150, J. and F. Carr, Sash Fastener.—8,031, W. Rowbotham and W. Fox, Electrical Belts and Indicators.—8,101, M. Syer, Door Latch for Lavatories, &c.—8,173, W. Phillips and C. Tomlinson, Reheated Weather Bar.—8,186, J. Pantan, Iron Planes.—8,268, F. Wakefield and W. Worth, Mitreing Mouldings, &c.—8,334, J. Hopkinson, Fastenings and Hinges for Doors.—8,372, J. Palmer, Composition for Paints, &c.—8,515, T. Malvern, Gully Trap.—8,676, J. Goodwin, Raising Window Sashes.—8,681, W. Fisher and C. Church, Securing H. Holding Windows.—8,687, E. Newton, Ventilator.—8,723, M. Ashwin, Bricks.—8,850, G. Ginn, Cement Stay.—9,017, T. Ash and R. Peacock, Window Fastener.—9,400, G. Ulbing, Waxing Floors.—9,409, J. Saunders, Sash Fasteners.—9,484, F. Bonshard, Bath-rooms.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

12,160, A. Roberts, Bakers' Ovens.—12,264, C. Mackey and E. Bailey, Securing Knobs to Doors, &c.—12,291, W. Fraser, Automatic Door Closer and Check.—12,328, A. Melville, Fireproof Curtains for Theatres, &c.—14,229, H. Lake, Wood Paving.—7,617, J. Bardsley, Unions or Couplings for Lead Pipes.—8,011, W. Clayton, Draught-proof Reversible Window.—8,385, J. McConachy, Ventilating Apparatus.—8,443, S. Dawson and Others, Dowelling Boards, &c., together with Metal Dowels.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

###### JULY 2.

New Barnet—Seven plots of freehold land, £1,880

###### JULY 6.

By DRIVER & Co. (at Hampton).  
Hampton, Oxon.—Enclosures of freehold land, 86a. 1r. 2p. 1,420  
An enclosure of land, 1a. 8r. 9p., freehold 36  
Knapp's Farm, and 55a. 2r. 18p. freehold 1,380  
An enclosure of freehold land, 8a. 2r. 3p. 80

###### JULY 9.

By GRAVES & SON.  
Notting Hill 45 to 51 odd, 37 and 39, Lancaster-road, 74 years, ground-rent £45 1,350  
11, 13, 15, and 17, Baving-road, 74 years, ground-rent £52 615

###### JULY 10.

By F. B. FRYER & Co.  
Chiswick—2, 3, and 4, Red Lion-cottages, 10 years, ground-rent £6 175  
Kew 12 to 17, Waverley-cottages, 18 years, ground-rent £6 600

###### JULY 11.

By G. H. MARRIOTT & Co.  
City, Leadenhall-street—Ground-rent of £150, reversion 57 years 4,650

Lead-nhall-street Ground-rents of £90, reversion in 57 years £2,400  
Bermondsey—Ground-rents of £103, 5a, reversion in 61 years 2,500

By HAMPTON & SONS.

Liss, Hants—Harefold House and 6½ acres, freehold 3,500

By DUBENHAM, TWEEDY, & Co.  
St. George's-in-East—120, Backchurch-lane, freehold 350

Linehouse—1 and 3, West-crow-row, copyhold 180  
4, 6, and 8, Burn-street, 25 years, ground-rent £2, 16s. 9d. 130

2 to 10 even, Dupont-street, 25 years, ground-rent £5. 3s. 3d. 220

By MULDER, BOOKER, & Co.  
Hyde Park—7, Lancaster-gate, freehold 4,000

South Hayling—The freehold residence, Westfield and 5½a. 1r. 2p. 10,000

Queensbury Lodge, with grounds, freehold 600  
An enclosure of land, 2a. 1r. 2p., freehold 670

Burn Farm and 39a. 2r. 18p., freehold 1,460  
Eastney Farm, and 63a. 3r. 6p., freehold 1,830

By W. A. BLAKEMORE.  
Hackney—47, Frampton Park-road, and 2a, Lodge's-road, 50 years, ground-rent £2 975

Finchley—7, 8, 9, and 10, Caledonia-street, 38 years, ground-rent £28. 7s. 1,225

Camberwell—1 to 4, Westhall-road, 27 years, ground-rent £16 875

14 to 16, Westhall-road, 27 years, ground-rent £13. 4s. 600

17, Finchall-street, 73 years, ground-rent £21 210

Regent's Park—The lease and goodwill of 1, Upper Park-place, term 10 years 260

Haverstock Hill—No. 25, term 33 years, ground-rent £14 510

By H. RUTLEY.  
Edgware-road—38, Carlisle-street, 27 years, ground-rent £8. 6s. 260

80 and 81, Devonshire-street, 27 years, ground-rent £21 330

Acton—0, Stanley-road, freehold 215

81, Mill Hill-road, freehold 385

By W. H. COLLIER.  
Waterloo-road—A½ improved ground-rent of £36, term 34 years 685

By G. STOCKINGS.  
Lower Clapton—98 and 100, Gleanam-road, 31 years, ground-rent £8. 6s. 430

###### JULY 11.

By W. HALL.  
Finchley Park Ground-rent of £15, reversion in 98 years 1,100

West Hampstead—Ground-rent of £28 a year, reversion in 97 years 665

Ground-rents of £27. 10s., reversion in 98 years 670

Bromley-by-Bow—Ground-rent of £33. 12s., reversion in 72 years 635

By A. WATSON.  
Peckham—43 and 45, Lyndhurst-road, freehold 1,150

By BAXTER, PARNES, & LEPFER.  
Halstead, Kent—Freehold cottage and fruit land, 3a. 1r. 2p. 950

Freehold fruit plantation, 3a. 0r. 32p. 750

By J. McLAUREN & SON.  
Lavender Hill—East of freehold land, 1a. 0r. 12p. 3,775

Stanley House, No. 253, Lavender-hill, freehold 1,370

By SIXTON & GRIMWADE.  
Tollubury, Essex—Mell House, and 238a. 2r. 39p., freehold 4,000

Monk House, and six cottages, freehold 1,060

The Manor of Tollubury Hall, with its rights, &c. 95

By F. JOLLY & Co.  
Bow—31, Tredegar-road, freehold 520

36 to 42 even, Eastward-street, 75 years, ground-rent £14 205

24, Gale street, 80 years, ground-rent £6 205

1 and 1½, White Horse-court, freehold 1,720

Walhamston—Three plots of freehold land 163

Two plots of freehold land 200

By REYNOLDS & EASON.  
Plaistow—Freehold marsh land, 23a. 2r. 0p. 3,450

By H. C. NEWSON.  
Islington—Copenhagen-street, ground-rent of £36, reversion in 53½ years 1,905

York-road, ground-rents of £56, reversion in 53½ years 1,900

Rivers-street, ground-rents of £52, reversion in 53½ years 2,250

Sydney-street, ground-rents of £52, reversion in 53½ years 1,530

Canal-terrace, ground-rents of £27, reversion in 53½ years 800

Bath-place, ground-rents of £31, reversion in 53½ years 860

Offord-road, ground-rents of £38. 2s., reversion in 42½ years 2,230

Belith-villas, ground-rents of £121. 18s., reversion in 42½ years 3,870

Thornhill-road, ground-rents of £20, reversion in 42½ years 720

###### JULY 12.

By C. C. & T. MOORE.  
Mile End—20, Eric-street, 71 years, ground-rent £5 400

Hackney—5, Teedale-street, freehold 230

Commercial-road East Nos. 328 and 325, 9 years, ground-rent £4 230

By NEWSON & HARDING.  
Highbury—12, Hamilton-road, 68 years, ground-rent £7 315

Clapton—5, Elma-terrace, 69 years, ground-rent £9. 10s. 650

By E. SIXTON.  
Camberwell—2 to 5, Station-terrace, 76 years, ground-rent £4 1,055

Wandsworth-road—1 and 3, 1, Basleigh-street, 79 years, ground-rent £7. 4s. 215

Battersea—16, Verona-street, freehold 250

By D. WATNEY & SONS.  
Waltham—25 to 33 odd, Penrose-street, freehold 1,680

35 to 43 odd, Penrose-street, freehold 2,450

45 to 61 odd, Penrose-street, freehold 5,570

1, 2, and 4 to 9, Cottage-grove, freehold 3,000

1, 2, and 3, Bridge-place, freehold 430

Freehold stables adjoining 320

Brixton—61, Loughborough Park, 34 years, ground-rent 1s., and a plot of land in rear, freehold £1,000

Bromley—Denmark-villa, ground-rents, of £23, reversion in 72 years 780

Park-road, ground-rents of £35, reversion in 72 years 1,100

By H. C. NEWSON.  
Islington, Wynford-road—Ground-rents of £94. 15s., reversion in 56½ years 3,045

Ground-rents of £24, reversion in 30½ years 960

Ground-rents of £12, reversion in 30½ years 630

Barnsbury-road, &c., ground-rents of £60, reversion in 27 years 2,270

Edward-street, ground-rents of £20, reversion in 30½ years 640

Half Moon-crescent, ground-rents of £15, reversion in 56½ years 600

Charlotte-street, ground-rents of £21, reversion in 33 years 1,080

33 years 340

Charlotte-terrace, ground-rents of £17. 5s., reversion in 33 years 1,900

Half Moon-street, ground-rents of £33. 12s., reversion in 33 years 1,790

Ground-rents of £17, reversion in 63½ years 2,320

By FARNBROTHER, RELIS, CLARK & Co.  
Great Sumner—The Queen's Head Beerhouse and two cottages, freehold 1,350

Harington, near West Drayton—A plot of freehold land, 0a. 1r. 2p. 250

###### JULY 13.

By WEATHERALL & GREEN.  
Charing Cross-road—A plot of land, area 1,410 ft., freehold 1,400

By TOPLEY & HARDING.  
Islington—4, Richmond-road, 53 years, ground-rent £8 300

By C. A. H. WHITE.  
Stockwell—53, Tatham-road, 37 years, ground-rent £6 200

By R. REID.  
Notting Hill—10 and 12, All Saints-road, 75 years, ground-rent £22 550

Westminster—38, Great Windmill-street, freehold 1,200

By ROGERS, CHAPMAN, & THOMAS.  
Camberwell—84, Wyndham-road, freehold 700

By BAKES & SONS.  
Hornsey, Turnpike-lane Maryville, 89 years, ground-rent £5. 10s. 310

West Hampstead—65, Gascony-avenue, freehold 615

Ipswich—A plot of freehold land, 0a. 2r. 0p. 160

By H. C. NEWSON.  
Islington Caledonian-road, ground-rent of £28, reversion in 56 years 1,180

Giffard-street, ground-rent of £22, reversion in 56 years 760

Barnston-street, ground-rent of £34, reversion in 56 years 990

Lyon-street, ground-rent of £22, reversion in 56 years 850

Copenhagen-street, ground-rent of £30, reversion in 30½ years 1,385

Barnsbury-road, ground-rent of £53. 10s., reversion in 30½ years 2,165

Cloudeville-road, ground-rent of £28. 8s., reversion in 64 years 1,400

Islington-place, ground-rent of £2. 9s., reversion in 4½ years 910

Barnsbury-road, ground-rent of £24, reversion in 14 years 4,310

Denmark-grove, ground-rent of £18, reversion in 14 years 2,710

Caledonian-road, ground-rent of £28, reversion in 56 years 950

Lyon-street, ground-rent of £28, reversion in 56 years 400

#### MEETINGS.

##### SATURDAY, JULY 21.

Glasgow Architectural Association.—Visit to Bothwell and neighbourhood.

##### TUESDAY, JULY 24.

Society of Engineers.—Visit to the Barking Sewage Outfall Works. (By steamboat *Celia* from Westminster Pier at 11.30 a.m.)

##### SATURDAY, JULY 28.

Architectural Association.—Visit to Professor Herkomer's House and Schools at Bushey. (See advt. on first page.)

#### Miscellaneous.

**Technical Instruction.**—The last of a series of conferences on technical instruction was held on the 11th inst. at the Technical College in Leonard-street, Finsbury. The conference was an open one, and was held mainly for the purpose of discussing the proposals for technical instruction now before Parliament, as they affect all trades. The chair was occupied by Sir A. K. Rollit, M.P., who, in opening the proceedings, said that the two Bills before Parliament,—one of which had now been dropped,—were not of a very satisfactory character. There was a third Bill, an Irish Technical Bill. He hoped that amid all the complications of Irish government, none of them would forget their duty to Ireland in developing her resources and industries. Among the remaining speakers were Professor Thompson, and Mr. Pye of the London Trades Council, the latter of whom protested against any proposal to place manual instruction under the control of the Science and Art Department and of the School Board instead of that of skilled workmen.



**Sale of Building Land in the Isle of Thanet.**—Sir J. W. Ellis, of the firm of Messrs. Farbrother, Ellis, Clark, & Co. was engaged the whole of Wednesday afternoon at the Auction Mart in disposing of one of the largest freehold properties in Thanet, which has for some time past been submitted to competition. The property consisted of estates comprising in all 570 acres, occupying positions in and near Ramsgate, Margate, Broadstairs, and Sandwich, and including a large area of building and accommodation land, almost adjoining the Ramsgate Station on the South-Eastern Railway, and prominently situated on the main Margate road, to which it possesses a frontage of nearly three-quarters of a mile. The sale also included detached plots of from 1½ to 16 acres each, in and near Ramsgate and Broadstairs. Four large farms, 30 acres of market garden ground, and several marsh farms in the Ash and Minster levels, were likewise included in the sale. The property was submitted in thirty lots, of which ten were building land, containing about 100 acres. The first lot offered, comprising the Whitehall Farm, and containing 41 acres, was sold for 3,600l. Amongst the highest prices realised was 3,000l. for a plot of building and accommodation land on the main Margate road, containing 20 acres, and 2,900l. for an adjoining building plot containing 21 acres. A farm of 51 acres on the Margate road was sold for 3,850l., but the highest price obtained during the sale was 6,950l. for an estate of 126 acres, described as comprising Linden Farm and Newport, nearly midway between Margate and Ramsgate. The smaller lots sold, containing from two to seven acres each, realised from 250l. to 700l. Of the entire number of lots submitted nineteen were sold, realising an aggregate sum of 23,225l.

**The English Iron Trade.**—The English iron market continues to improve steadily, if slowly. Since our last review of the iron trade, a fortnight ago, there has not been any relapse worth speaking of. Some districts still seem to lag behind, but the general tone of the trade shows unmistakable signs of greater strength. Pig-iron is, on the whole, firm in price, owing to a well-sustained demand, growing shipments, and decreasing stocks. The Glasgow warrant market maintains its steadiness, although there has not been much business done during the week; and the quotations for the chief brands of Scotch makers' iron display a rising tendency, notwithstanding the immense stocks. Pig-iron in the North of England is very firm, the demand being well maintained at a season usually considered the quietest of the year, and for prompt delivery it is impossible to purchase No. 3 G.M.B. under 32s. a ton, some makers holding out for, and getting, 32s. 3d. prompt. Crude iron is also somewhat stronger in Lancashire, where, up to the present time, there has been most inclination on the part of makers to give way. Hematite iron has fluctuated in the north-west between 42s. 6d. and 43s. for mixed numbers of Bessemer during the last fortnight, and is now in very fair demand at the lower figure. Finished iron is growing more active, and prices are improving, sheets and plates especially feeling the effects of a better trade. The results of the recent quarterly meetings must be pronounced satisfactory, as specifications are coming in more freely. Tin-plates have more briskly sought after, and prices have quite recovered from their recent weakness, the price of tin having gone up. Inquiry is good also for nearly all classes of steel, notably for shipbuilding descriptions. Shipbuilders are very busy, but fresh orders do not seem to be coming in quite as fully as desired by them. Engineers have plenty of work, complaints, however, being still heard as to lowness of prices.—*Iron.*

**A Big Blast of Limestone.**—In continuation of a series of blasting operations, a big shot was fired at the limestone works of Messrs. T. Beswick & Sons, Peak Forest, near Buxton, on Wednesday afternoon. Forty feet below the surface the rock was tunneled a course of 80 ft., turning both right and left, and in a chamber at the extremity two tons of powder was placed. The fuzes were fired by Mrs. Beswick, and the explosion, watched by hundreds of people who lined the hillside, occurred in eighteen minutes. The rock lifted in the centre like a huge cone, and then fell in a broken heap almost ready for trucking. It is estimated that 50,000 tons was quarried, the experiment being every way successful.—*Duxton Chronicle.*

**Large Sale of Building Land at Bognor.** The demand for further residential accommodation at this increasingly popular seaside resort, has led to the Kent and Sussex Land Society purchasing what is known as the Linden-road Estate, situated on the north side of the town, and containing an area of upwards of fifteen acres. Several roads have been laid out on the estate; Linden-road, which runs entirely through the centre of the property, being 50 ft. in width and upwards of 1,500 ft. in length. On Monday last Messrs. Baker & Sons offered the first portion of the estate for sale, at the Assembly Rooms, Bognor, where there was a numerous attendance. The plots submitted were eighty-five in number, and had frontages to Linden-road, Station-road, West, Sturges-road, and Circus-road. Mr. Baker, in submitting the property, pointed out that the plots were situated immediately opposite the railway station, and only five minutes' walk from the sea. The frontages of the several plots, as a rule, were from 18 ft. to 20 ft. each, another depth varied from 80 ft. to 150 ft. On the sale commencing there was a very large demand for the several lots, with a keen and close competition. The whole of them found a ready sale, at prices ranging from 32l. to 56l. each; a corner hotel plot, at the junction of Linden-road and Circus-road, and close to the Assembly Rooms and railway station, being sold for 146l.; and a corner shop plot, also close to the railway station and Assembly Rooms, having frontages of 61 ft. and 84 ft. respectively, being sold for 71l. The total proceeds of the sale amounted to upwards of 3,000l.

**Sewerage Works for York.**—The Corporation of York have unanimously resolved to carry out works of sewerage and sewage disposal for the city. The City Council in 1886 entrusted Mr. James Mansergh, C.E., with the preparation of a scheme, and in February, 1887, Mr. Mansergh laid before them alternative schemes. Mr. E. G. Mawbey being appointed City Surveyor of York in June, 1887, has recently been associated with Mr. Mansergh in the consideration of this question, and the scheme now unanimously adopted is an amended one submitted by these two gentlemen, which was prepared in order to reduce as far as practicable, without sacrificing efficiency, the originally proposed expenditure. It consists principally of intercepting sewers, together with new tributary sewers for that portion of the City which has been added by the Extension and Improvement Act of 1884. The sewage will have to be pumped, and the system of disposal is intermittent chemical precipitation. The estimated cost is 93,250l. The scheme will be laid before the Local Government Board with the least possible delay. It may be mentioned here that the Corporation of the City of York have just, by a very large majority, resolved to increase the salary of the City Surveyor, Mr. E. G. Mawbey, Assoc. M. Inst. C.E., from 350l. to 500l. per annum.

**Building Land in Charing Cross-road.** Last week, at the Auction Mart, by order of the Metropolitan Board of Works, Messrs. Wetherall & Green offered for sale a plot of freehold building land, situated on the east side of Charing Cross-road, about twenty yards from its junction with Oxford-street and Tottenham Court-road. The land covers an area of about 1,410 superficial feet. There were several competitors for the property, which was sold for 1,400l., being at the rate of nearly 1l. per foot.

**Festivity.**—The employees of the firm of R. & W. Wilson & Sons, Wardour-street, Soho, bath manufacturers, &c., held their annual dinner at the Lion Hotel, Farringham, on the 7th inst. The chair was taken by one of the partners, Mr. Clarke, and the vice by another partner, Mr. Williams, Mr. Wilson, the senior partner, being unavoidably absent. Mr. Williams, the junior partner, was presented with an inscribed bronze vase, in appreciation of an association lasting over thirty-six years with the firm as workman and employer.

**The Barking Sewage Outfall Works.**—These works, which are of great magnitude and cost, were visited on Saturday last by the Association of Municipal and Sanitary Engineers and Surveyors, as elsewhere mentioned; and they are to be visited by the Society of Engineers on Tuesday next. A full description of the works will be given in our next.

**North-Eastern Sanitary Association.**—The fifth annual meeting of the North-Eastern Sanitary Inspection Association was held on Monday afternoon in the Lecture-room of the Literary and Philosophical Society, Newcastle. The Mayor (Mr. W. D. Stephens) presided. On the suggestion of the secretary (Mr. R. B. Duncan), the annual report was taken as read. The substance of the report has already been published. The Mayor said there were many reasons why a society like that should make itself public, and many reasons why it came before the public at an annual meeting like that. There could be no question,—in fact, it was admitted,—that the Association had done a large amount of good during the past few years. Those connected with the Association had given information to people about their residences, and that information had been of immense advantage to the occupants of such residences. There had, from time to time, been various outbreaks of scarlet fever and other epidemics in Newcastle; and he thought he might say, without fear of contradiction, that if the residents in those neighbourhoods affected had consulted the Association, they would have had an opportunity of having the drainage of their residences put into a proper condition, and thus their position would have been rendered more secure. He concluded by moving the adoption of the report, which, he said, was one of the most satisfactory reports that had ever been placed before them. Dr. Philipson seconded the adoption of the report. The motion was then put to the meeting, and carried unanimously. Mr. Tennant moved the re-election of the Council as at present constituted. Mr. McChery, C.E., seconded; and this motion having also been carried unanimously, the meeting ended with a vote of thanks to the Mayor.

**A New System of Glazing without Putty.**—Macleod's patent system of glazing skylights, &c., without the use of putty, possesses several advantages. There are no screw-holes or nail-holes through the outer surfaces of the bars. Condensation is provided for by a channel on either side of the bar. The cap is self-fixing, by means of a steel wire spring and underlock arrangement, which grips the glass so that it cannot slip down. The new system of glazing is being introduced by Messrs. Tregon & Co., of Jewin-street, at whose works in Brewery-road we have this week had an opportunity of seeing a full-sized specimen of the glazing subjected to water and other tests with complete success.

**New Post-office, Penzance.**—A new post-office is to be erected at Penzance, Mr. J. Wm. Trounson is the architect.

#### PRICES CURRENT OF MATERIALS.

|                                             |           | 2s. 6d. | 2s. 6d. |
|---------------------------------------------|-----------|---------|---------|
| TIMBER.                                     |           |         |         |
| Greenheart, B.G.                            | ton       | 6 10    | 7 10 0  |
| Teak, E.I.,                                 | load      | 8 0     | 12 10 0 |
| Sequoia, U.S.                               | foot cube | 0 2 3   | 0 3 0   |
| Birch, Canada,                              | load      | 2 15    | 0 4 15  |
| Fir, Danzig, &c.                            | load      | 2 0     | 4 0     |
| Oak                                         | load      | 2 0     | 4 10 0  |
| Canada                                      | load      | 4 0     | 6 10 0  |
| Pine, Canada red                            | load      | 2 10    | 3 10 0  |
| " yellow                                    | load      | 2 10    | 4 0 0   |
| Lath, Danzig                                | fathom    | 3 10    | 0 5 0   |
| St. Petersburg                              | load      | 5 0     | 8 0 0   |
| Walnut, Odessa, crown                       | load      | 2 10    | 3 0 0   |
| Doals, Finland, 2nd and 1st, std. 100       | load      | 8 0     | 9 10 0  |
| " 4th and 3rd                               | load      | 6 10    | 7 10 0  |
| Riga                                        | load      | 8 0     | 7 10 0  |
| St. Petersburg, 1st yellow                  | load      | 9 10    | 14 10 0 |
| " 2nd "                                     | load      | 8 0     | 9 0 0   |
| " white                                     | load      | 7 0     | 10 0 0  |
| Swedish                                     | load      | 7 0     | 15 10 0 |
| White Spruce                                | load      | 8 0     | 17 0 0  |
| Canada, Pine, 1st                           | load      | 14 0    | 23 0 0  |
| " 2nd "                                     | load      | 9 0     | 15 0 0  |
| " Spruce, 1st                               | load      | 8 0     | 9 10 0  |
| " 3rd and 2nd                               | load      | 6 0     | 7 10 0  |
| New Brunswick, &c.                          | load      | 6 0     | 7 5 0   |
| Baltics, all kinds                          | load      | 4 10    | 11 0 0  |
| Flooring Boards, sq. 1 in., prepared, First | load      | 0 10    | 0 13 0  |
| Second                                      | load      | 0 7     | 0 8 6   |
| Other qualities                             | load      | 0 4     | 0 6 6   |
| Cedar, Cuba,                                | foot      | 0 0 3½  | 0 0 4   |
| Honduras, &c.                               | foot      | 0 0 3½  | 0 0 3½  |
| Australian                                  | foot      | 0 0 2½  | 0 0 3½  |
| Malagasy, Cuba                              | foot      | 0 0 4½  | 0 0 5½  |
| St. Domingo, cargo average                  | load      | 0 0 4½  | 0 0 5½  |
| Mexican                                     | load      | 0 0 4   | 0 0 4½  |
| Tobacco                                     | load      | 0 0 4½  | 0 0 5½  |
| Honduras                                    | load      | 0 0 4½  | 0 0 5½  |
| Rose, Rio                                   | ton       | 8 0     | 11 0 0  |
| Ros, Turkey                                 | ton       | 8 0     | 12 0 0  |
| Walnut, Italian,                            | foot      | 0 0 4½  | 0 0 5   |
| METALS.                                     |           |         |         |
| IRON—Bar, Welsh, in London                  | ton       | 4 17    | 6 5 0   |
| " at works in Wales                         | ton       | 4 7     | 6 10 0  |
| " Staffordshire, London                     | ton       | 5 5     | 7 0 0   |
| COOPER.                                     |           |         |         |
| British, cake and ingot                     | ton       | 75      | 0 0 0 0 |
| Best selected                               | ton       | 75      | 0 0 0 0 |
| Sheets, strong                              | ton       | 85      | 0 0 0 0 |
| Chili, bars                                 | ton       | 75      | 0 0 0 0 |



| METALS (continued).         | £. | s. | d. | £. | s. | d. |
|-----------------------------|----|----|----|----|----|----|
| ELW METAL.....lb.           | 0  | 0  | 7½ | 0  | 0  | 7½ |
| YAD.....                    |    |    |    |    |    |    |
| Fig. Spanish.....ton        | 12 | 17 | 0  | 0  | 0  | 0  |
| English, common brands..... | 12 | 0  | 0  | 12 | 0  | 0  |
| Sheet, English.....         | 13 | 2  | 6  | 0  | 0  | 0  |
| WATER.....                  |    |    |    |    |    |    |
| Ordinary, special.....ton   | 16 | 7  | 6  | 16 | 10 | 0  |
| Ordinary brands.....        | 16 | 2  | 6  | 16 | 5  | 0  |
| English Lugols.....         | 92 | 0  | 0  | 0  | 0  | 0  |
| INC.....                    |    |    |    |    |    |    |
| English sheet.....ton       | 18 | 10 | 0  | 19 | 0  | 0  |

| OILS.                       | £. | s. | d. | £. | s. | d. |
|-----------------------------|----|----|----|----|----|----|
| Lined.....ton               | 18 | 0  | 0  | 18 | 2  | 6  |
| Cocoon, Cochiti.....        | 24 | 10 | 0  | 27 | 0  | 0  |
| Ceylon.....                 | 22 | 0  | 0  | 0  | 0  | 0  |
| Palm, Lagos.....            | 20 | 0  | 0  | 20 | 10 | 0  |
| Rapeseed, English pale..... | 24 | 0  | 0  | 0  | 0  | 0  |
| .....brown.....             | 22 | 10 | 0  | 0  | 0  | 0  |
| Cottonseed, refined.....    | 20 | 16 | 0  | 20 | 15 | 0  |
| Tallow and Oleine.....      | 25 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S.....       | 6  | 15 | 0  | 6  | 0  | 0  |
| .....refined.....           | 7  | 0  | 0  | 12 | 0  | 0  |
| TURPENTINE.....             |    |    |    |    |    |    |
| American, in casks.....cwt. | 1  | 6  | 9  | 0  | 0  | 0  |
| TAR.....                    |    |    |    |    |    |    |
| Stockholm.....barrel        | 0  | 15 | 9  | 0  | 0  | 0  |
| Archangel.....              | 0  | 9  | 6  | 0  | 0  | 0  |

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                 | By whom required.       | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------------|-------------------------|-----------------------------------|--------------------------|-------|
| aving Pathways.....                           | Willenden Local Board   | O. Claude Robson                  | July 24th                | ii.   |
| erbing, Metalting, and Channelling Works..... | Lewisham Board of Wks.  | Official                          | do.                      | ii.   |
| outhern Approach to Tower Bridge.....         | Bridge House Est. Com.  | J. Wolfe Barry                    | July 25th                | ii.   |
| ubercence of Bank.....                        | Com. of H. M. Works     | Official                          | July 27th                | i.    |
| arming Church.....                            | St. Michael's Church    | Official                          | do.                      | i.    |
| rick Gasholder Tank, &c.....                  | Aylham, Com.            | J. Church                         | July 28th                | ix.   |
| ew Sheel's Stores, &c.....                    | Brentford Gas Co., Lim. | S. S. S. Grimley                  | July 30th                | ix.   |
| ub Buildings.....                             | Hendon Local Board      | do.                               | do.                      | ix.   |
| arious Works.....                             | Wandsworth Bd. of Wks.  | do.                               | July 31st                | ix.   |
| own Hall and Market Hall.....                 | Birkdale Com. Co., Lim. | do.                               | do.                      | ix.   |
| aking-up Road, &c.....                        | St. Matthew's, Bethnal  | A. C. Harston                     | do.                      | ix.   |
| sparring Road.....                            | Green, Guardians        | H. A. Chers                       | August 1st               | ix.   |
| lood Fat and Sewage Purification Works.....   | I. J. J. Town Council   | Official                          | do.                      | ix.   |
| ost Office.....                               | Hammersmith Vestry      | J. P. Norrington                  | do.                      | ix.   |
| omponding W. ter Reservoir, &c.....           | Fulham Vestry           | do.                               | do.                      | ix.   |
| ew Floor & Gates, &c.....                     | Kington R.S.A.          | J. C. Mallin                      | do.                      | ix.   |
| Alterations to Workhouse.....                 | Com. of H. M. Works     | Official                          | August 3rd               | ix.   |
| ngineering Works.....                         | Chelmsford Local Board  | C. Pertwee                        | August 4th               | ix.   |
| orehouses.....                                | Grand U.S.A.            | Official                          | August 7th               | ix.   |
|                                               | Hefford Cor.            | R. Austin                         | August 8th               | ix.   |
|                                               | St. Saviour's Union     | J. Jarvis & Son                   | August 8th               | ix.   |
|                                               | Met. Asylums Board      | Official                          | Sept. 15th               | ii.   |
|                                               | War Department          | do.                               | Not stated               | ii.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.      | By whom Advertised.    | Salary.          | Applications to be in. | Page. |
|-----------------------------|------------------------|------------------|------------------------|-------|
| erk of Works.....           | Sutton Imp. Com.       | 27. 6s. per week | July 23rd              | xiv.  |
| istrict Superintendent..... | St. Marylebone Vestry  | 800l.            | July 27th              | xvi.  |
| orough Surveyor.....        | Sheffield Town Council |                  | August 6th             | xv.   |

## TENDERS.

Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.

|                                                                                                                                                                                                                                       |             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| ALDRINGTON (West Brighton).—For building voluntary schools at Aldington, for the accommodation of 218 children, for the rector and churchwardens. Messrs. W. F. Williams & Arthur Lewis, architects:—                                 |             |
| R. Humphrey & Son, Hove.....                                                                                                                                                                                                          | £1,110 0 0  |
| J. Barnes, Brighton.....                                                                                                                                                                                                              | 1,030 0 0   |
| J. Longley, Crawley (accepted).....                                                                                                                                                                                                   | 1,030 0 0   |
| W. H. Sawle, Worthing.....                                                                                                                                                                                                            | 951 0 0     |
| G. Kerridge, Aldington.....                                                                                                                                                                                                           | 930 0 0     |
| BARNET.—For constructing the May's Lane and Bell's Lane sewers, for the Barnet Local Board. Mr. W. H. Langridge, surveyor:—                                                                                                           |             |
| Smith & Allen, Reading.....                                                                                                                                                                                                           | £1,889 13 0 |
| J. Cook, Spalding.....                                                                                                                                                                                                                | 1,407 0 0   |
| H. Langridge, Croydon.....                                                                                                                                                                                                            | 1,430 0 0   |
| H. Deumore, Crouch End.....                                                                                                                                                                                                           | 1,332 0 0   |
| H. Hill, High Wycombe.....                                                                                                                                                                                                            | 1,319 8 0   |
| G. Osenton, Westham.....                                                                                                                                                                                                              | 1,299 0 0   |
| G. Pepper, St. Albans.....                                                                                                                                                                                                            | 1,287 8 0   |
| G. Bell, Tottenham.....                                                                                                                                                                                                               | 1,216 0 0   |
| (Unassigned) Colchester.....                                                                                                                                                                                                          | 1,177 0 0   |
| H. Marriott & Co., Winchmore Hill.....                                                                                                                                                                                                | 1,150 0 0   |
| J. Currow, Barnet.....                                                                                                                                                                                                                | 1,090 0 0   |
| W. Nickolls, Wood Green (accepted).....                                                                                                                                                                                               | 1,043 0 0   |
| BEDFORD.—For alterations to the Balloon Inn, Bedford. Messrs. Usher & Anthony, architects, Bedford:—                                                                                                                                  |             |
| Enlight.....                                                                                                                                                                                                                          | £578 0 0    |
| Haynes.....                                                                                                                                                                                                                           | 564 0 0     |
| Freshwater.....                                                                                                                                                                                                                       | 557 0 0     |
| Watson & Walker.....                                                                                                                                                                                                                  | 530 0 0     |
| Reider (accepted).....                                                                                                                                                                                                                | 495 0 0     |
| BLACKHEATH.—For the erection of a cottage hospital. J. J. Menden Rogers, architect:—                                                                                                                                                  |             |
| Steel.....                                                                                                                                                                                                                            | £3,079 0 0  |
| Blow.....                                                                                                                                                                                                                             | 2,724 0 0   |
| Kirk & Randall.....                                                                                                                                                                                                                   | 2,620 0 0   |
| Smith & Son.....                                                                                                                                                                                                                      | 2,575 0 0   |
| Staines & Son.....                                                                                                                                                                                                                    | 2,575 0 0   |
| Weeden.....                                                                                                                                                                                                                           | 2,555 0 0   |
| Outwater & Son.....                                                                                                                                                                                                                   | 2,474 0 0   |
| Dorcy.....                                                                                                                                                                                                                            | 2,460 0 0   |
| Greenwood.....                                                                                                                                                                                                                        | 2,439 0 0   |
| Martin, Wells, & Co.....                                                                                                                                                                                                              | 2,390 0 0   |
| Jerrard (accepted).....                                                                                                                                                                                                               | 2,387 0 0   |
| BRITTON.—For the enlargement of schools and new estate's cottage at Loughborough Park Chapel, Loughborough Junction. Messrs. W. G. Habershon & Fawcett, architects:—                                                                  |             |
| Higgs.....                                                                                                                                                                                                                            | £1,328 0 0  |
| Whitehead.....                                                                                                                                                                                                                        | 1,297 0 0   |
| Cress.....                                                                                                                                                                                                                            | 1,277 0 0   |
| Hooper.....                                                                                                                                                                                                                           | 1,234 0 0   |
| Maides & Harpe.....                                                                                                                                                                                                                   | 1,112 0 0   |
| Groon.....                                                                                                                                                                                                                            | 1,067 0 0   |
| Casler.....                                                                                                                                                                                                                           | 1,070 0 0   |
| Gregory.....                                                                                                                                                                                                                          | 1,065 0 0   |
| Gregar.....                                                                                                                                                                                                                           | 1,037 0 0   |
| BRONDESBURY.—For the erection of St. George's Presbyterian Church, Willenden-lane, Brondebury, N.W. Mr. Henry S. Tyack, architect, 6, Duke-street, Adelphi, W.C.:—                                                                    |             |
| Putman & Fotheringham.....                                                                                                                                                                                                            | £4,800 0 0  |
| J. C. Tennant, Willenden.....                                                                                                                                                                                                         | 4,300 0 0   |
| Wall Bros., Kenilworth Town.....                                                                                                                                                                                                      | 4,248 0 0   |
| J. Woodward, Finsbury.....                                                                                                                                                                                                            | 3,943 0 0   |
| R. A. Lowe, Chislehurst.....                                                                                                                                                                                                          | 3,717 0 0   |
| J. Allen & Sons, Kilburn (accepted).....                                                                                                                                                                                              | 3,465 0 0   |
| CLAPTON.—For alterations, &c., to British Asylum for Deaf and Dumb Females. Messrs. Wadmore & Baker, architects, 53, Great St. Helens, E.C. Quantities supplied:—                                                                     |             |
| C. Forrest.....                                                                                                                                                                                                                       | £284 0 0    |
| Gocall.....                                                                                                                                                                                                                           | 816 0 0     |
| Paine Bros.....                                                                                                                                                                                                                       | 791 0 0     |
| Shurmer.....                                                                                                                                                                                                                          | 765 0 0     |
| Stephen Hayworth & Sons.....                                                                                                                                                                                                          | 735 0 0     |
| Hicks.....                                                                                                                                                                                                                            | 728 0 0     |
| Kilby & Gayford.....                                                                                                                                                                                                                  | 710 0 0     |
| Godfrey & Sons.....                                                                                                                                                                                                                   | 690 0 0     |
| W. M. Dabbs, Stamford Hill, N. (accepted).....                                                                                                                                                                                        | 679 0 0     |
| DRAYTON PARLOW (near Bletchley).—For additions and alterations to Drayton Parlow Board School. Mr. Frederick Gotto, architect, Leighton Buzzard:—                                                                                     |             |
| George Green, Aylesbury.....                                                                                                                                                                                                          | £265 0 0    |
| Will in Muckleton, Leighton Buzzard.....                                                                                                                                                                                              | 158 10 0    |
| G. Heley, Stewley.....                                                                                                                                                                                                                | 167 0 0     |
| Full Bros., Leighton Buzzard.....                                                                                                                                                                                                     | 138 10 0    |
| J. Harwick, Leighton Buzzard.....                                                                                                                                                                                                     | 95 0 0      |
| EALING.—For erecting and finishing a house at Ealing. Mr. L. A. Shuffrey, architect:—                                                                                                                                                 |             |
| James Chapman, Hackney.....                                                                                                                                                                                                           | £1,445 0 0  |
| [No competition.]                                                                                                                                                                                                                     |             |
| LONDON.—For the erection of a school to provide accommodation for 1,000 children, on the site in Halford-road, Walham Green (Chelsea S.), for the School Board for London. Mr. T. J. Bailey, architect:—                              |             |
| H. L. Holloway.....                                                                                                                                                                                                                   | £16,790 0 0 |
| W. H. Loden & Son.....                                                                                                                                                                                                                | 15,449 0 0  |
| W. Oldrey & Co.....                                                                                                                                                                                                                   | 15,438 0 0  |
| J. Holloway.....                                                                                                                                                                                                                      | 15,218 0 0  |
| Stimpson & Co.....                                                                                                                                                                                                                    | 15,169 0 0  |
| W. Johnson.....                                                                                                                                                                                                                       | 15,020 0 0  |
| H. Hart, Great Dover-street, S.E. (accepted).....                                                                                                                                                                                     | 14,745 0 0  |
| * Recommended by the Works Committee for acceptance.                                                                                                                                                                                  |             |
| LONDON.—For the erection of a centre for the instruction of deaf and dumb children, on the site in Pock-street, Blackheath-road (Southwark E.), for the School Board for London. Mr. T. J. Bailey, architect:—                        |             |
| H. L. Holloway.....                                                                                                                                                                                                                   | £287 0 0    |
| J. Bullers.....                                                                                                                                                                                                                       | 721 0 0     |
| G. Parker.....                                                                                                                                                                                                                        | 691 15 0    |
| J. W. Roy.....                                                                                                                                                                                                                        | 705 0 0     |
| W. Johnson.....                                                                                                                                                                                                                       | 690 0 0     |
| T. Simpson.....                                                                                                                                                                                                                       | 665 0 0     |
| V. Beun, Hammersmith.....                                                                                                                                                                                                             | 662 0 0     |
| * Recommended by the Works Committee for acceptance.                                                                                                                                                                                  |             |
| LONDON.—For the enlargement of the Webber-row School (Southwark E.), by 200 places, for the School Board for London. Mr. T. J. Bailey, architect:—                                                                                    |             |
| T. Bendon.....                                                                                                                                                                                                                        | £2,220 0 0  |
| Atherton & Latta.....                                                                                                                                                                                                                 | 2,200 0 0   |
| H. Hart.....                                                                                                                                                                                                                          | 1,952 0 0   |
| H. L. Holloway.....                                                                                                                                                                                                                   | 1,820 0 0   |
| W. Down.....                                                                                                                                                                                                                          | 1,765 0 0   |
| G. Parker, Summer-street, Peckham.....                                                                                                                                                                                                | 1,705 0 0   |
| * Recommended by the Works Committee for acceptance.                                                                                                                                                                                  |             |
| LONDON.—For the erection of a new house for the school-keeper, on the Cranbrook-road site Bethnal Green (Hackney O.), for the School Board for London. Mr. T. J. Bailey, architect:—                                                  |             |
| G. Barker.....                                                                                                                                                                                                                        | £551 0 0    |
| F. Britton.....                                                                                                                                                                                                                       | 550 0 0     |
| J. Webb.....                                                                                                                                                                                                                          | 449 0 0     |
| E. Lake, Park-place, Hackney.....                                                                                                                                                                                                     | 440 0 0     |
| * Recommended by the Works Committee for acceptance.                                                                                                                                                                                  |             |
| LONDON.—For the erection of a cookery-centre, on the Raynold-street site (West Lambeth BG.), for the School Board for London. Mr. T. J. Bailey, architect:—                                                                           |             |
| T. Henderson.....                                                                                                                                                                                                                     | £484 12 6   |
| G. Small.....                                                                                                                                                                                                                         | 468 0 0     |
| T. Linfield.....                                                                                                                                                                                                                      | 467 0 0     |
| W. Johnson.....                                                                                                                                                                                                                       | 470 0 0     |
| G. Howard, Victoria-road, Battersea.....                                                                                                                                                                                              | 416 10 0    |
| * Recommended by the Works Committee for acceptance.                                                                                                                                                                                  |             |
| LONDON.—The Works Committee of the School Board for London recommend that, subject to the usual conditions of tendering being complied with, in each case, the following tenders for warming the undermentioned schools be accepted:— |             |
| (a) Finsbury (U).—Baltic-street: Tender of Mr. J. Jeffreys, of No. 10, Great Queen-street, Westminster, S.W., amounting to £275 (exclusive of cutting away, &c.), for warming the school on the low-pressure hot-water system.        |             |
| (b) East Lambeth (S).—Summer-road: Tender of Messrs. Bennett Bros., of Nos. 2 to 10, Lime-street, Liverpool, amounting to £180, for warming the Pupil Teachers' School on the high-pressure hot-water system.                         |             |
| (c) West Lambeth (V).—Hackford-road: Tender of Messrs. J. L. Bacon & Co., of No. 34, Upper Gloucester-place, N.W., amounting to £223, 10s., for warming the Pupil Teachers' School on the high-pressure hot-water system.             |             |
| LONDON.—For hot-water apparatus, for Amies-street School, Battersea, for the School Board for London. Mr. T. J. Bailey, architect:—                                                                                                   |             |
| School, Pupil Teachers' School.                                                                                                                                                                                                       |             |
| London Engineering Co. ... £1,150 1                                                                                                                                                                                                   | £290 1      |
| Korting.....                                                                                                                                                                                                                          | 430         |
| Rosser & Russell.....                                                                                                                                                                                                                 | 412         |
| Helm, Vienna.....                                                                                                                                                                                                                     | 321         |
| Crane.....                                                                                                                                                                                                                            | 300         |
| Boyd.....                                                                                                                                                                                                                             | 275         |
| Bentham & Sons.....                                                                                                                                                                                                                   | 255         |
| J. & F. May.....                                                                                                                                                                                                                      | 255         |
| Canon.....                                                                                                                                                                                                                            | 220         |
| Phipson.....                                                                                                                                                                                                                          | 220         |
| Attwood (accepted).....                                                                                                                                                                                                               | 261         |
| LONDON.—For pulling down and rebuilding No. 463, Hackney road, and for sundry work to 449, 451, 157, and 459, Hackney road, for Mr. H. W. Lee, Mr. George Chuter, architect:—                                                         |             |
| F. & P. J. Wood.....                                                                                                                                                                                                                  | £1,488 0 0  |
| Langton.....                                                                                                                                                                                                                          | 1,324 10 0  |
| Winkley.....                                                                                                                                                                                                                          | 1,302 0 0   |
| G. W. Beale.....                                                                                                                                                                                                                      | 1,235 0 0   |
| Westcott, Lee, & Martin.....                                                                                                                                                                                                          | 1,223 0 0   |
| Thomson & Son, Hackney-road.....                                                                                                                                                                                                      | 1,199 0 0   |
| * Accepted.                                                                                                                                                                                                                           |             |
| LONDON.—For sundry repairs, &c., at 7, Gloucester-terrace, Hyde Park. Mr. S. C. Capes, architect, 18, Doughty-street, London, W.C.:—                                                                                                  |             |
| W. B. Hand & Son.....                                                                                                                                                                                                                 | £299 10 0   |
| J. H. St. John.....                                                                                                                                                                                                                   | 245 0 0     |
| Langridge & Sons.....                                                                                                                                                                                                                 | 191 15 0    |
| LONDON.—For the erection of three dwelling-houses, and workshops in rear, in Hanbury-street, Spitalfields, for Mr. W. Raydon. Messrs. Hobden & La Riviere, architects, 14, Devonshire-street, E.C.:—                                  |             |
| Consell Bros., Bethnal Green.....                                                                                                                                                                                                     | £1,560 0 0  |
| George Lusk, Mile End.....                                                                                                                                                                                                            | 1,545 0 0   |
| Allard, Pentonville.....                                                                                                                                                                                                              | 1,525 0 0   |
| LONDON.—For rebuilding Garden House, Mildmay Park, for Mr. J. E. Mathieson. Mr. R. H. Hill, architect:—                                                                                                                               |             |
| Higgs & Hill.....                                                                                                                                                                                                                     | £3,555      |
| Brass & Son.....                                                                                                                                                                                                                      | 3,345       |
| B. E. Nightingale.....                                                                                                                                                                                                                | 3,320       |
| O. Craske.....                                                                                                                                                                                                                        | 3,261       |
| Lawrence & Son.....                                                                                                                                                                                                                   | 3,212       |
| H. L. Holloway.....                                                                                                                                                                                                                   | 3,190       |
| J. T. Chappell.....                                                                                                                                                                                                                   | 3,183       |
| J. Morter.....                                                                                                                                                                                                                        | 3,161       |
| * Reduction for yellow deal.                                                                                                                                                                                                          |             |
| + Difference per rod for solid walls.                                                                                                                                                                                                 |             |
| LONDON.—For shop fronts and fittings to Nos. 134, 138, 142, 150, and 158, Ossulton-street, Easton-road, for the Ossulton Estate. Mr. E. G. Salter, architect, 166, Ossulton-street, N.W.:—                                            |             |
| W. Salter.....                                                                                                                                                                                                                        | £297 0 0    |
| Clark, Bunnett, & Co.....                                                                                                                                                                                                             | 289 5 0     |
| F. Sage & Co.....                                                                                                                                                                                                                     | 271 0 0     |
| Drew & Cadman (accepted).....                                                                                                                                                                                                         | 234 0 0     |
| NEW BARNET.—For the erection of business premises, East Barnet-road, New Barnet, for Mr. A. Cooper. Mr. Frederic W. Fryer, architect, 2, Fancras-lane, Queen-street, E.C. Quantities not supplied:—                                   |             |
| Baughen.....                                                                                                                                                                                                                          | £230 0 0    |
| Dixon, New Barnet (accepted).....                                                                                                                                                                                                     | 827 2 6     |
| [Architect's estimate, £290.]                                                                                                                                                                                                         |             |
| NEWBURY.—For additions at Stargrove, Newbury, the residence of Sir F. W. Gaden, Bart. Mr. P. Wilkinson, architect, 17, Lincoln's Inn-fields:—                                                                                         |             |
| C. Elliott.....                                                                                                                                                                                                                       | £1,309 0 0  |
| E. James.....                                                                                                                                                                                                                         | 1,259 0 0   |
| E. A. Bance, Newbury (accepted).....                                                                                                                                                                                                  | 1,218 0 0   |

**PORTMADOC.**—For the erection of a vicarage, for the Rev. D. Lloyd Jones. Mr. Thomas Roberts, architect, Portmadoc:—

|                                     |            |
|-------------------------------------|------------|
| Jones, Greenall .....               | £1,180 0 0 |
| Williams, Portmadoc .....           | 578 0 0    |
| Lloyd, Portmadoc .....              | 850 0 0    |
| Hughes, Portmadoc .....             | 940 0 0    |
| Jones, Criccieth and Barmouth ..... | 928 0 0    |
| [Architect's estimate, 2933, 13s.]  |            |
| * Accepted.                         |            |

**SOUTHWARK.**—For alterations and additions to factory, Prince-street, Un-on-street, S.E., for Messrs. Hayward Bros. & Co. Messrs. Henry Jarvis & Sons, architects. (Corrected list, in lieu of that appearing on p. 36 of last week's Builder):—

|                                  |            |
|----------------------------------|------------|
| W. Johnson .....                 | £2,100 0 0 |
| Colls & Sons .....               | 2,016 0 0  |
| H. L. Holloway .....             | 1,940 0 0  |
| B. E. Nightingale .....          | 1,893 0 0  |
| W. Downs .....                   | 1,887 0 0  |
| Holliday & Greenwood .....       | 1,685 0 0  |
| J. Holloway .....                | 1,878 0 0  |
| Lawrence & Sons (accepted) ..... | 1,821 0 0  |

**SURBITON.**—For building two houses at Surbiton. Mr. G. Sherrin, architect:—

|                           |            |
|---------------------------|------------|
| Jarvis .....              | £3,128 0 0 |
| Atkins .....              | 3,108 0 0  |
| J. Chapman, Hackney ..... | 2,868 0 0  |
| Turtle & Appleton .....   | 2,805 0 0  |

**UPTON.**—For three pairs of semi-detached cottages at Upton. Mr. J. S. Woodward, architect:—

|                   |            |
|-------------------|------------|
| Grid .....        | £1,688 0 0 |
| Whitehead .....   | 1,670 0 0  |
| Ford & Sons ..... | 1,544 0 0  |
| Nightingale ..... | 1,537 0 0  |
| Nystrand .....    | 1,475 0 0  |
| Hooper .....      | 1,128 0 0  |

**WIMBLEDON.**—For building two houses at Wimbledon. Mr. G. Sherrin, architect:—

|                                         |            |
|-----------------------------------------|------------|
| James Chapman, Hackney (accepted) ..... | £2,808 0 0 |
|-----------------------------------------|------------|

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# The Builder.

Vol. LV. No. 2373.

SATURDAY, JULY 25, 1888.

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### "What is the Use of an Assessor?"



HE above question seems, from correspondence we have recently had, to be ranking a good deal in the minds of members of the architectural profession at present. The particular kind of assessor referred to is, of

course, the professional adviser who is now frequently asked to "advise," "assist," or "adjudicate" in regard to the award of premiums in architectural competitions. The increasing number of cases of late in which it has become known that the committee or promoters of a competition, having engaged a professional assessor, threw over his award and gave the premium to another competitor, certainly give considerable point to the question, though the matter is not by any means so simple a one as some architects appear to think.

The appointment of a professional adviser to competition committees has become tolerably general of late, in consequence of the action taken a few years since by a considerable number of the profession in signing a mutual agreement not to enter into any competition unless a professional adviser was appointed. This signed understanding, which we believe has been loyally acted upon by most of the signatories thereto, has had a practical result beyond what was expected in leading or compelling competition committees to appoint professional advisers. In a number of cases, after a competition is advertised, the committee receive letters from various architects, stating that they would be happy to compete, but that they are under an undertaking not to do so unless an assessor is appointed; and the committee, even if they are inclined to be recusant in the matter, probably find practically that they can hardly have a competition worth having unless they accede to the demands of the architects. It may be observed that expostulations and recommendations in the same direction were long tried on committees, with no avail. In the *Builder* for April 13th, 1884, we printed the "Suggestions for the Conduct of Architectural Competitions," drawn up and formally approved by the Institute of Architects, and which were to a great extent directed to this question of the

advisability of appointing a professional assessor; and copies of these Suggestions were, we believe, officially forwarded in many cases to committees engaged in the promotion of competitions. But little or no effect was produced until a number of the architects "struck" for an assessor. Then the public gave in, and since then it is not uncommon to see in the advertisements inviting competitions the statement that "a professional assessor will be appointed to assist the committee in coming to a decision;" and in some cases this has no doubt been a *bona-fide* announcement, which has been acted upon in good faith, and the selection has been made in accordance with the assessor's judgment. But less scrupulous committees have lately discovered that though they may be obliged to appoint an assessor in order to satisfy the prejudices of architects, they are not obliged to act upon his award. Accordingly they engage the assessor, hear his judgment, and then set it on one side in favour of the design they like best, or of the candidate they are determined to favour; and then, say the competing architects, how are we any better off than before? And "what is the use of the assessor?"

The idea with those who make this complaint appears to be that the assessor should simply make the award, and the committee accept his judgment as final. That opinion has been distinctly expressed in letters that have been written to us, and some architects appear to think that for the committee to act otherwise is a breach of good faith. Now, we are desirous to consider the subject not from a one-sided view, as the mere advocates of the architects, but as impartial arbitrators between the architects and the public. And from this point of view we must say that, if the architectural profession expect, as some of them evidently do (we do not by any means believe that they all share this view), that all committees promoting competitions are to give up their own ideas and preferences entirely, and put themselves blindfold into the hands of a professional adviser to choose a design for them, they are expecting more than is reasonable, more than the public will grant, and more than their own leading official body has ever thought of asking for. The "Suggestions" of the Institute, before referred to, though including in the first instance the rather ambiguous phrase that the decisions of the assessor or assessors "should govern the selection of the designs in all

stages of the competition," obviously were not intended to enforce the principle that the assessor should override the committee entirely; for in the sub-clauses further defining the duties of the assessor we read, "to advise the promoters on the relative merits of the designs submitted in competition;" a phraseology which obviously leaves it open to the promoters to adopt their own course if they think proper. The undertaking entered into by the architects who, a year or so later, signed an agreement not to enter into competitions unless an assessor were appointed, ran thus,—"*unless one or more professional assessors of established reputation are appointed to advise the promoters on the relative merit of the designs submitted in competition;*" and this wording also is elastic, and does not propose anything more than advice. If it was the desire of the architectural profession that in all competitions the decision should be taken out of the hands of a non-professional committee, and put into the hands of a professional assessor, they should have so worded the undertaking which was signed by so many of the profession. They might then have obtained those conditions; but they would not have obtained them without a good deal of opposition on the part of the public, and probably some opposition on the part of members of their own body. Some of the latter would say, and have said, that on the whole they would rather trust to the average judgment of a committee representing various opinions, and in which various sides of the question would be discussed, than to that of one man, though a man of professional knowledge, who might have his own prejudices and fancies very strongly developed; we have even heard it urged that favouritism and partiality would be less likely to have free play in a Committee than if the decision was left to one man without appeal. On the other hand, the public would object, and with considerable show of reason, that the people who wanted a building, and were going to pay for it, had a right to the final exercise of their own taste and opinion, however much of good advice they might be ready to listen to; and it would be very difficult to persuade the public generally that this was not a reasonable and natural position to assume.

As to the objection from the architectural side to the absolute rule of the assessor (an objection only made, we imagine, by a very small minority of the profession), we do not think there is any-



ground for the idea that the professional assessor is likely to be more prone to personal partialities than the Committee. As far as we have been able to form any idea, we should say that the duty of professional assessor in competitions, since it has become common to appoint such an assessor, has been in general performed with most praiseworthy and judicial impartiality. We can only recall one case of importance in which any suggestion to the contrary was made by the competitors. In regard to architectural style, indeed, a single architect acting as assessor probably will have his favourite ideas about style, but we do not know that he is likely to differ from most non-professional committee-men in this, except that he will have a reason to give for his opinion, and the committee-man probably will not. And we can recall more than one case in which an assessor has decided in obvious opposition to his known tastes in regard to style, from the conviction that plan ought to be first considered, and that the best plan was obvious. On the whole, we believe that final and despotic power given to the professional assessor would afford no just cause of complaint to competitors; indeed, it is what the majority of them seem to wish for. But would it be altogether fair to the promoters of competitions? For they too, it must be remembered, have their rights, and they may say "The professional assessor may tell us that such a design is the best of the set, but it is we who are going to pay for the building and to use it; even a professional assessor is not infallible; he may be mistaken, or, if he is not, we may like another design better, and why are we not to purchase what we like with our own money?" To the public mind the argument becomes stronger when it is remembered that they have to fee the assessor, and one committee, we remember, put the case plainly in so many words—"When we have made up our own minds, why should we pay another man for his opinion?"

The answer to this lies in the peculiar position in which competing architects are placed. They are invited to exhibit their talents in designing and planning a building for certain specified requirements, on the tacit understanding that the best man wins. If the prizes in competitions are in a large number of cases given to designs which are not the best, the really able man who has produced a better design feels that his time and talents have been unfairly wasted; he ought on his merits to have won, and instead of the competition affording him a chance of getting the reward of his abilities, he is worse off than if the promoters had gone to the inferior man at once; he has spent his strength for nought, and his labour for that which is not bread. The only rational defence of the competition system is that it is supposed to be a means of getting the best building, and that it affords an opportunity to unknown men of ability to make themselves known. Now, the position of the architects is that, granting the honest intention of the promoters, they, in most cases, are not good judges of architectural design or of plan as exhibited in drawings, and that it is desirable, in fairness to all parties, that their judgment should be assisted by that of someone accustomed to the study of style and plan as exhibited in drawings. There can be no doubt that in most cases it is to the interest of the promoters themselves to be thus professionally advised; and we believe it will be found that most competition committees who have been honestly desirous of getting the best result have practically admitted this, and that while feeling free to select another design at their pleasure, they have usually elected to abide by the recommendation of their assessor, as the safest course.

In the case, therefore, of honest committees, we may say that the system by which the assessor is engaged as an adviser merely has worked, and does work, satisfactorily in the interest of the architects. But what are we to say of the case of dishonest committees, who nominally engage an assessor to satisfy the requirements of the architects, and then throw over his decision and select

an inferior man from motives of favouritism? Some of our correspondents argue, from such cases, that an assessor without despotic power is a mere sham. The fact is, however, that where the promoters of a competition are not honest in intention they will contrive to evade any conditions, and we do not believe the profession would be wise to endeavour to take away all power of choice from the promoters of competitions, and put it unreservedly in the hands of the assessor, because some committees refuse to act on his advice. They would encounter much public opposition, not all of it unreasonable, and would perhaps not attain the desired end after all. It may be desirable in special cases to endeavour to extract from a committee an undertaking to abide by the decision of the assessor; but in the main the case is better provided for in the "Suggestions" of the Institute, which recommend that the plans should be exhibited, and that the decision or report of the assessor should be published. If this were done in any case in which the committee had reversed the decision of the assessor, public opinion would be brought to bear upon any unfair dealing, and committees who were disposed to favouritism would soon learn that it was not advisable to fly in the face of public opinion; and as the assessor has his own report in his own power, it is possible for him to see to its publication, even if the committee do not do their duty in this respect.

Those who ask, "What is the use of an assessor?" merely because his decision is not absolute or binding, forget also that a very important portion of the duty of an assessor, as contemplated in the Institute "Suggestions," is to assist in preparing the conditions and instructions to competitors. This is a very important matter to the profession, quite independently of the decision on the designs, as in many cases instructions drawn up without professional assistance are loosely worded and consequently not properly intelligible, or they do not give all the information required, or they make requirements as to scale and number of drawings which are quite unnecessary and unfair to the competitors. It is unfortunate that in too many cases the advisability of appointing an assessor at all is not brought home to the promoters until after the instructions are drawn out and the competition advertised; but where the appointment of the assessor to draw up the instructions can be secured, his services in this capacity may be very important indeed, and save the competitors much inconvenience and waste of labour, inflicted on them often by committees in pure ignorance of the conditions and requirements of architectural work.

It is, therefore, we think, a mistake for architects to cry out: "What is the use of an assessor?" merely because adjudication of the assessor cannot be, or has not been hitherto in most cases, made obligatory upon the promoters of a competition. In the majority of the more important competitions in which a professional assessor has been appointed, his judgment has been accepted by the promoters; and even where it has not been finally accepted, it is probable that the committee have known more about the matter through his assistance, and perhaps made a better choice than they would have made without it, supposing them to have had honest intentions. When a committee has not honest intentions, and gives a manifestly wrong award through favouritism or private interest, the publication of the assessor's report, which ought to be made a condition of the competition, would be an influence that would soon avail to bring committees to reason, more especially in the case of competitions for public buildings to be provided out of public funds. In such a case the committee are manifestly bound to procure the best building they can, and fail in a public duty if they do not aim at this. A private committee for building a church or a bank may have more colour for urging that they have a right to consult their own tastes and not those of the assessor, though even here the question of justice to the competing

architects must by no means be forgotten; but when a corporation or a vestry conducting a competition are told distinctly by a competent man that such a plan is decidedly the best, and throw it over in favour of an inferior one by somebody whose interests they wish to promote, they are playing false with a public trust, and if the assessor's report and his reasons for his choice were published, so as to place the whole job in the light of day, the ratepayers would soon make things unpleasant for the jobbers; and that is the reason why, in such cases, there is usually such a determined objection to publishing the assessor's report.

The actual adjudication and award of the premiums by the professional assessor is, however, a possible solution of the question, though, as we have said, it is one the general adoption of which would probably be opposed by the public. Some of our correspondents, who have assumed that it was the manifest duty of committees to accept the assessor's adjudication, have probably been misled by the fact that in several prominent and important competitions of late years the promoters have accepted the assessor's award without question, because they thought it the wisest thing to do, not because they were pledged to it. In the case of the Birmingham Law Courts the Corporation adopted Mr. Waterhouse's award, but clearly without thinking themselves pledged to do so, as the question of adopting it was the subject of some little discussion. In other cases similar awards have been adopted without any discussion, but equally as a matter of choice, not of necessity. But as there is at present some uncertainty and difference of opinion as to what are the powers of an assessor in a competition, whoever is asked to undertake that responsible office ought first to obtain a precise statement in writing from the promoters as to what they are asking him to do. There are three ways in which he may act for them. (1) He may award the premiums absolutely, as their representative. (2) He may select the designs which he considers most deserving of the premiums, giving his reasons for the selection, but leaving it to the promoters to adopt his recommendation or not. This is the course most usually followed. Or (3) he may assist their judgment by a general review of the good and bad points of the plans, and leave them to form their own judgment with the assistance of the light thrown on the matter by his professional criticism; and where the promoters are men of sense and mean honestly, it may be that this is the fairest way of all, as the promoters then get the general insight given by the professional assessor's report, without leaving to his single judgment the absolute selection of any special design. But the promoters ought to furnish the assessor with a distinct statement as to which of these courses they intend to pursue, and if it be the first, they ought to give a distinct undertaking to abide by his award; and they ought, with equal distinctness, to inform the competitors whether they intend the assessor to make the award, or whether they reserve the right of making it themselves with the assistance of his information and criticism. Then competitors will know how they stand, and will have no right to make complaints afterwards.

There is one more duty that must be mentioned in regard to competitions—a duty incumbent upon the architects—viz., that they should accept loyally the award when there is no reason to suppose it has been made in any but a fair spirit. We regret to be obliged to think that there is in the profession a great want of the spirit of loyalty and chivalry in these matters. In the smaller competitions we should say that in two cases out of three no sooner is the decision announced than some of the competitors get up a movement to endeavour to upset it, and this even in cases where there has been no manifest or obvious bad faith; and, unfortunately, this kind of spirit is not confined to smaller competitions and to the rank and file of the profession. We see cases where eminent men are concerned, where an assessor whose ability and good



faith no one could question has been appointed, and where attempts have been immediately made to upset his award, on no pretence that it was corruptly given, but simply because the unsuccessful men would not rest satisfied. That is not the way to maintain the dignity of the profession in the eyes of the public. To demand the appointment of a professional assessor, and then to try to get his judgment set aside when it is against yourself, is a line of conduct which might be most properly described in the dictum of the fashionable woman in *Punch*—"It is worse than wicked; it is vulgar."

#### RIVER IMPROVEMENTS IN IRELAND.

**T**HE four gentlemen who were appointed in 1886 a Royal Commission to report upon what public works in Ireland would be desirable and practicable, are now proposed to be constituted a Commission to carry out what they recommended in 1887, that is, works of arterial drainage within the watershed areas or the catchment areas of the rivers Bann and Barrow. They are to define the catchment area of each of these two rivers; to draw up a scheme for the election of a Conservancy Board in each area, and to lay before each Conservancy Board, when constituted, the plans of the works, and the particulars of the lands which will be specially benefitted,—for the general plan is to divide these from all other lands,—also an estimate of the amount of contribution by the occupiers of those lands, and by the baronies and town lands, which the Commission are of opinion ought to contribute as being within the catchment area of the river; and generally to put the Conservancy Board in possession of the information requisite to enable them to decide whether the works are to be undertaken. The Conservancy Board will consist of persons nominated by the Board of Guardians within the catchment area, of persons elected by the occupiers of lands which will be specially charged, and of persons representing the towns within the same area,—those which have Town Commissioners,—together with one representative of Government, who is to be a member of the Board, but is not to have a vote. The persons elected by the occupiers of lands specially charged are to constitute three-fourths of the Board. This Conservancy Board may reject the scheme proposed by the Commission; if so, another Conservancy Board is to be elected; if the new Board also rejects the scheme it is to be given up; but if the Conservancy Board, representing the several interests mentioned, are in favour of the works being proceeded with, the Commission may execute them. The money is to be supplied from time to time by the Government, partly by way of loan, repayable in instalments with interest, extending over forty years, and partly as a free grant from moneys voted by Parliament.

In the case of the Shannon drainage, the recommendations of the Royal Commission of 1886 are to be carried out by the existing Commissioners of Public Works in Ireland, but it is proposed that the works shall not be undertaken unless with the assent of the occupiers of the lands specially benefitted, who will be charged according to the value of the benefit received; and of the occupiers of the rest of the lands in the catchment area, who will be charged according to the grand jury cess. The voting power of the benefitted area is to be estimated as equivalent to three times the voting power of the rest of the catchment area, and each fraction of the voting power of the benefitted area is to be in like manner equivalent to three times the same fraction of the voting power of the rest of the catchment area.

Of the comparative areas to be dealt with by the three Bills in Parliament, that of the Shannon is between two and three million acres—nearly three—above the tideway of the river near Limerick. The chief features of this basin are the large area of flat land in its middle portion, and its rapid descent in the lower portion. In the fifteen miles from

Limerick to Killaloe the rise is 97 ft. In the 125 miles from Killaloe to the uppermost lake, Lough Allen, it is 46 ft., and this is nearly uniformly distributed, being at the rate of only 4 in. or 5 in. per mile—much the longest river in the kingdom with so little fall.

In the year 1831, when the Commissioners of Public Works in Ireland were first constituted, a special Commission was appointed by Government for the improvement of the Shannon, in respect of both navigation and drainage, of which Mr. T. Rhodes was the engineer member. A complete scheme for dealing with the river was designed by Mr. Rhodes and his colleagues, the execution of which was undertaken in 1839, and consisted of deepening the channel, rebuilding bridges, removing obstructive mills and eel-weirs, and reconstructing and enlarging the locks in the middle portion of the river, with the result of providing a greatly-improved waterway through the most important parts of its course, and of improving the drainage of 34,700 acres of land, 18,200 of which were altogether relieved from floods, the duration of floods over the rest of the area being much diminished. The Irish Board of Works assumed charge of these works in 1846, nominally, but not actually until 1852, when the Shannon Commission ceased to make separate reports. In 1861 a flood of unusual magnitude led to complaints by the riparian proprietors, and the Government directed Mr. Bateman, C.E., to examine the river, and report as to the works necessary for relieving the lands from the effect of a flood equal to that of 1861, without injury to the navigation. Having examined the river, Mr. Bateman reported in 1863, and again in 1867, under further instructions, and furnished complete working drawings and estimates of all the works required. Sluices were to be constructed in the solid weirs built by the Shannon Commissioners, and improvements and enlargements of the channel were to be made in many places, and Lough Allen was to be utilised as an impounding reservoir; but the Parliamentary powers for carrying out the scheme lapsed before anything was done. In 1879-80, however, the question was again mooted, and it was decided to carry out part of Mr. Bateman's design, to the extent of inserting sluices in the existing weirs, and the formation of a new channel in one part of the river, these works being carried out in 1880-82. This partial application of the design, however, seems to have had but a limited success, and Mr. Manning, the engineer to the Board of Works, said from the first that that would be so, and that such works could not result in complete control of the floods, which could only be accomplished by excavations in certain portions of the river bed. According to the evidence of Mr. Bateman before the Royal Commission last year respecting his instructions in 1863 and 1867, his object in proposing to excavate the river bed was to get rid of the flood waters without injuring the navigation. The enlargement of the river which was necessary for the purpose of carrying off the flood waters enlarged by so much the capacity of the river for navigation. With regard to the partial carrying out of a design, the evidence is to the effect that it may do more harm than good, because it tempts people to till the ground and cultivate crops which could not previously be cultivated, and when a flood does arise the state of things is worse than before.

Draining, as it does, so large a portion of Ireland, and being the outlet of several other important rivers, the Shannon occupies an exceptional position, and the Royal Commission, on whose report the three Bills recently introduced in the House of Commons by the Irish Chief Secretary are founded, advised that in the case of this river no new Conservancy Board need be appointed, as in the case of the other two rivers, but that it remain in the care of the Commissioners of Public Works, who should, while maintaining the navigation, regulate the depth of water with a view primarily to the drainage of the country. Above Athlone, however, it

is proposed that the navigation be abandoned. The recommendations of the Royal Commission had reference to the main river only, in the case of the Shannon, the conservancy of the larger tributaries being constituted separately; but in the Bill no distinction is made. The estimated cost of the works authorised by the Bill within the catchment area of the River Shannon is 230,000*l.*, of which it is estimated that 35,000*l.* can be charged upon the lands specially benefitted, in the form of an annual charge of 4*l.* 10*s.* for every 100*l.* advanced by Government, payable for a term of forty years. This charge for capital expenditure is estimated at 1,575*l.* per annum, and will begin to be payable when the whole of the advances have been made. The maintenance charges upon the specially-benefitted lands will be about 1,575*l.* per annum, making in all a charge of 3,150*l.*

It is proposed to charge 65,000*l.* upon the county cess of the baronies and town-lands within the catchment area of the river, payable by a similar charge, to be presented by the grand juries at each assizes. The share of the maintenance charge on the catchment area is about 2,675*l.* per annum, which, with the charge for the capital outlay, will require an addition of a penny in the pound to the grand jury cess in the catchment area. A sum of 65,000*l.* is to be raised by a mortgage of property connected with the river and belonging to the Government, and the residue of the cost of the works, not exceeding 65,000*l.*, is to be supplied as a free grant from moneys voted by Parliament; but it is not proposed that the works shall be undertaken without the consent of the persons chargeable, as we have mentioned, the increased voting power of the occupiers of the lands to be benefitted being, as we have also mentioned, three times as great as that of the occupiers of the rest of the catchment area, which is to be defined by the Lord-Lieutenant within the counties of Cavan, Leitrim, Roscommon, Longford, Galway, Westmeath, King's County, Tipperary, and Clare; and this area, when so defined, will be the contributory area for arterial drainage purposes.


On the Barrow, the area to be dealt with is one of 408,000 acres in the upper part of the river basin, above Athy, reaching from that place to the watershed all round to the west, north, and east. This catchment area is flat. As a drainage district it is one of the most important in Ireland, whether in respect of its position and attendant circumstances, or the extent of its area and of the lands flooded. But effectual drainage has never yet been accomplished, although at various times since 1847 it has been under consideration, and two portions of it have been dealt with, viz., the Rathangan district of 41,488 acres, and the Kildare district of 15,878 acres; but the chief and most difficult portion of 350,000 acres remains to be done. This upper portion of 408,000 acres cannot be effectually drained without going twelve miles further down the river to Carlow, for this length of river holds up the water and prevents the free escape of floods from the large area above Athy. It has plenty of fall—perhaps 2 ft. or 3 ft. per mile all the way to Carlow—but its average depth is, perhaps, not more than 3 ft., with a width of from 110 ft. to 150 ft. It is navigable by means of locks, of which there are five in the 12 miles; but it has a hard bottom, and this seems to be the real obstacle to all former attempts to provide an outlet for the floods of the large area above Athy, which are estimated to amount to 320,000 cubic ft. per minute as a maximum, and as this large body of water cannot get away from the rim of the basin, it floods 46,000 acres of land, extending for miles upwards along the river and all its tributaries. The construction of sluices in the existing solid weirs in this length of river is one of the works proposed, to facilitate the passage of flood waters, but unless the river be deepened, at least in the upper part of this 12-mile length, it would appear that the sluices would not have the effect of lowering the flood waters without destroying the navigation. The lowering of



the hard bottom of the river would be an expensive work, probably, but it was recommended by several of the witnesses. The amount proposed to be expended on the Barrow drainage is 360,000*l.*, of which 125,000*l.* is to be charged upon lands for the special benefit of which the works are designed, the charge being 4*l.* 10*s.* for every 100*l.* advanced by Government, payable for a term of forty years, and amounting to 5,625*l.* per annum. The annual maintenance charge upon these same lands will come to about 3,475*l.*, making in all an annual charge of 9,100*l.* Then 20,000*l.* is to be charged upon the county cess of those baronies and townlands which are situated within the catchment area, payable by a like charge. The share of the maintenance charges to be paid out of the county cess will be 600*l.* a year, and it is estimated that an addition of about a penny in the pound on the valuation of the lands and buildings within the catchment area will be sufficient to meet it. The residue of the cost of the works will be supplied—not exceeding 215,000*l.*—as a free grant from moneys voted by Parliament.

On the Bann, a great deal has already been done. The works were executed between 1847 and 1861, at a cost of 264,000*l.*, of which 109,000*l.* was a grant from Parliament. The objects aimed at were the drainage of the basin of the river and the provision of a navigable channel from Lough Neagh, near the centre of the river basin, to the tideway at Coleraine. Great benefits resulted from the drainage works, especially during the first ten years after their completion, both above and below the central lake, but the navigation of the lower length of the river has not paid as a commercial speculation; there is a railway on each side of it. The cause of the flooding of land of late years is partly due to the neglect to maintain this lower portion of the river in as good a condition as it was when completed and handed over to the Navigation Trustees in 1859, and it is proposed to charge upon the trustees of the navigation the cost of removing the obstructions. The works to be undertaken on the Bann are estimated at 65,000*l.*, of which it is proposed to charge 8,000*l.* upon lands specially benefited; 37,000*l.* upon the county cess of baronies and townlands within the catchment area; and the residue, 20,000*l.*, as a free grant from moneys voted by Parliament.

#### NOTES.

 RE print in another column the *Times* Report of a meeting held on Monday last in the Board-room of the City of London Union, to consider the possibility of rendering workhouse administration subservient to the education and training of able-bodied men in country pursuits. As will be seen from the report of the meeting, the idea of the Rev. S. A. Barnett, who moved the principal resolution, was to qualify men who could not find work in trade for working on land; in fact, to take labour to land that wants it; an idea which we have before strongly advocated. As will be seen from the report, a resolution in favour of the formation of a Committee to inquire into the practicability of thus applying surplus labour to unproductive land at home and in the colonies was carried by a large majority. We hope more will be heard of this proposal, which is at least well worth serious and prompt consideration.

THE case of "Croft v. The Rickmansworth Highway Board," which has been heard on appeal before the Lords Justices Cotton, Fry, and Lopes, with the result of a reversal of the previous judgment for the defendants, is of importance as a precedent in regard to the legal definition of a "drain," as used in section 67 of the Highway Act. The plaintiff was the owner of a house and grounds near Rickmansworth, on which grounds was a "dumb well," as it is rather absurdly termed, into which, at some period not clearly ascertained, the surface-water from the upper part of the adjoining land

had been conveyed in pipes, and left to percolate through the subsoil. In 1882 the Watford Board cleaned out this well, and substituted 9 in. pipes for the old 6 in. ones. The plaintiff objected to this, and when the Watford Board was dissolved, in 1884, he stopped up the well; but the Rickmansworth Highway Board, which succeeded to the jurisdiction of the Watford Board in 1885, re-laid the pipes and re-opened the well. The plaintiff's contention was that the terms of the Highway Act, under which the Board would be empowered to make and keep open "all ditches, gutters, drains, or watercourses," did not empower the Board to meddle with a well. The original judicial decision to the contrary is obviously in accordance with the spirit of the law. The so-called "well" in this case is not a well in the true sense, but a vertical drain, the term "well" being merely an ambiguity of language. The judges on appeal, however, have decided otherwise, and that such a well is not a drain within the meaning of the Act; a decision apparently more in accordance with the letter than the spirit of the Act referred to.

TUNISIA is something like a French colony.

According to a recent report of Consul-General Playfair, European enterprise is opening it in every direction, and a traveller will not find anything to interfere with his progress. A careful study has been made of and a system of conservancy commenced in regard to the ancient monuments with which the country is covered. A public library has been provided and a museum opened in the ancient Harem of the Bardo; the French civil and military officers throughout the country have united their efforts to those of better-known archaeologists for the purpose of collecting and preserving the antiquities which have been brought to light. The ecclesiastics, under the direction of the eminent Cardinal Lavigerie, have established a local museum on the site of the Byrsa at Carthage, and there is no more fear that acts of vandalism can ever be repeated. The native industries are few and in decadence. The wonderful plaster geometric tracery for which the Tunisians became so celebrated after the expulsion of the Moors from Spain may be almost regarded as a lost art, there being but few who can do this work at all, and none who can equal what was executed only fifty years ago. The same may be said respecting the exquisite Moorish tiles for which Tunis was once so celebrated, and which may be seen in perfection in the Dar-el-Bey, or town palace. There is only one man who continues to make them; he still retains the old tradition as regards colour and design, but the quality of the materials is no longer what it used to be, and every tile is marked with those unsightly blotches caused by the crows' feet which he uses to separate them during the process of baking. Pottery is made at Neboul, still of elegant form, possessing a beautiful green and yellow glaze—the tradition, no doubt, of Roman art.

SUBJECT to fuller advertisement, and deposit of statement and schedule of graves (under the Open Spaces Act, 1887) with the Holborn Local Board, Dr. Tristram, Chancellor of the London Diocese, has consented to issue, in October next, his faculty for laying out as a public garden the disused burial-ground,—situated in St. Pancras parish,—that appertains to St. George the Martyr, Holborn. The rector and churchwardens of that church, together with the St. Pancras Vestry, preferred their petition, in terms of the Metropolitan Open Spaces Act of 1881, in the Consistory Court on Friday, July 20th current. The burial-ground in question was established, immediately northwards of the Foundling Hospital, in virtue of 10 Anne, cap. 11. It was finally closed against interments in 1853. Here was buried, in her husband's grave, Anna, sixth and favourite daughter of Richard Cromwell. She was born at Hursley Park, near Winchester (her mother's inheritance), on March 27th, 1659, during her father's brief Pro-

tectorate, be it observed; and, having married June 19th, 1698, Dr. Thomas Gibson, Physician-General to the Forces, died, *s.p.*, in Bedford-row, on December 7th, 1727. The tomb may yet be identified by the carved arms which it bears of Cromwell and Gibson, per pale. About twelve months ago a committee was formed, with Mr. Butterfield as architect, for the restoration of the conspicuous monument bearing a Latin epitaph by Bishop Smalridge, which was erected in 1715 over the grave of Robert Nelson, author of "Fasts and Festivals of the Church." He, it is said, was the first to have been buried here, and with the idea of removing a violent prejudice that had arisen against the use of the ground. In the parish register of burials is the entry: "1714, January 28. Robert Nelson, Esq., of Gloucester-street. *Vir insignis.*" Here, too, were interred Zachary, father to Lord Macaulay; Jonathan Richardson, the painter (1771); and Dr. John Campbell (1775), editor of "The Biographia Britannica" and "The Lives of the Admirals." Within this area was held a quasi-public dissecting school, the last of its kind in London. With this burial-ground is often confounded the adjoining graveyard, of about one acre and a half, which belongs to the parish of St. George, Bloomsbury, as taken out of St. Giles-in-the-Fields in 1730. It was opened to the public, under auspices of the Kyrle Society and the Metropolitan Public Gardens Association, on July 1, 1884, by H.R.H. the Marchioness of Lorne.

THE case of *Burstal v. Hawksley*, tried before the Lord Chief Justice on Tuesday, turned on one of those disputes about professional charges which from time to time serve to illustrate the importance of having a clear understanding about everybody's position beforehand. The action was brought by Mr. Burstal, who had been resident engineer for the Oxford Corporation when the new filter waterworks were constructed, to recover 284*l.* from Mr. Hawksley, the well-known engineer, as two-fifths of the commission paid to Mr. Hawksley as engineer-in-chief, and which the plaintiff claimed as his share as engineer "jointly" with Mr. Hawksley. The case of the defendant, whose counsel disclaimed on his part any desire to contest the matter on mere money considerations, was that such a claim was opposed to the whole practice of the profession; that an engineer-in-chief had the whole responsibility and the commission, and a resident engineer was a person paid by salary by the promoters of the work, to assist in carrying out the directions of the engineer-in-chief. This, we believe, is a correct statement of the usual practice in the engineering profession,—of course, open to other arrangements by consent of both parties. In the course of the evidence, much of which was of a rather confused and confusing character, it appeared that much discussion had taken place at the Oxford Waterworks Committee as to the precise position the two engineers were to occupy, and that at a certain meeting (October 12, 1882), the Town Clerk—

"Scratched out the words 'as consulting engineer' after Mr. Hawksley's name, and 'as resident engineer' after Mr. Burstal's, and substituted the word 'jointly.' At the next meeting it was resolved that the word 'jointly' was not to constitute a partnership between Mr. Hawksley and Mr. Burstal, and that the former was to bear the sole responsibility. At a subsequent meeting, on April 21, 1883, there was this entry in the minute-book: 'The resolutions and correspondence as to the construction of the filter-beds were read, and after talking the matter over with Mr. Hawksley and Mr. Burstal, it was resolved that Mr. Hawksley be engineer-in-chief, and Mr. Burstal resident engineer,' &c."

A question as to the "intention" of this latter resolution was (naturally) objected to by plaintiff's counsel, and over-ruled by the Judge, as not evidence. Mr. Hawksley stated positively that he never had and never would act as "joint engineer" with any salaried officer of any local board or corporation; but he admitted that he said nothing as to the original proposal—"he was silent on the subject." There is no doubt that to Mr. Hawksley's mind the resolution at the meeting of April 21, 1883, would



convey the idea that he and Mr. Burstal were to occupy the usual positions of engineer-in-chief and resident engineer; but in default of any more definite evidence, it is not surprising that the jury, who very probably thought it was a case of oppression of a small professional man by a great one, gave a verdict for the plaintiff. The evidence did not necessarily lead to the verdict, but it left a way open for it, and Mr. Burstal has been fortunate enough to get a commission, which we imagine no one intended he should have, because various persons failed to put their meaning down clearly in black and white.

**THE Australasian Builders' and Contractors' News**, published in Sydney, and now in its second year of existence, gives in a recent number a view of the buildings for the Great Southern Hotel, Beaumaris, Victoria, and of the second premiated design for the New South Wales State House, at Sydney. The latter, designed by Mr. H. M. Robinson, architect, is a grandiose design in purely classic style, consisting on plan of a great hall, with a vestibule flanked by two wings projecting at right angles to the main building, to be used as museum and picture-gallery. The great hall is admittedly imitated in internal design from St. George's Hall, Liverpool, "the grandest and most successful hall of the kind in existence," says the Sydney paper. The vestibule forms the foundation for a lofty and finely-designed tower, crowned with a cupola. The Beaumaris Hotel is designed by Mr. Birtwistle, of Melbourne, and looks very like a regulation Grand Hotel at a large English watering-place, only rather more so.

**FULA**, or Foulia Island, North Britain, is in the market. It lies "far amid the melancholy main," in N. Lat. 60° 8', about eighteen miles west of Vaila Sound, on the Yetland (or Shetland) "mainland," and thirty-five miles north of the Orkneys. Its granite, quartz, and sandstone rocks present some of the finest coast scenery in Scotland, and are the haunt of the Skua gull, known locally as the "bonxie" or "skool." Measuring two miles and a half by one mile and a half, and belonging to Wallness parish, it has an area estimated at nearly 5,000 acres. The laird's house, of four rooms, is known as Liorafeld. Fula is supposed by many to correspond with Virgil's "ultima Thule." Yet Pytheas, the Greek navigator from Marseilles, who explored these remoter seas in the fourth century B.C., says in his work *On the Ocean*, that Thule (Θούλη) stood six days' sail distant from Britain, and that there, though some such report had already reached his readers, one night and day equally shared a whole year. In his *Geographiké Hypothesis*, Claudius Ptolemy, whose latitudes are fairly right, places Thule further south, in Shetland. It is highly probably that Fula, which is plainly in sight from Orkney during clear weather, is the spot mentioned by Tacitus. Describing the limit of his father-in-law Agricola's progress northwards, he writes:—"Invenit domitique insulas quas vocant Orcades, dispecta est et Thule." According to Bartholomew's Gazetteer of 1887, the population numbered 267 souls. They mostly get their living from the sea, and have one little landing-place for their fishing-boats at Ham, on the island's eastern shore. Shetland and the Orkneys formed Norwegian territory until 1468, when they were pledged to the Scottish crown in lieu of dowry for the Norse Princess Margaret on her marriage to King James III. The pledge was not redeemed when his successor James VI. espoused Anne of Denmark; and still, we suppose, remains in abeyance.

A GREAT deal has been written of late about signed verses; some people seem to think too much, but they will certainly not make the same complaint about signed gems. All gem-lovers will read with pleasure Dr. Furtwängler's "Studies" on gems with artists' signatures, the first of which appears in the new number of the "Jahrbuch" of the German

Archæological Institute (band iii., heft 2). Dr. Furtwängler calls attention to the fact that nothing systematic has been done in this direction since Brunn appended to his great book on Greek artists a list of gem signatures. Dr. Furtwängler has been led to study gems by the necessity of making a fresh catalogue of the collection of the Berlin Museum. As he rightly says, no one, unless he has access to and is constantly handling a large number of gems, can write to any purpose on the matter at all, as no department of archæology requires an eye so minutely trained. It will be impossible to summarise the article here; we can only note that it is accompanied by a plate of autotype reproductions, and that most of the signatures are given in facsimile.

**THE** late Sir George Harrison, during his tenure of the office of Lord Provost of Edinburgh, was mainly instrumental in procuring Blackford Hill as a place of public recreation, and at the eastern entrance to the hill there has been erected a structure to commemorate this and other services he rendered to the public. The memorial takes the form of a Roman triumphal arch, having a carriage-way in the centre and minor arches at each side for foot passengers. The centre archway, which is boldly rusticated, is 13 ft. wide and 17 ft. high to the keystone; it is flanked by attached Ionic columns on pedestals, and similar columns are placed on the outer sides of the minor arches, which are 4 ft. wide and 9 ft. in height. At the springing of the great arch there is a moulded string-course, above which the masonry is rusticated, having raised rectangular panels over the side arches for an inscription. An architrave, frieze, and cornice break over the columns, and in the centre there is a triangular pediment which is to contain a bronze medallion of Sir George Harrison. The whole structure measures 36 ft. in length and 30 ft. in height. The architect is Mr. Sydney Mitchell, and the bronze medallion is to be executed by Mr. Charles McBride, sculptor.

**THE** Echt estate, lying in Kincardine O'Neil, in the east of Mar, and just twelve miles due west of Aberdeen, and the ancestral home of the Lindsays, Earls of Crawford and Balcarres, is again offered for sale. A considerable part of the existing house, including the library and chapel, was designed by the late Mr. Street. The entire demesne extends to upwards of 8,800 acres, whereof more than one-half is under cultivation; 1,600 acres are moor-ground, stocked with grouse and black game; and 2,350 acres are wood-land; the net rental, as reduced, yields about 4,000l. a year. Near to the house are the Loch Skene and the present Earl's well-known private observatory of Dun Echt. This same property was put up for auction at the Mart just two years ago, but was withdrawn when the highest offer had reached 170,000l. We are reminded of Scott's lines:—

"Still is thy name in high account,  
And still thy verse has charms,  
Sir David Lindsay of the Mount,  
Lord Lion King-at-Arms!"

The Sir David de Lindsay, seventh feudal lord of Crawford and Glenesk, who was elevated Earl of Crawford on April 21, 1398, overthrew John, Lord Welles, King Richard II.'s envoy to Scotland, in the great tournament that was held on London Bridge on St. George's Day, 1390.

**MR. PERCY G. STONE, A.R.I.B.A.**, whose second premiated design for the Indianapolis Monument we published the other day, writes to us that he is getting together an account of the architectural antiquities of the Isle of Wight, and would be glad of any assistance in the way of drawings or notes, which would be duly acknowledged and carefully returned. It often happens that information on such subjects is offered after the publication of a book, when it is of no avail except for a second edition. Any one who may possess special information which he is willing to impart, by way of rendering the

proposed work more complete, is asked to be good enough to communicate with Mr. Stone, at 16, Great Marlborough-street, W. There is such a freemasonry among true archæologists that we have no doubt they will respond to such a request in the spirit in which it is made.

**WE** published a few weeks ago an illustration of Mr. Mullins's memorial statue to Barnes, the Dorsetshire poet. The *Edinburgh Review*, in a sympathetic notice of his works, reminds us of one which we had forgotten, and which shows how the author of "Hwomely Rhymes" could make a spirited little poem on so commonplace an event as the building of a small house on a plot of freehold ground. The reviewer says:—

"John Blake, — 'Merry Bleike of Blackmwoore'—  
had a bit of ground which came to him by his mother's side, and an uncle left him a legacy of 300l. His wife and daughters approved of his purpose of building a house and paying no rent, and he lost no time in commencing the undertaking.

"Then John he call'd vor men o' skill,  
An' builders answered to his call;  
An' met to reckon, each his bill,  
Vor floor and winow, ruf an' wall."

The negotiations which ensued are vividly described:—

"An' woone did mark it on the groun',  
An' woone did think, an' scratch his crows,  
An' reckon work, an' write it down:  
'Zoo, zoo,' woone treidestman cried,  
'True, true,' woone mwore replied.  
'Aye, aye; good work an' have good pay,'  
Cried merry Bleike of Blackmwoore."

When the bargain was struck, there was no procrastination, nor were the workmen hindered from doing their best by any trades-union regulations:—

"The work begun, an' trowels rung,  
An' up the bricken wall did rise,  
An' up the slanten refters sprung,  
Wi' busy blows an' lusty cries!  
An' woone brought planks to meike a vloor,  
An' woone did come wi' durns o' door,  
An' woone did zaw, and woone did bore.  
'Brick—brick, there down below,  
Quick, quick,—why b'yo so slow?'  
'Lime, lime,—why do we waste the time,  
Vor merry Bleike of Blackmwoore?'"

Then follows a description of the house-warming, and the healths and good wishes, and of the owner's satisfactory reflections on the following morning when he fully realised the greatness of his new possession:—

"An' when the morrow's sun did shene,  
John Bleike behold, wi' jay an' pride,  
His bricken house, an' pwoch an' green,  
Above the Stour's rusby side.  
The swallows left the twosome groves  
To build below the thatchen oves,  
An' robins come vor crumbs o' wloaves:  
'Tweet, tweet,' the birds all cried;  
'Sweet, sweet,' John's wife replied;  
'Dad, dad,' the children cried so glad,  
To merry Bleike o' Blackmwoore."

It will be observed that these architecture, even in its humblest form, is represented as pre-eminently the social art, the centre of life and society. John Blake's "bricken house" was probably a poor object enough architecturally (in the ordinary sense of that word), but it aroused the honest exertions of the local artisans, the birds clustered round and built on it, and the wife and children were happy over it, and so it became a centre of human affections and interests, and had a poetry of its own, like many another cottage, "bricken," or rough-dashed, or half-timbered, or even—but no, one must draw a line somewhere: we cannot fancy even simple-minded John Blake feeling "jay and pride" over a corrugated iron shanty!

**The New Government Buildings in Christiania.**—The committee (consisting of the leading architects in Norway, Sweden, and Denmark) charged with the consideration of the designs invited for the new Government buildings to be erected in Christiania,—to which we recently referred,—have rejected in their present form all the plans submitted, the chief objection being the unsuitability of the material proposed for a severe climate like that of Norway. However, in accordance with the terms of the competition, five of the competitors, who will receive fees, have been invited to send in amended designs. The cost of the building is to be about £100,000.

\* Door-posts.

† Eaves.



### THE WHITEFIELD CHAPEL, AND ITS BURIAL GROUND.

It is satisfactory to find, from Lord Brownlow's reply to Lord Meath's inquiries in the House of Lords a few days ago, that the Government are alive to the scandalous uses which the disused burial-ground along the northern side of Whitefield's Chapel, in Tottenham Court-road, is now made to serve. A lease was granted in 1756 to George Whitefield, from out of the Southampton estate, of a plot of ground known as the Crab and Walnut Tree field, by Coyer's Gardens and the Little Sea pond. The original building, being about 70 ft. square on plan, and vulgarly styled the "Soal-Trap," was enlarged in 1759 by the addition of an octagonal front,—the "Oven." The story goes that this was done mainly at the cost of King George II.'s consort, who had seen a large crowd at the doors; but this could not be, since Queen Caroline of Anspach died in 1737. Whitefield died, in America, in 1770, which demolishes another oft-repeated tale that he caused some consecrated earth to be carried hither from St. Christopher-le-Stocks. That church was not finally dismantled until about 1788, for the enlargement by Sir John Soane of the Bank of England towards the west and north: its graveyard yet remains, within Garden-court, at the Bank.

It appears that in the year 1828 the original lease as obtained by Whitefield fell in, and the chapel for awhile was closed. In 1831 some trustees bought the copyhold for 20,000*l.*, but incurring considerable expense in repairing the damages by a fire, they found it necessary to mortgage the site. Since only portion of their debt was discharged, the mortgagee foreclosed. Then ensued litigation upon various differences and disputes, which seems to have not yet concluded. In 1853 the ground was closed against further interments. Four years later an injunction was obtained against the owner of the land, who had tried to take away some gravestones. On two occasions since, he has been prevented from building over the land. On the other hand, it is stated that in 1879 the owner was successful in exerting his rights as against the St. Pancras Vestry, who had designed to plant trees here. He has now, in Lord Meath's words as reported, "hit upon the ingenious device of inviting all the perambulating fairs in the country to come there." This license, however, is restricted by the Court in so far as not to interfere with the conduct of divine service. Yet a good deal more is needed. The Earl of Brownlow said that the Treasury solicitor has been instructed to apply existing statutes for ensuring an abatement in this particular quarter, of what is generally considered as a nuisance; adding that, failing this remedy, the Government will not hesitate to take such steps as shall secure an alteration in the law. A Bill, *ad hoc*, was recently blocked in the House of Commons.

We may here add that in terms of the Metropolitan Open Spaces Act of 1881, the owners of any burial-ground within the metropolis, and which is closed for burials, may provide for its being laid out as a recreation-ground under conveyance to, or arrangement with, the Metropolitan Board of Works, the Vestry, or the District Board,—a faculty, however, being required in the case of any consecrated ground. Again, the Disused Burial Grounds Act of 1884, declares (section 3) that it shall not be lawful to erect any buildings upon any disused burial-ground [as closed by order in Council], except for the purpose of enlarging a church, chapel, meeting-house, or other places of worship. But this prohibition does not extend to, *inter alia*, any burial-ground which has been sold or disposed of under the authority of any Act of Parliament, or to buildings for which a faculty was obtained before the passing of the Act in 1884.

**The Institution of Mechanical Engineers.**—The Summer meeting of the Institution of Mechanical Engineers will be held in Dublin on Tuesday next, the 31st inst., and two following days, under the presidency of Mr. Edward H. Carbutt. An influential committee has been formed for the reception of the Institution, under the chairmanship of the Right Honourable the Earl of Rosse, F.R.S. On Friday, August 3rd, a visit will be paid to Belfast, on the invitation of a local committee presided over by the Mayor, Sir James H. Haslett.

### THE NEW WORKS AT BARKING SEWAGE OUTFALL.

We mentioned last week (p. 44), in our report of the proceedings in connexion with the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, that a visit was paid on Saturday, the 14th inst., to the extensive, elaborate, and costly sewage precipitation works now in course of construction by the Metropolitan Board of Works at the Northern, or Barking, Outfall of the Metropolitan Main Drainage System. The works have since been visited (on Tuesday last, the 24th inst.) by the Society of Engineers. On the occasion of the first visit, the following description of the works, by Sir Joseph Bazalgette, their engineer, was read by Mr. Thomas Cole, the secretary of the first-named Association:—

At the present time, the whole of the sewage of the metropolis north of the Thames is conveyed to Barking Creek by three culverts, each 9 ft. high by 9 ft. wide, and is in the first instance delivered into a covered reservoir, divided into four compartments, and altogether extending over an area of nine acres. The sewage is stored in this reservoir during eight hours of each tide, and discharged into the river at high-water at the top of the ebb. This reservoir is situate on the east side of the sewer, and immediately adjacent to the river bank.

The works now being constructed consist of covered precipitation tanks adjacent to this reservoir on its north side, and occupying the ground between the outfall sewer and Barking Creek, an area of between ten and eleven acres.

There will be thirteen of such tanks, each 31 ft. 6 in. wide, placed parallel to the northern side of the existing reservoir, of somewhat unequal lengths, but averaging about 1,000 ft. long. Communications will be made between the outfall sewer and each of these tanks, each fitted with two penstocks, so that communication may be opened or shut off at pleasure.

The sewage will be admitted into each of the tanks in succession, and after being allowed to remain quiescent for a sufficient time to admit of the deposit of the solids in the sewage, the precipitation of which will be expedited by the admixture of 3·7 grains of lime and 1 grain of proto-sulphate of iron per gallon, the effluent will be run off over a weir, which will fall as the water in the tank lowers, so that the top film of the effluent only will be taken off and the tank emptied gradually, so as to prevent any disturbance of the solids by the operation.

The effluent, after flowing over the weirs (of which there will be ten in each tank), will pass into culverts carried transversely under the tanks, and extended,—some into the compartments of the existing reservoir,—and some into a chamber under the outfall sewer through which at present the sewage is discharged into the river from the existing reservoirs. When the level of the tide will admit, the effluent will be discharged through this chamber direct into the river, but when the water in the river is too high to admit of this, the effluent will be conveyed by the other culverts into the several compartments of the present reservoir, and stored there until the level of the water in the river will admit of its discharge.

When each compartment is emptied of the effluent, the sludge, which will be in a semi-liquid state, will be discharged through culverts passing under the outfall sewers into a collecting culvert, from which it will be conveyed by pipes into a receiving well or sump, and pumped into a series of twelve tanks placed side by side, and situate between the outfall sewer and the river. These tanks will each be 20 ft. wide and 140 ft. long, will cover an area of over an acre and a half, and, like the precipitation tanks, will be covered, so as to prevent nuisance. The sludge will be allowed to remain quiescent in them so as to allow of a further precipitation, and the effluent water will be discharged over weirs into a culvert, which will convey it into a store under the tanks, from whence it will be lifted and discharged through pipes to the liming station, there to be mixed with the lime which is used for precipitation.

The settled sludge remaining after this further precipitation will be discharged through culverts into a sludge store situate under the tanks, and will be lifted thence and conveyed by pipes along a jetty and to a landing stage to be erected in the river, and there discharged

into ships, which will convey the sludge to sea. In the event of the ships being detained by stress of weather, there is a further store for the sludge at a lower level, extending under the whole of the area occupied by the upper store.

On the north side of these sludge settling-tanks will be erected engine and boiler houses and workshops in connexion, to contain engines and machinery for lifting the sludge into the settling tanks and the settled sludge into the ships, as well as for pumping the sludge effluent to the liming station.

The lime for assisting the precipitation of the solids of the sewage is to be introduced into the outfall sewers at a point about 700 yards, and the proto-sulphate of iron at a point about 530 yards, above the precipitation channels.

The liming station will comprise a lime store; floors for slaking the lime; six tanks for mixing the slaked lime with the effluent water from the sludge settling tanks, or with sewage taken direct from the outfall sewers; and an elevated lime-water tank or reservoir built above the lime-store, and into which the lime-water will be lifted by pumps, for which machinery and the requisite engine and boiler houses will be erected adjacent to the lime-stores. From this elevated tank the lime-water will be conveyed to and injected into the sewage passing along the outfall sewers through cast-iron injectors placed in the sewers.

There will be means of turning the lime water into any one of the three lines of sewers, and of regulating the supply by means of sluice-valves fitted to the pipes leading to the injectors. The injectors consist of cast-iron chambers, 4 ft. 6 in. in length, 6 in. wide, and 6 ft. in height, fitted with a number of nozzles through which the lime-water will be injected and mixed with the volume of the sewage as it flows past.

The iron-water station comprises timber-sheds for storing the proto-sulphate of iron, a mixing-shed in which the iron will be crushed and mixed with water, an engine-shed to contain engines and machinery for crushing the iron and mixing it with water, as well as for raising water for boilers and into mixing tank. The iron water will be conveyed by stoneware pipes carried underground and along the top of the outfall sewer into a service-tank, from which it will be carried by pipes into each of the three outfall sewers, and injected into the sewage through perforations in a pipe fixed vertically in each of the sewers. As with the lime-water, there will be appliances for regulating the supply of iron-water to each of the sewers, to meet the varying requirements of the discharge.

There will be a large settling-pond covering an area of 14 acres situate near the river, divided into six compartments, each 60 ft. by 60 ft. and about 7 ft. deep, into which water will be received from the river and allowed to settle, the clear water being afterwards filtered and used for the supply of the several boilers, for slaking the lime, and for mixing with the proto-sulphate of iron.

There will be a timber and coal shed for storing a supply of coal for the various engine stations. It will be situate on the western boundary of the Board's land, and will be 126 ft. long by 31 ft. in width. In consequence of the unsatisfactory nature of the ground, this shed and the other timber buildings will be carried upon piles, which will be carried up to support the roof.

The jetty, which will extend 576 ft. into the river from the present river bank, will be 15 ft. wide, and will be a timber structure supported upon piles. At the river end of the jetty will be a pier or landing-stage, 300 ft. in length, and 20 ft. wide, the front of which will range with the pier of the Beekton Gasworks. This pier will also be of timber, supported upon piling, and protected by dolphins at each end.

The iron pipes for conveying the sludge to the ships will be carried under the platform of the jetty and pier, and will be furnished at the end with a delivery-pipe, socketed to admit of a vertical movement, so as to conveniently discharge the sludge into the ships at all levels of the tide. The pier and dolphins are arranged for two ships to lie alongside at the same time.

A tramway will be laid along the full length of the pier and jetty, and will be extended through the works on the west on a higher level to the coal store and liming station; and to the east on a descending level to the iron-water station. There will be branches from this on the low level to the general coal store and main



engine station to the north of the sludge-settling tanks. The trams will all be above the present surface of the ground, and will be generally carried upon earth in embankments; but in some parts upon timber staging.

These tramways will enable the coals, lime, proto-sulphate of iron, and other materials used on the works, to be unloaded at the pier or jetty, and delivered with facility to the several stations, and will facilitate the distribution of coal from the general coal store to the several engine stations.

The contract for these works includes the erection of twelve cottages and a residence for the superintendent, and the diversion of the old Gallions sluice and ditch, which is one of the main sewers under the jurisdiction of the Essex Commissioners of Sewers.

There will be a large quantity of surplus earth from the excavations, which will be used in forming the banks for the tramways and in raising the general level of the ground, which is now 6 ft. or 7 ft. below the level of Trinity high water.

The works extend over an area of about 50 acres, the quantity of sewage to be dealt with will amount to about 90,000,000 gallons per day, and the quantity of lime to be used in purification is 23 tons per day.

Two contracts have been entered into for the execution of these works,—one with Messrs. John Mowlem & Co., for the general works, for 406,000*l.*; and the other with the Glenfield Company, of Kilmarnock, for engines and machinery, for 42,567*l.*

The foregoing description was, in substance, read by Mr. Arthur T. Walmisley, the President of the Society of Engineers, to the members of that body who visited the works on Tuesday last.

The visitors on both occasions referred to were very kindly received and conducted over the works by Mr. G. Marshall, the assistant engineer; Mr. George Burt, jun. (of the firm of John Mowlem & Co., the contractors); Mr. William Bewell, the contractors' engineer; Mr. John Jackson, the contractors' manager on the works; Mr. Pope, the clerk of works, and other officials. Mr. Burt, in the course of the proceedings, said that they (the contractors) had now been on the ground some sixteen or seventeen months, during which period they had had a good deal of bad weather. In that period they had excavated and removed something like 400,000 cubic yards of stuff, chiefly of a peaty or boggy nature, and principally got out of holes 6 ft. square by an average of 30 ft. in depth. (These holes, it may be explained, were excavated, right down to the gravel, for the brick piers which, resting on concrete, form the main supports of the structural brickwork of the precipitation and sludge tanks.) They had used 30,000,000 of bricks and 36,000 tons of Portland cement, while 300,000 tons of ballast had been put in as concrete.

The gault bricks used on the works were made at and supplied from the Aylesford Pottery, near Maidstone (Mr. Joseph Hamblet, manager). Mr. Hamblet also supplied a large quantity of blue bricks from his works at West Bromwich. The iron roofs of the engine and boiler-houses have been supplied by Messrs. Handyside & Co., of Dorby, and the iron pipes, valves, penstocks, injectors, &c., by Messrs. Oakes & Co.

We may add that we gave a tolerably full description of the works last year (see *Builder*, Dec. 17, 1887, p. 838); and that in the *Engineer* for Feb. 4 and Feb. 11, 1887, will also be found an illustrated description of the works. Works of a similar kind, for dealing in the same manner with the sewage of the south side of the Metropolis, have lately been commenced by the Metropolitan Board at the Crossness Outfall works, and the tender of Mr. William Webster, amounting to 259,816*l.*, has been accepted for the construction of these works.

**Testing Roof Slates.**—A German trade journal advocates the following method for testing the quality of roof slates. The samples of the slate to be tested should be carefully weighed, and then put into boiling water for a quarter of an hour. The water must, however, be fairly free from lime, saltpetre, and ammonia. The slates are then re-weighed, and those that show the greatest increase in weight are those most capable of resisting deterioration.

#### BRISTOL AND GLOUCESTERSHIRE ARCHEOLOGICAL SOCIETY.

THE thirteenth annual summer meeting of this Society was, as briefly mentioned in our last, opened in Gloucester on the 16th inst., when, although rain fell in torrents, there was a good attendance, about fifty or sixty members and friends being present. At noon the members assembled in the Tolsey, and were welcomed by the Mayor on behalf of the citizens. The proceedings of the meeting at once commenced, under the presidency of Lord Sherborne.

The Rev. W. Bazeley read the report of the Council for 1887-8, which stated that there are at present 389 annual members, 77 life members, and 3 honorary members,—a total of 469. The income for the year, with the balance brought forward from the previous year, was 535*l.* odd, the expenditure 271*l.*, and the balance in hand on April 21 was 263*l.* From this, however, had to be deducted the cost for the annual volume of Transactions. A balance of 80*l.* was still due from the Berkeley MSS. fund to the general fund. The Society had also a funded capital of 432*l.* There had been three meetings during the year,—the annual Summer meeting at Stratford-on-Avon, the special meeting at Tockington Park to inspect the then recently-discovered Roman villa and tessellated pavements,\* and the annual Spring meeting six weeks ago at Chipping Sodbury. In August the Council issued a prospectus for printing, by private subscription, the Cartulary of Winchcomb Abbey, Lord Sherborne, President of the Society, having placed the original MS. at the service of the Council, and the Rev. D. Royce having offered to edit the papers free of cost. The promised subscriptions, however, fell considerably below the estimated cost of printing, and Mr. Royce had now determined to print the Cartulary on his own responsibility, the subscription being thrown open to the public. During the year the Council has endeavoured on more than one occasion to "arrest the hand of the destroyer." The Dursley secretary having reported that the tumulus at Uley, known as "Hetty Peglar's Tump," which was scheduled in the Act for the Protection of Ancient Monuments, was being damaged by mischievous persons, the general secretary and Colonel Forbes were asked to inspect the tumulus, and report. It was found that several stones forming the chamber had been removed, and that the whole structure was in a dangerous condition. The report was sent to General Pitt-Rivers, who had promised to take the necessary steps for the protection of the tumulus, but pointed out that the Act was passed to enable magistrates to punish summarily, and that persons who live near scheduled ancient monuments should assist in bringing delinquents to justice. It had also been brought to the notice of the Council that in the Spring the ancient camp near Clifton Observatory, and part of the Roman wall at Gloucester, were in danger of demolition. A protest was made, and the Council rejoiced that the danger in each case had for the present passed away. The rector and churchwardens of Dursley had also been written to, pleading for the preservation of the old communion plate at the parish church, which it had been suggested should be converted into vessels of a less cumbersome pattern. The report referred with regret to many officers and members of the Society who had died during the year, mentioning Sir W. V. Guise, one of the principal promoters, the first president, and president of the Council for ten years; Mr. S. H. Gael, Cheltenham; Colonel Lowe, and Mr. E. Witchell, Stroud. The Council nominated for re-election Sir Brook Kay as president of the Council, the vice-presidents, treasurer, and secretaries, and also nominated as vice-presidents Sir H. Barkly, president for 1886-7; Professor Middleton; Mr. F. F. Fox, chairman of the Chipping Sodbury local committee; Mr. F. James, Edgeworth Manor; and Mr. Wilfrid Cripps, Cirencester; also Mr. C. Witchell as local secretary for Stroud, the Rev. E. Evans for the Newent district, and the Rev. H. L. Thompson for the Thornbury district.

The report was adopted, the various officers were elected, and a vote of thanks was passed to Lord Sherborne, the retiring president, who introduced the president-elect, Mr. R. V. Vassar-Smith, ex-Mayor of Gloucester.

The president-elect read his inaugural address, which had reference to the muniments of the

Gloucester Corporation. These documents are now being examined by Mr. Stephenson, who will prepare a report for the Historical Manuscripts Commission. The President read a number of extracts from these papers, giving interesting particulars of the history of the city, and recounting, among other matters, the visit of King Henry and Anne Boleyn to Gloucester.

A vote of thanks was accorded to the President for his paper, and he, in reply, thanked the Society for having elected him President for the year.

In the afternoon the Dean received the members in the Chapter House of the Cathedral, and having welcomed them and briefly referred to the interesting history of the room in which they were assembled, he escorted the visitors into the Cathedral, where he gave another address descriptive of the various styles of architecture to be found in it, and a running commentary on the historical personages whose names were associated with the great building. The party then divided into three sections, and were taken over the building under the guidance of the Dean, the Rev. W. Bazeley, and Mr. F. W. Waller, architect. Afterwards the party visited the Deanery.

A meeting was held in the evening at the Tolsey, for reading and discussing papers. Among these, Mr. Henry Jeffs read a paper on "The Mason's Square and Masons' Marks," with special reference to Gloucester Cathedral, illustrated with diagrams. These marks abound at Gloucester, where there is also, in the south transept, a curious monument in the form of a mason's square, and underneath it figures of a man and boy, the former having mason's tools in his apron. Tradition says that this is the monument of one John Gower, who was employed in converting the Norman work of the transept into Early English, and that he killed the boy, who was his apprentice. Mr. Jeffs showed that neither the modern Fraternity of Freemasons nor the Lodges of Mark Masons had anything to do with the masons' marks in buildings. He showed that these marks were to be found in ancient buildings in Egypt, on the Pyramids, in Greece, throughout Europe, and in Mexico, Peru, &c., while some of those in Gloucester Cathedral resembled the marks found in Carthage and in the Egyptian almanacs. He suggested that these marks, which had long formed an enigma apparently not to be solved, were nothing more than marks made by the workmen, just as used to be, and was still, the practice for workmen in the porcelain manufacture to put a mark on their products.\* He considered that the modern trade-mark was simply an imitation of these masons' marks, and that many of the marks in old stones in our churches were cut by the workmen as a pastime, as men nowadays cut their names on oak benches.

Mr. Henry Medland, architect, next read a long and interesting paper on St. Oswald's Priory, Gloucester. The earliest presumed foundation of this institution was given as about 660, but the more generally received account was that it was founded in 909 by Ethelred, Prince of the Mercians, and his wife Ethelfreda, daughter of Alfred the Great, in honour of St. Oswald, King and Martyr. Mr. Medland gave an outline of all that is reported of Oswald, how he became a Christian, and aided in the spread of the Christian religion, and was associated with the founders of Iona and Lindisfarne, and how he fell in battle, and his body was hacked in pieces. It is stated that some of his relics were brought to Gloucester. Mr. Medland traced the history of the Priory, and showed that at the Dissolution the seven canons who then occupied the Priory were sent forth to the world with 16*s.* 8*d.* divided between them. The south aisle of the Priory church became the parish church of St. Catherine, but at the siege it was greatly damaged, and the Parliament gave the building to the Corporation, who used the roof and part of the material in the erection of a barley market in another part of the city. What remains of the ancient church is now a beautiful ruin, and, thanks to Mr. Medland's care, many fragments of the old Priory are built into it. The other part of the Priory has entirely disappeared, and some of the estates were given by King Henry VIII. to the Dean and Chapter of Bristol. One most interesting feature of Mr. Medland's paper was an account of the discovery by him, a month ago, of a beautifully sculptured stone, bedded in a wall adjoining the Priory. This stone evidently

\* See illustrations in the *Builder* for Nov. 19, 1887, p. 690.

\* This is no new suggestion. The subject, as many of our readers will know, was one which was pretty fully investigated by the former Editor of the *Builder*, the late Mr. George Godwin.



formed the shaft base of a churchyard cross; the sculpture is Celtic in character, and it is suggested that it formed part of a memorial to St. Oswald, and was the work of an artificer from Iona or Lindisfarne.

On the 17th inst. the members again assembled at half-past nine, when Mr. John Bellows gave an address on "Roman Gloucester," in which he described how Roman camps were formed along the banks of the Rhine, and in other parts of Europe, and how, after arrangements had been made by building ships in Holland, the landing of some 25,000 Roman soldiers in this country was effected, and the first camp was erected at Winchester. The invaders extended themselves over this country, and Gloucester became one of their chief settlements. He quoted evidence to show the progress made by the Romans in the neighbourhood, and described the formation of their camps, showing that the principal outline of the present chief streets of Gloucester followed the lines of the Roman colony. Immense numbers of Roman coins had been found in Gloucester and the vicinity, as well as tessellated pavements, remains of temples, &c., all showing the importance of the settlement. The Romans walled in the city, and portions of the wall yet remained, while the line of its boundary could be definitely traced. The Rev. W. Bazeley followed with a paper on "Medieval Gloucester," and the remainder of the day, the rain fortunately holding off, was spent in perambulating the city and inspecting the Roman remains, the ancient churches, the remains of the Grey and Black Friars, and the many interesting old houses. Explanations in regard to all these places were given by Mr. Bellows, Mr. Waller, and others. In the evening another meeting was to take place to hear papers read. These included the Rev. W. H. Davies on "The Grey Friars," the Rev. S. E. Bartlett on "The Hospitals of SS. Margaret and Mary Magdalene," Mr. Wilton on "Gloucester Tokens"; and two or three others.

There was heavy rain on Wednesday, the 18th inst., but five or six vehicles started for Brookthorpe, Haresfield, Standish, Hardwicke Court and church, and Elmore Court. At night there was a *conversations* and inspection of the museum.

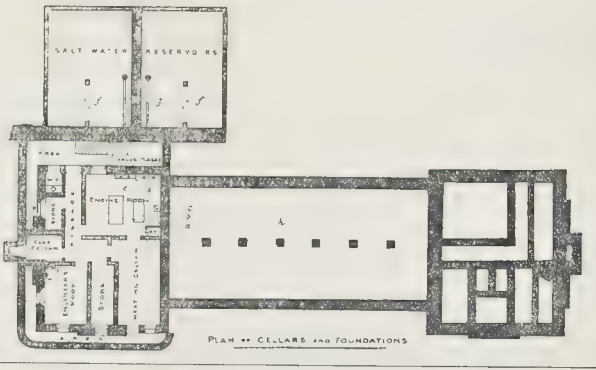
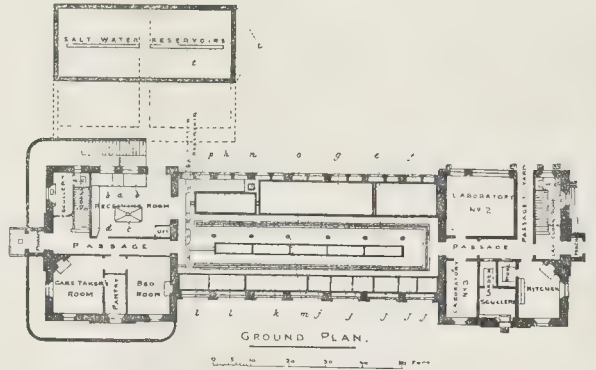
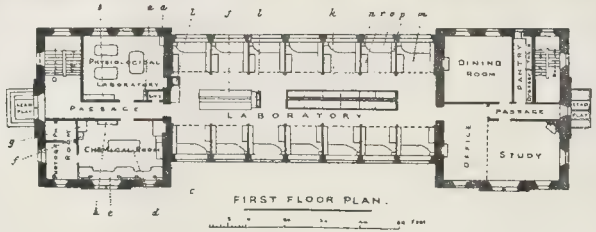
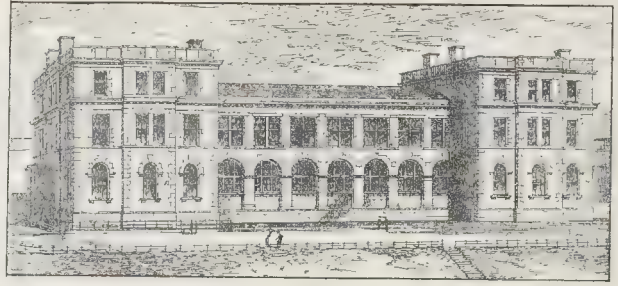
The closing meeting was held on Thursday, the 19th, when Cheltenham was selected for the next summer meeting, the appointment of president being delegated to the Council. The usual votes of thanks were passed, and then a large party started, in carriages, to inspect the ancient church and camp on the summit of Churchdown Hill, the beautiful Decorated church at Badgworth, and Prinknash Park, an interesting residence on the slope of the Cotswolds, built as a summer residence by an abbot of Gloucester, and which, in old days, was visited by Henry VIII. and Anne Boleyn. Mr. Dyer-Edwardes, the present owner of the property, and Mrs. Dyer-Edwardes, hospitably received the visitors, who inspected the interesting old mansion, after which they returned to Gloucester. The whole four days' proceedings wound up with a "city meeting" at the Shirehall, at which the Dean presided, and addresses on historical subjects and buildings were given.—(Abridged from the *Bristol Times and Mirror*.)

#### THE MARINE BIOLOGICAL LABORATORY AT PLYMOUTH.

We recently quoted from *Nature* a general description of this new building. As the building is one of some novelty and interest, we now publish a small view of it, and three plans.\*

The Laboratory is situated between the south wall of the "Citadel" and the Sound, at a height of 95 ft. above the level of the sea. The site, which has been granted to the Association by the War Office, occupies the whole length of King Charles's Curtain, 265 ft., and extends southwards from the citadel wall 240 ft., giving a surface of, say, 63,600 ft. A road lies between this plot of land and the sea, and private access to a small section of the seaboard is provided for by means of a tunnel, 7 ft. 6 in. high and 6 ft. 6 in. wide, which leads from the area surrounding the cellars, beneath the road to the rocks below.

\* The view and plans are reduced copies of illustrations which appeared in the first number of a new and interesting quarterly magazine, entitled the "Journal of the Marine Biological Association of the United Kingdom." We reproduce them by permission, and also quote some particulars of the building from the description given by Mr. Walter Hesse, M.A., in the "Journal."



The Marine Biological Laboratory, Plymouth.

#### REFERENCES TO PLANS.

*Plan of Cellars and Foundations.*—a, Four-horse power gas-engine; b, Two-horse power gas-engine; c, Compressed air receiver; d, Duplicate pumps, to throw 7,500 gallons an hour; e, Duplicate pumps to throw 2,000 gallons an hour; f, Arching in plan; g, Drains; h, Foundations for pillars to support Dennett's arching.

*Ground Plan.*—a, Sink in Receiving-room; b, b, Tables; c, Slate-topped table; d, Shelves; e, Five table tanks, each 9 ft. 9 in. long, 2 ft. 3 in. wide, 1 ft. 9 in. deep; f, Tank, 15 ft. 6 in. long, 9 ft. wide, 5 ft. deep; g, Tank, 30 ft. 6 in. long, 9 ft. wide, 5 ft. deep; h, Tank, 15 ft. long, 5 ft. wide, 5 ft. deep; i, Six tanks, each 5 ft. long, 4 ft. wide, 4 ft. deep; k, Tank, 15 ft. long, 4 ft. wide, 4 ft. deep; l, Two tanks, each 10 ft. long, 4 ft. wide, 4 ft. deep; m, Pillars to support Dennett's arching; n, Manhole into circulating reservoirs along north side; o, Trench covered with grating containing hot-water pipes; p, Culvert conveying salt-water from circulating to main reservoirs; r, Raised portion of reservoirs.

*First-floor Plan.*—a, a, Two sinks in Physiological Laboratory; b, Cupboard with air-tight glass doors; c, Sink in Chemical Laboratory; d, Slate-topped table; e, Bench; f, Blowpipe table; g, Sink cupboard; h, Shelves; i, Slate-topped table in main Laboratory; k, Twelve tanks, each 1 ft. 6 in. deep, 2 ft. 3 in. wide, 5 ft. long; l, Two sinks; m, a "Compartment"; n, Sink; o, Bench; p, Shelves; r, Tables with drawers and cupboards.



The building is placed 90 ft. from the wall of the Citadel, and is about 60 yards from high-water mark. It is in the form of two blocks, which are each 34 ft. 6 in. long by 42 ft. wide and three stories high (40 ft.), and a central connecting portion 70 ft. long by 34 ft. 6 in. broad and two stories high (30 ft.). The east, south, and west fronts are built entirely of dressed limestone, which has been excavated on the spot; but on the north front the window and door dressings are of brick.

The roof of the central portion is peaked and covered with slate; that of the two blocks is flat and covered with lead.

Below the western block cellars have been excavated (see plan of them) 14 ft. deep, surrounded by an area 6 ft. 6 in. wide on the north and 4 ft. wide on the west and south sides; further, the excavation has been extended between the cellars and the Citadel wall to form two reservoirs for salt water, each 37 ft. 6 in. long, 21 ft. 6 in. wide, and 13 ft. deep, and each capable of holding 50,000 gallons. The roof of a portion of each of the reservoirs (see left-hand top corner of ground-plan) is 6 ft. higher than the remainder, and is fitted with a gangway (t) to enable a man to walk inside. These reservoirs are built of concrete, and coated with a special asphalt supplied by Messrs. Leete, Edwards, & Norman, of London; they are arched in with brick and completely covered over.

The arrangement of rooms in the building is as follows:—

**Cellars.**—The cellars (see plan) are 13 ft. high, and consist of an engine-room, 20 ft. by 16 ft.; a boiler-room, 20 ft. by 11 ft.; an engineer's room, 13 ft. by 11 ft.; a coal-cellar, store-room, and w.c. Access to the cellars is provided for by means of steps down into the area on the north side.

**Ground Floor, West Block.**—The rooms on the ground floor (see plan) are 12 ft. high. The main entrance to the building is in the centre of the west face of this block, and leads, on the one hand, by means of a straight passage 6 ft. wide direct into the aquarium, and, on the other hand, by means of a staircase 9 ft. wide, to the first floor. A urinal is placed leading from the landing of this staircase. On the south side of the entrance are two rooms to serve as kitchen and bedroom for the caretaker of the building; these rooms are each 14 ft. by 12 ft., and between them is a pantry 9 ft. by 6 ft. On the north side of the entrance the scullery and offices for the caretaker, the staircase leading to the first floor, and a "Receiving Room" 20 ft. 6 in. by 16 ft. are placed.

**Centre.**—The central part is occupied by the aquarium, from the east end of which a door leads into the

**East Block.**—On the north side of this block is Laboratory II., 17 ft. 6 in. by 16 ft.; on the south side Laboratory III., 15 ft. by 9 ft. The remainder of this floor of the block is occupied by the kitchen and offices of the superintendent's residence. The main entrance to the residence is in the centre of the east face of the block; it leads into a passage from which direct communication with the aquarium is provided. A staircase 7 ft. wide leads to the first floor. A back door is placed on the north side.

**First Floor, West Block.**—The rooms on this floor (see plan) are 11 ft. high. The staircase opens on to a landing above the entrance hall, and from this point a staircase communicates with the second floor, and a passage 6 ft. wide leads into the main laboratory. On the north side of this passage is the Physiological Laboratory, 20 ft. 6 in. by 16 ft.; on the south side the Chemical Laboratory, 22 ft. by 14 ft., and a small room communicating with the latter, 8 ft. by 14 ft., which is designed to serve as a photographic room. These two laboratories are entered through doors which open into the passage. At the end of the passage a door leads into the

**Centre.**—The main laboratory occupies the whole of the first floor of this portion of the building. It is provided with seven large windows on each side, which reach from a point 2 ft. 6 in. from the floor to a height of 10 ft. from the floor. The roof is a collar-beam roof with tie rods leading down to the feet of the principals. It is 16 ft. from the floor to the ceiling along the centre of the room. The floor is especially constructed of Dennett's arching to ensure freedom from vibration as much as possible.

**East Block.**—The rooms on this floor are a

dining-room, pantry, and study for the superintendent, and an office from which a door leads directly into the main laboratory.

**Second Floor, West Block.**—The rooms on this floor (which it is hardly necessary to give a plan) are 10 ft. high. The staircase and passage are the same as on the first floor. On the north side of the passage is a lavatory, 16 ft. by 8 ft., for the convenience of workers in the laboratory, and a private workroom, 16 ft. by 12 ft., while the whole of the south side is occupied by the library, a room 30 ft. 6 in. long and 16 ft. wide.

**Second Floor, East Block.**—This floor is occupied by bedroom accommodation, &c., for the superintendent and his servant. A small staircase, 2 ft. wide, will lead from the second floor on to the flat roofs of each block.

As we have already mentioned, the general arrangement of the building is due to Prof. Lankester; the details have been carried out by Mr. J. C. Inglis, engineer, of Plymouth; and the design of the "front" was supplied from the War Office.

#### THE METROPOLITAN BOARD OF WORKS AND THE LONDON SEWAGE.

LIEUT.-COL. JONES, V.C., has sent us a copy of the charges of irregularity of procedure which he and Mr. Bailey Denton make against the Metropolitan Board of Works in connexion with the London sewage question. These charges were submitted on the 4th of May last to Lord Herschell, the Chairman of the Royal Commission now inquiring into the affairs of the Metropolitan Board of Works. Of course, it is no part of the Commissioners' duty to go into technical matters or into the merits of any particular scheme of sewage disposal, and though Lord Herschell may not wish to get involved in any questions of that kind, the charges are sufficiently serious to merit some attention. They are regarded by many people as being within the terms of the reference to the Royal Commission, which was appointed to "inquire into and report upon the proceedings of the Metropolitan Board of Works, and into irregularities alleged to have been connected therewith." The following are the charges:—

**Firstly.**—In the publication of reports setting up, as sufficient guarantee to justify a large expenditure, a very qualified and guarded statement obtained from four eminent chemists in return for a fee of 500l. for witnessing certain limited experiments instituted by the Chemist of the Board, and thus conveying to the Metropolitan ratepayers false impressions bearing upon the most important matter committed to the Board, i.e., the purification of the River Thames.

**Secondly.**—In withholding from the ratepayers and from the public generally, the opinion of one of the Members of the Board, specially possessed of chemical knowledge,† applied by him to a branch of this subject, and, inferentially, condemning (in December, 1887), the course pursued by the Board in the expensive experiments adopted by them at the outfalls.

**Thirdly.**—In like manner withholding from the ratepayers, up to the present date,‡ the unfavourable reports of Sir Henry Roscoe, F.R.S., M.P., made after he had been appointed, in May, 1887, the independent referee, and, subsequently, Consulting Chemist of the Board.

**Fourthly.**—In refusing to entertain or discuss two different tenders from the undersigned, whose evidence before the Royal Commission on Metropolitan Sewage Discharge had been pointedly commended to the notice of the Metropolitan Board of Works by that high authority, as indicating a permanent remedy for the polluted condition of the river, and the docks, wharfs, and other riverside premises, without even ascertaining the probable cost of such permanent remedy. And,

**Fifthly.**—Your petitioners allege that the determination of the Metropolitan Board of Works to carry into effect their scheme for the removal of the sludge from the outfalls, and for transporting it in specially-constructed steam vessels to the sea, in the neighbourhood of the Nore (from whence it may reach Margate, and other seaside resorts, to their great detriment) is opposed to the general opinion of all sanitary authorities, whilst the ex-

\* Between these two blocks comes the roof of the main laboratory on the first floor.

† Mr. E. Rider Cook.

‡ That is, up to the 4th of May, when these charges were sent in to Lord Herschell's Commission. Sir Henry Roscoe's reports have since been only communicated officially, we believe, to the members of two of the metropolitan vestries, those, namely, of Lambeth and Kensington, and not to the Press at all. But, thanks to Mr. Charles Hancock, F.R.S., a member of the Kensington Vestry, we were enabled a fortnight ago (see *Builder*, July 14, pp. 25-26) to publish the full text of several of Sir Henry Roscoe's reports.—Ed.

penditure of large sums of money chargeable to the ratepayers for this purpose is contrary to reason, and constitutes an irregularity which ought to be restrained.

(Signed) A. S. JONES.  
J. BAILEY DENTON."

These are serious allegations, and seem to us to demand inquiry, either by the Royal Commission now sitting, or by some other authority.

#### THE UNEMPLOYED AND THE POOR LAW

A CONFERENCE of metropolitan Poor Law Guardians was held on Monday in the board-room of the City of London Union, Bartholomew-close, "to consider the question of the practicability, by means of the Poor Law, of adapting workhouse administration in the metropolis and larger centres to the education and training of able-bodied men in country pursuits in order to fit them for agricultural life in England or the colonies." The Hon. and Rev. Canon Legge, M.A., chairman of the Board of Guardians of the Lewisham Union, presided. The discussion was opened by the Rev. S. A. Barnett, vicar of St. Jude's, Whitechapel, and a member of the Whitechapel Board of Guardians. He maintained the existence of a large army of unemployed was both a disgrace and a danger, and contended that the obvious course for leaders or guardians to pursue was to put the workless workers on the unworked lands. An agricultural training farm, a technical school in land work, a workfield as a supplement to the workhouse were the first necessity. The persons selected for employment would be able-bodied men, such as seemed likely to be both able and willing to profit by the training to be given on the farm. They would receive board and lodging, and be credited with a small wage payable at the expiration of the stay on the farm. Admission would only be offered to men for whose wives and families support was assured in town, and the length of stay would be at the discretion of the superintendent; but to those who proved efficient, the offer would be made of a fixed tenure of land in England or of emigration to the colonies. Such was the bare outline of a scheme which was obviously open to many developments, but for it the claim was set up that it was practicable, and met the necessities of the case. He concluded by proposing a resolution, in which the conference were asked to recognise the fact that there are in London a large number of unemployed and unskilled workmen, and to express the opinion that unproductive land existed at home and in the colonies which labour might make productive; that it was desirable to find some means of applying the labour to the land, and that such means must be directed by the Poor Law, and supplemented by voluntary effort. The Rev. Brooke Lambert seconded the motion. Mr. A. G. Crowder (St. George's-in-the-East) proposed an amendment, expressing the opinion of the conference that the proposal was impracticable. Though he was opposed to Mr. Barnett's proposal, he was prepared to admit that some change was required in the treatment of able-bodied men by the Poor Law, and he thought there should be an extension of what might be called the Modified Workhouse-test Order lately issued to the Whitechapel Union by the Local Government Board. Mr. W. M. Acworth (Wandsworth) seconded the amendment. The discussion was continued by Mr. Fletcher (Hampstead), Mr. White (City of London), Mr. Monson (City of London), Mr. Hazell, Captain Gretton, the Rev. Llewellyn Davies (St. Mary-lebone), Mr. W. Brown (Lewisham), Mr. T. Catmur (Whitechapel), the Rev. Mr. Spencer (Shoreditch), the Rev. E. C. Hawkins (St. Bride's, Fleet-street), Mr. Wall (Chelsea), Mr. Thacker (Mile-end), the Rev. W. Hamilton, Colonel Grubb (Woolwich), Mr. Bannister, Mr. W. Vallance, and Mr. Allen (St. Pancras), the latter gentleman expressing his belief that during the autumn the committee in connexion with the Mansion House Fund would be able to make a start in some such scheme as that which Mr. Barnett had proposed. He, therefore, thought it would be best for the guardians to wait and see the result before they departed from the principles of the Poor Law. Mr. Barnett, having replied, the chairman put the amendment, which was lost,—eight voting for, and sixteen against it. Mr. Catmur then proposed, and the Rev. E. C. Hawkins seconded, the following resolution, which was understood to be accepted by Mr. Barnett:—"That this conference is of opinion that it is desirable to appoint a committee to inquire into the prac-



ticability of applying the surplus labour of this metropolis to unproductive land at home and in the colonies, and the desirability of carrying out a scheme for this purpose under the direction of the Poor Law, and to report to a future conference." The resolution was declared carried, twenty voting for, and two against it. —*Times*.

### Illustrations.

#### WINDOWS EXECUTED FOR RADWINTER CHURCH, SAFFRON WALDEN.

OUR illustration represents two two-light stained-glass windows, forming portion of a large series of windows in which the principal events from the Old and New Testaments are illustrated. The windows are treated principally in tones of whites, and the colours where used are tertiary and neutral, with a great variety of stains. The quaint old-fashioned wording of the texts was selected from a very old Bible by the vicar. The windows were designed and carried out by Messrs. Gibbs & Howard, of London.

#### THE BUILDINGS FOR THE "FACULTÉ DE MÉDECINE," PARIS.

THE present buildings for the Faculté de Médecine, of a portion of which we give a view in the present number, were commenced some years ago, from the plans and under the superintendence of Mr. Paul Ginain, to replace the buildings constructed in 1769-80, on the site of the ancient Collège de Bourgogne, for the Académie de Chirurgie. This building, which has been for a long time insufficient for its purpose, replaced the École de Chirurgie, which stood on the site now occupied by the cole National des Arts Décoratifs. The École de Médecine, a distinct institution from the last-named, was situated behind the Hôtel Dieu in the Rue de la Bûcherie, at the corner of the Rue Colbert, where are still some remains of the old buildings, especially a circular reception-room, which is threatened with destruction whenever the metropolitan railway is made.

The "Nouvelle Faculté" includes two groups of buildings, separated by the Rue de l'École de Médecine. The first, situated between this street and the Boulevard St. Germain, is devoted to the administration, the library, the anatomical museum, and the department of theoretic instruction in chemistry and physics, &c. The second group of buildings, devoted specially to the practical school of medicine and surgery, occupies the space between the streets of l'École de Médecine, Antoine Dubois, Racine, and Monsieur le Prince. It includes the professional laboratories and all services in connexion with practical anatomy, dissection-rooms, theatres, &c., and the museum of pathological anatomy.

The façade of which we give a view is that towards the Boulevard St. Germain. The new design has a certain reference to, or reminiscence of, that of the existing École de Médecine. As will be seen, it is in a very severe style—much more so than would be approved of at present in this country; but it has, at all events, more architectural dignity and refinement than our last medical building on the Thames Embankment.

#### THE STEEPLE OF ST. MARY-LE-STRAND.

As various foolish persons have been clamouring for the removal of the Church of St. Mary-le-Strand, it seems opportune to put on record a measured drawing of its graceful steeple, as a practical protest against its removal, or a memorandum of it if it should be removed, which, however, we think public opinion of the better sort will hardly permit.

The church was built from the designs of Gibbs in 1714-17. The details, of course, are in the taste of the time, and are not to be altogether defended, but the general design is very good.

The steeple is drawn by Mr. Thos. J. Ketchlee, from measurements by himself and Mr. J. Hutchings.

#### ILLUSTRATIONS OF THE FORTH BRIDGE.

WE give two illustrations showing the recent progress of the Forth Bridge work, reproduced from photographs kindly lent to us by Mr. B. Baker from the extensive collection of photographs of every stage of the work which the



engineers have been making since the commencement. These photographs date about eleven weeks back.

The first view gives a very good idea of the appearance of the whole work as it is approached from the south, or Queensferry side, of the Forth, with the three enormous piles known as Queensferry pier, Inchgarvie pier, and Fife pier, standing in a line across the Forth; and the view gives a vivid idea of the immense gap still to be bridged by the cantilevers and the straight bridge in the centre, and some idea of the scale of the work in relation to the surrounding landscape. The second view shows a portion of Inchgarvie pier on a larger scale. At the lower right-hand corner is seen the compression member of the cantilever as far as completed; the end piece shows the change in direction after the junction with the first tension tie. Just above this tube is seen the first tension tie nearly completed, and the stage or scaffold from which it is built, and which is supported on it and shifted down with it as the work proceeds. The reader should follow this member with his eye up to the junction with the top of the vertical tubes, and realise that this member has been built downwards, from that point to its junction with projecting cantilever tube, from the platform which is now seen on the lower part of the tie, and which has been moved downwards by shifts as the work proceeded. To the right, at the top of the picture, can be made out the figures of two men in the act of sliding down steel wire ropes on to the platform seen at the top of the vertical cross-braced pillar, and these shadowy figures will give the scale of the structure. The upright on to the top of which the men are descending is no part of the permanent structure, but is one of the temporary pillars shown in our diagram published in the *Builder* for February 11 of this year, and which are built up to give support to the top members of the cantilever until it is carried out to the point where the first tabular strut from the lower member will support it. This strut is seen half-completed in the large-scale view. The second strut would be built from the foot of the tension tie, not yet attached in this view; in the general view the commencement of one of the second struts may be seen on the left hand, or north side, of the Queensferry pier.

At the top of the large-scale photograph is seen the commencement of the top member of the cantilever hanging out into the air. At the top of the two main vertical tubes are seen two of Mr. Arrol's rivetting cages, which have also moved up, supported on the tube, as the work went on. The oblique tube at the bottom left-hand side of the picture is one of the great

cross-bracing tubes between the uprights, the ends of the two others are seen at the top. The Inchgarvie pier is a great deal wider between the vertical members than the two other piers, having to take two cantilevers with no support on *terra firma* at either end, and therefore a broader base was considered desirable.

We hope the illustrations, though we admit they are not architecturally beautiful, will serve to give to those who have not seen the work a better idea of its scale and extraordinary character than mere words can convey.

We may mention, in connexion with the subject, that Messrs. Grant & Son, of Princes-street, Edinburgh, have on sale a considerable collection of photographs of the bridge in various stages of its progress, of which they have sent us some very good specimens; they also publish a pamphlet giving what seems to be a good popular account of the work.

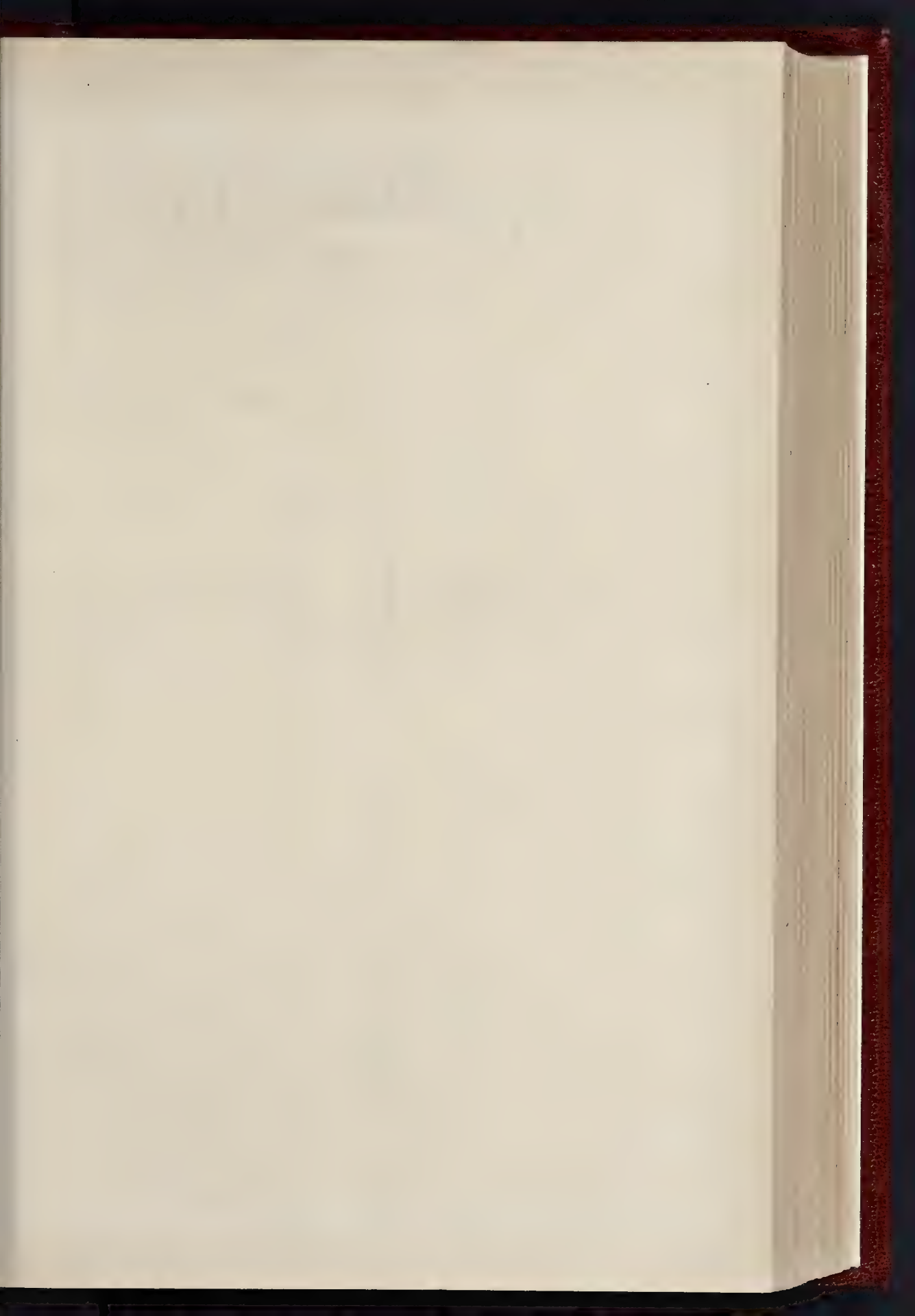
#### OLD HOUSE, BAIL GATE, LINCOLN.

FOR this sketch of a picturesque old house at the corner of a street in Lincoln we are indebted to Mr. F. D. Bedford.

#### ABOLITION OF THE JURISDICTION OF AN ANCIENT COMMISSIONER OF SEWERS.

THE powers of the Honourable the Havering and Dagenham (Essex) Commissioners of Sewers, so far as relates to the Borough of West Ham, have been transferred to the Corporation of that borough. The Commission dates from the time of Henry VIII., and had control of the ditches and river walls along the Essex Marshes, from Walthamstow to Rainham Creek. The newly-constituted Corporation of West Ham (1886), feeling that the powers of the Commissioners were inconsistent with the changed circumstances of the district, promoted a Bill in Parliament to extinguish their powers within the limits of the borough. The Bill was strongly opposed by the Commissioners, who contended that such a proceeding was without a precedent in Parliament. The matter was fought for several days before the Select Committees of the Commons and Lords. On behalf of the Corporation, engineering evidence was given by Messrs. Lewis Angell (Borough Engineer), Sir Robert Rawlinson, Sir Alex. Rendel, and the engineer of the Lea Conservancy; and on behalf of the Commissioners by their engineer, Mr. Barnes, and Mr. Abernethy. In the result, both the Lords' and Commons' Committees passed the Bill abolishing the powers of the Commissioners within the Borough of West Ham.



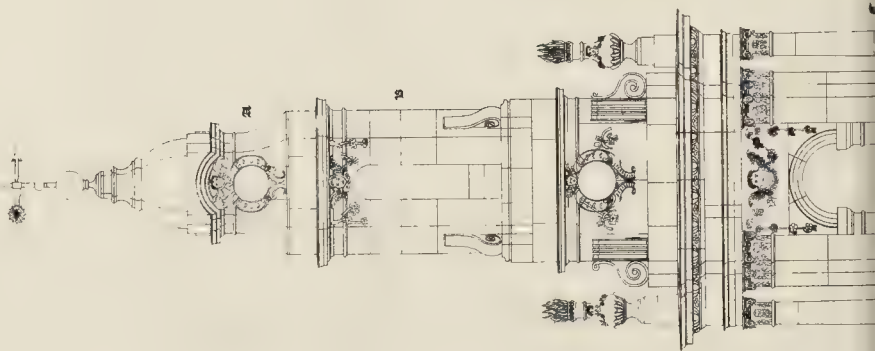
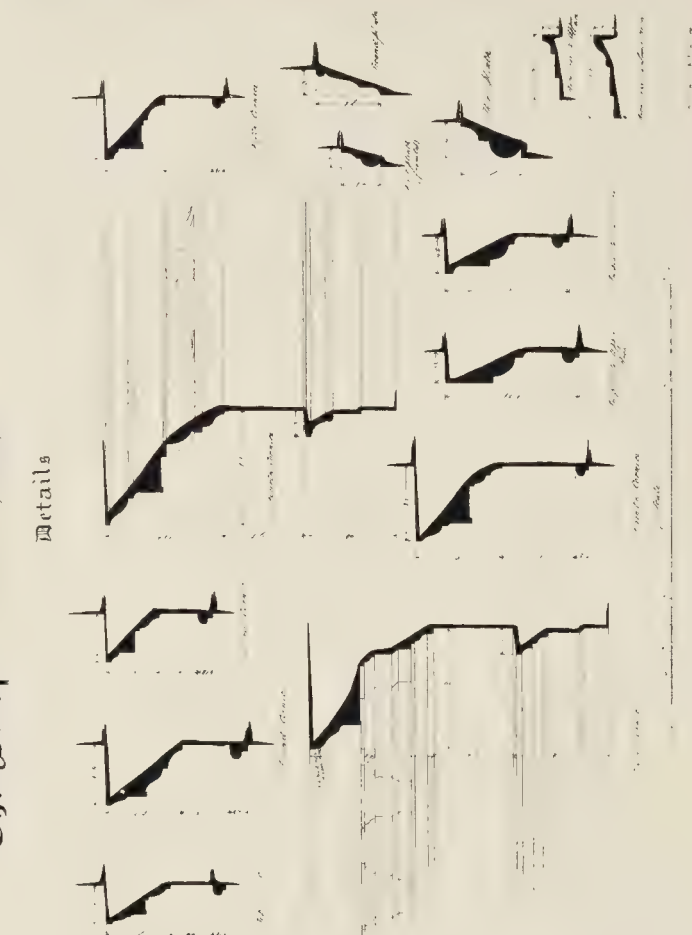


# Church of S. Mary-le-Strand

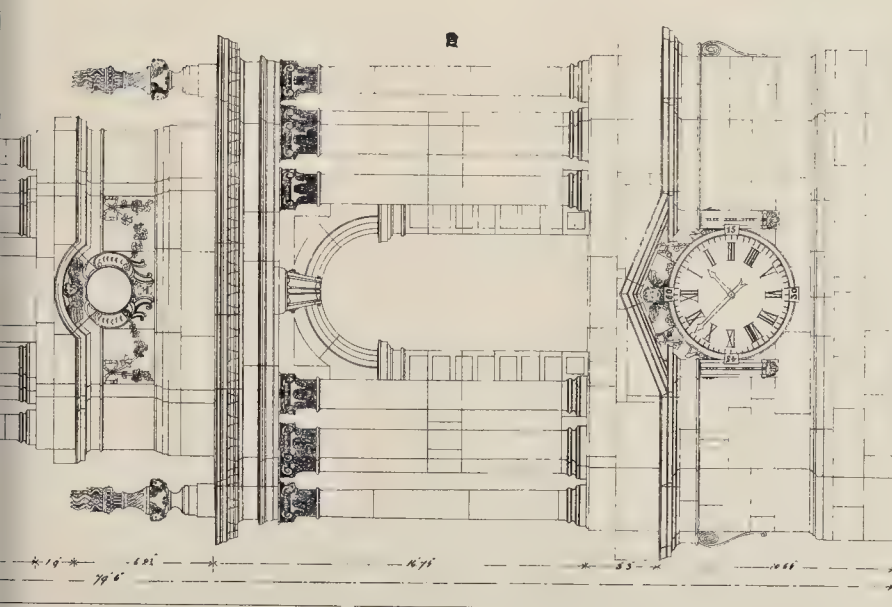
The Steeple

DESIGNED BY  
J. H. STUBBS

## Details





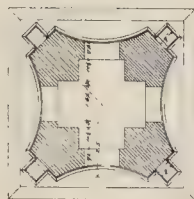


West Elevation

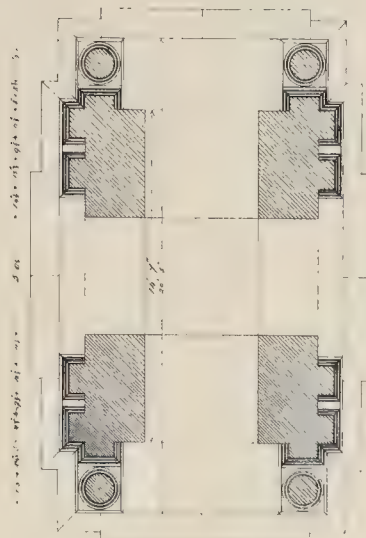
Scale of feet and inches



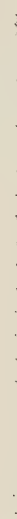
Plan A



Plan B



Plan C



Plan D

Scale of feet and inches

PHOTO LITHO. MURRAY & SONS, 22, MARK LANE, LONDON, E.C.



Rejoyce I have founde my shepe



The sower wente out to sow



My sonne was loste and is founde

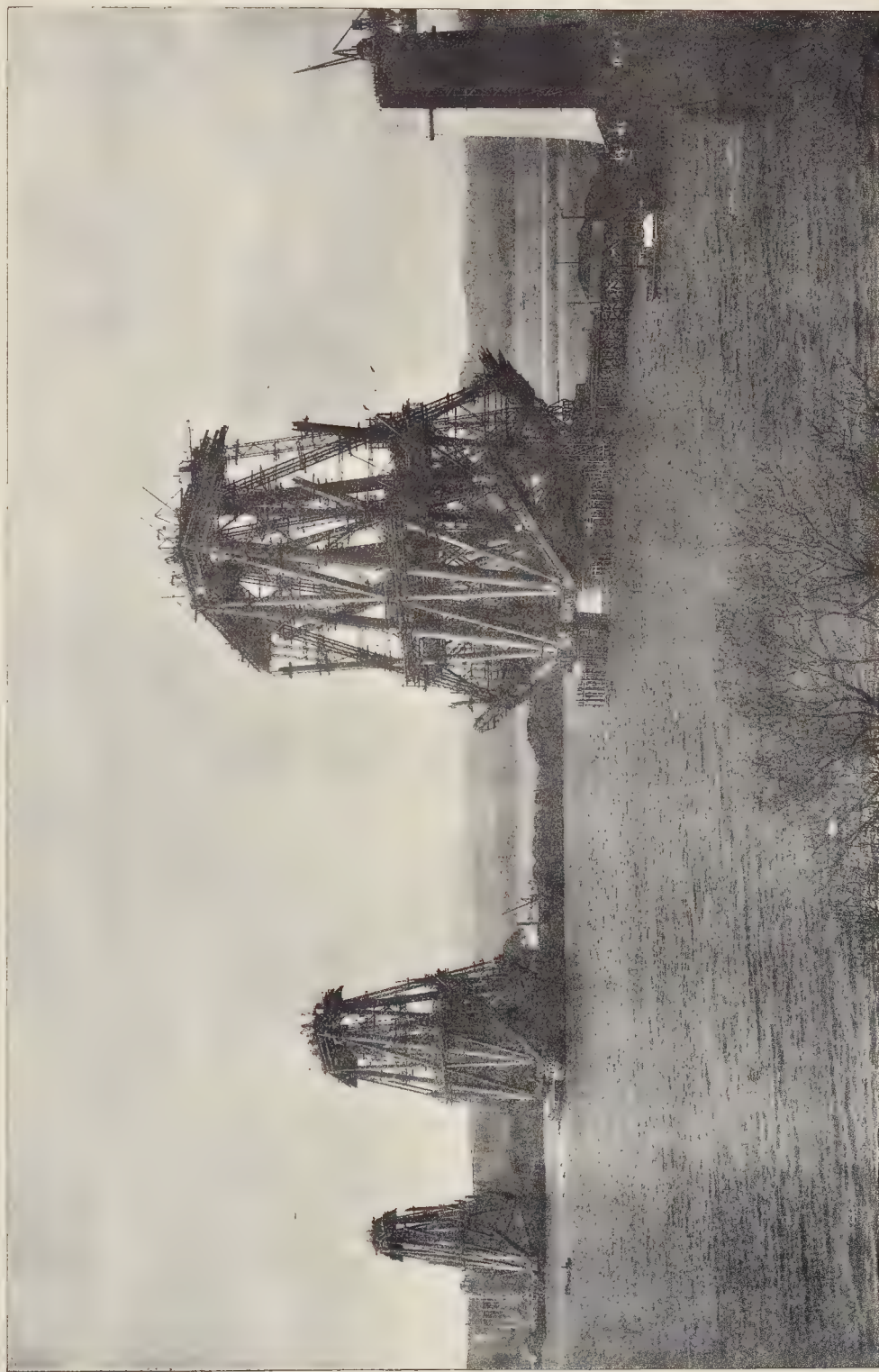


She sebeth for ye lost grete





THE BUILDER, JULY 28, 1886.





THE BUILDER, JULY 26, 1966.



THE FORTH BRIDGE: INCH-GARVIE NORTH CANTILEVER.







He gave ye breade to ye disciples.



He cryed Lazarus come forth.

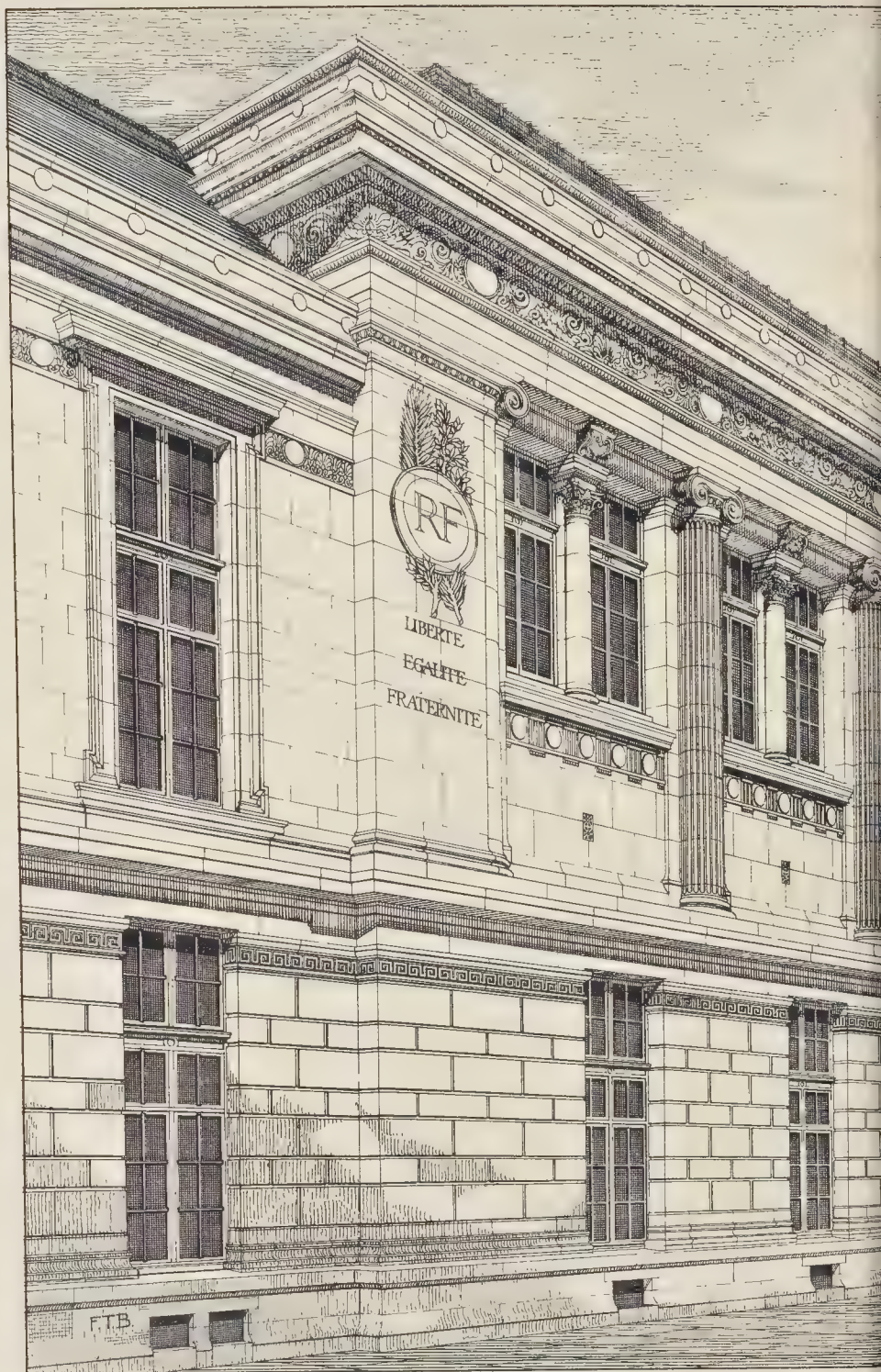


Jesus wente walkinge on ye see.



Ye marryage in Cana of Galyle.





NEW BUILDINGS FOR THE FACULTÉ





PHOTO. L. THOS. SPRACE, & CO. 25, MARK LANE, LONDON, E.C.





# LANES, COURTS, AND BACK STREETS IN OLD CITIES AND TOWNS, EXEMPLIFIED BY THOSE IN CARLISLE.\*

THE City of Carlisle is one of the most ancient towns in the kingdom. The earliest charter on record was granted by Henry II., and there is a regular series of charters from that date down to the reign of Charles I. Eight lines of railways converge on Carlisle. The area of the city is 2,029 acres. The population is estimated at upwards of 40,000. The rateable value of the city in 1877 was 107,151*l.*; it is now 152,332*l.*, showing an increase of over 42 per cent.

The city is built on the main west road from England to Scotland, and is almost surrounded by the rivers Eden on the north and the Caldew and the Petteril on the west and east sides of the city, the two latter rivers being only three-quarters of a mile apart at the south of the city.

A glance at John Speed's map, taken from his "Book of the British Empire," published in 1610 and reprinted in 1676, shows that the King's highway from north to south, and the road to the west, formed the principal streets in the city at that time. All the houses abutted on these highways, with extensive gardens running from the houses to the city walls. No such thing as a court is shown on the plan, and only a very few narrow secondary streets and lanes from one main road to another.

It would appear from Speed's map that formerly the city elongated itself on its main thoroughfares in the same manner as I have read that some of the cities in China are built. This must have been an advantage for the inhabitants, as they would be in touch and sight of all that passed through the city, or had business in it. Then again, the gardens would give abundant air space.

The author exhibited a small plan of the centre of the city, showing the amount of open space the inhabitants enjoyed in 1610, as compared with the small portion of open space now left, and from which it was observable that the amount of open space at the time when Speed's map was made was over fourteen times greater than the houses, and that now on the same site there are only 292 square feet of open space for thirty-eight houses, or buildings that have been used for houses, giving an average of only 7.68 square feet per house.

These lanes contain stables, second class public houses, beer-houses, lodging-houses, labourers' cottages, cottages converted into warehouses, and, until a few months ago, almost all the slaughter-houses were in them, and generally placed at the end where the lane is a *cul-de-sac*. The lanes are over-crowded, unventilated, and often have in them back-to-back houses, or, at most, a small space exists of 15 to 18 inches wide for eaves' drop between the two properties, on the bottom of which is frequently deposited rubbish of a very objectionable and insanitary character.

These lanes and courts are principally occupied by hard-working labouring men, who ought to have the greatest possible amount of air space, instead of being compelled to crowd together until they have no pure air to breathe, and who must return to their work in the morning unrefreshed, and greedy to fill their lungs with a purer air than that breathed through the night.

During the last epidemic of fever in the city—in 1874—Mr. Power, Local Government Board Inspector, found that typhus located itself in forty-two lanes, courts, and narrow streets, and one broad street, with back-to-back houses in it and courts behind approached by narrow, built-over passages from the street.

Annet-square, at the north of the city, and East-street (a *cul-de-sac* approached from Botchgate by a covered archway at the south), are the localities where typhus first established itself, and these two places to the north and south of the city, and half a mile apart, are the two places the fever radiated from in various directions. It is true that since 1874 improvements have been made in these lanes and courts, but still the lanes and courts are the most favourable fever-breeding places in the city, and they are always more or less unhealthy, and during an epidemic of fever it spreads from them through the city.

Now, if circumstances had allowed the city to develop itself, by following the plan of

building houses abutting on the highways through the city only one deep, there would not have been such a great want of open space as at present; but being a fortified city, it must needs make room for the increase of its population by crowding buildings on the gardens and open space within the city walls, and unfortunately, until the first Public Health Act was applied, following the same plan outside the city walls. The courts and lanes are a legacy left to the city that is not favourable to its healthiness. It is neither right, humane, wise, nor profitable to any city or town to have these confined lanes and courts crowded with inhabitants, and to neglect to help them.

The courts and lanes in Carlisle vary very much in their character and the number of inhabitants; they contain from two to upwards of thirty tenements. The front streets have courts and lanes at the back of them in every respect similar in construction, some of which are kept very clean and in a good sanitary condition, and are occupied by good tenants, whilst others are in a dirty, uncared-for, insanitary state, and it is almost impossible to walk up the alleys or passages of the latter lanes and courts without stepping into excrement and all manner of filth. As may be expected, the inhabitants, as a rule, in these insanitary courts are undesirable tenants in every sense of the word. Should an epidemic of fever or cholera at any time occur, it would be difficult to free the city of it if these insanitary courts and lanes remain in their present neglected condition. The sanitary state of these courts and lanes undergoes considerable temporary improvement when the owners and tenants are afraid of a threatened epidemic, but after the scare is over they are soon in as bad a sanitary condition as ever.

Almost invariably when the owners live in the neighbourhood and look after their own property, or give full power to their agents, the courts and lanes are kept in as good a sanitary state as it is possible with their limited air space to keep them; but when the owners are non-resident, and their agents are not empowered to do anything but receive the rents, the properties are in an uncared-for condition throughout; the houses, gullies, water-closets, surface of court, and everything else, are uncleansed, and often considerably out of repair. The Old North and South Roads have seventy-four lanes and courts leading out of them, with an average population of fifty-six in each lane or court. The Old West Road has forty-four courts and lanes leading out of it, with an average population of thirty-eight in each lane or court. The Old East Road has nine courts in it, with an average population of forty in each court. These roads are the principal thoroughfares and business streets at the present time.

The comparative population in the main roads through Carlisle, and in the lanes and courts from them, is as follows:—The Old North and South Roads have only a population of 26 per cent. of that of the lanes and courts leading out of them. The Old West Main Road has only a population of 58 per cent. of that in the courts and lanes leading out of it. The Old East Road has only a population of 66 per cent. of that of the courts and lanes on it. The average population in the old main roads is only 48 per cent. of the population of the lanes and courts leading out of them. The remaining streets in the city having courts and lanes leading out of them have a population of 156 per cent. of that of the courts and lanes in them. The average population of all the front streets in the city having courts and lanes leading out of them is only 97 per cent. of that of the population in the courts and lanes in them.

The total number of streets, lanes, and courts in the city which have houses in them, is 669, of which 271 are front streets, 300 lanes and courts without thoroughfares, and 98 lanes and courts which are thoroughfares, or say 40 per cent. of front streets, 15 per cent. of lanes and courts with thoroughfares, and 45 per cent. courts and lanes without thoroughfares.

There are 84 front streets (or 31 per cent. of the front streets) which have courts and lanes leading out of them, and in these 84 streets there are 398 lanes and courts. There are also 38 back streets which have only the rear of houses abutting on them, and which make the number of private back streets, lanes, and courts 436. The population of the lanes and courts and back streets is 13,218, being one-third of the total population of the city.

Municipal engineers and surveyors should do all they can to do away with these dwellings, unfit for human habitation, in courts and lanes,

because if they are allowed to remain they will be a source of trouble and danger to the health and moral condition of the cities and towns in which they exist.

## THE GREAT NORTHERN CENTRAL HOSPITAL.

THE first portion of the buildings for this hospital, situate in the Holloway-road, between Manor-road and Grove-road, were opened about three months ago for the reception of patients, and they were formally opened by the Prince and Princess of Wales on the 17th inst. They constitute about one-half of the complete hospital, and comprise three wards, a portion of the administration department, the out-patients' department, and the mortuary. The wards are placed in a three-story pavilion, and accommodate twenty patients each. Attached to the wards on each floor are a ward kitchen and small ward for one bed; also stores for food, clothes, linen, &c. Each ward is 87 ft. 9 in. long, 29 ft. wide, and 13 ft. 6 in. high; total area, 2,552 ft.; total cubic space, 34,354 ft. The wall space per bed is 8 ft. 6 in.; floor area per bed, 127 ft.; cubic space per bed, 1,614 ft. 6 in. The chief means of ventilation are the windows, which are placed alternately with the beds on each side of the wards. In addition, air gratings are provided close to the floor level at the back of each bed, and extraction shafts are taken up alongside the smoke-flues from the upper part of each ward. Each ward is warmed by two pairs of Boyd's Hygienic grates, set back to back in the centre of the ward, and having descending flues which run in the thickness of the floor to the outside walls, where they ascend. Two rows of hot-water pipes run around each ward to aid in warming when necessary.

The water-closets, bath-rooms, lavatories, &c., are placed in a projecting building, connected to the wards by low covered-in bridges, provided with cross ventilation.

The floors throughout the ward pavilions are constructed of fire-proof materials. The ward floors are laid with oak blocks, wax polished. The roof of the ward pavilion is flat, and paved with asphalt; it will be used as a promenade for patients. Patients will also be enabled to take the air on the covered balconies at the ends of the wards.

The administration block comprises secretary's office (temporary), stores, dining-rooms for nurses and staff, surgery, rooms for resident staff (temporary), board-room (temporary), operating theatre with rooms adjoining, kitchen offices, and servants' dormitories. There are two lifts for food and coals, and a passenger lift, all of which are worked by hydraulic power. The kitchen is fitted with gas and steam-cooking apparatus.

The out-patient department is an entirely separate building, one story only in height. It consists of a large central waiting-hall, around which are grouped smaller waiting-rooms for new patients; four consulting-rooms, each with its private room attached; a dark-room for ophthalmoscope work; and a dispensary, with waiting-room attached, drug stores, &c.

The mortuary building contains a dead-house, mortuary chamber, *post-mortem* room, pathologist's room, and small museum.

The cost of the buildings when completed (omitting out-patient department) will be, for 150 beds, about 260*l.* per bed; and of the furniture, as far as at present completed (except the out-patient department), about 30*l.* per bed. The architects point out that in looking at the cost of the building per bed, it must be remembered that of the total number, more than thirty will be in single rooms, an arrangement which greatly increases the relative cost, as compared with hospitals whose wards contain from twenty to thirty beds each.

The following figures, supplied by the architects, will show that the cost of this hospital is by no means extravagant:—Herbert (Woolwich), 330*l.* per bed; Blackburn, 286*l.* per bed (including out-patient department); Leeds, 298*l.* per bed (ditto); St. Thomas', 969*l.* per bed (ditto); Edinburgh, 477*l.* per bed (ditto). With the exception of Edinburgh, the figures given are all upwards of twenty years old, and as the rise in prices cannot be taken at less than 20 per cent., the comparison

\* From a paper by H. U. McKie, M. Inst. C.E., City Surveyor of Carlisle, read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, recently held in London.





New Church, Club, &c., for the Parish of Holy Trinity, Bethnal Green.  
Mr. R. J. Lovell, A.R.I.B.A., Architect.

is the more favourable to the Great Northern Central Hospital.

The architects of the hospital are Messrs. Young & Hall; and the builders are Messrs. Brass & Son.

We gave a view and plan of the complete building in *The Builder* for Dec. 25, 1886.

#### New Wall-paper Printing Machine.

A Danish engineer, Herr S. Hansen, has invented a machine for printing various colours on wall-paper simultaneously, instead of, as is now the case, only one colour at each impression. The secret of the process is retained by the inventor, who has obtained a ten years' patent right for his machine.

#### THE CHURCH OF HOLY TRINITY, OLD NICHOL STREET, BETHNAL GREEN.

This building is being erected for the parish of Holy Trinity, Bethnal-green, and is the commencement of a scheme proposed to be carried out by the Vicar. It contains on the ground-floor a club-room, about 45 ft. by 30 ft. for the use of the men of the parish, with a platform at one end. A caretaker's room, with bed-room, &c., attached, is also on this floor. On a mezzanine floor are vicar's rooms, and upon the whole of the first floor is the church, which is approached by a stone staircase 4 ft. by 6 ft. wide. The basement contains a large gymnasium about 45 ft. by 30 ft., and 14 ft. high, and in the front portion are kitchen,

stores, &c. The construction is fire-proof throughout, on Messrs. Homan & Rodgers' system. The club-room, which is 20 ft. high, will have a dado of glazed bricks, and picked stocks above. The floors throughout will be covered with pitch-pine blocks. The foundation-stone was laid on Saturday, the 7th inst. by the President of Magdalene College, for and on behalf of H.R.H. Princess Christian, who had promised to perform this ceremony, but was prevented by the Court being in mourning. Magdalene College has been a liberal subscriber to the funds, and sustains a successful mission in connexion with the church and parish. Messrs. Perry & Co., of Bow, are carrying out the work, under the direction and superintendence of the architect, Mr. Richard J. Lovell, A.R.I.B.A.

#### THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION:

##### FURTHER EVIDENCE.\*

MR. EARLE BIRD, examined by Lord Herschell, the Chairman of the Commission, said he was the owner of an estate in Albany-road, Camberwell. He entrusted the laying-out of the estate to Mr. Robert Evans, a surveyor, whose plan, showing the proposed roads, was sent in to the Board for approval. But there were difficulties in getting it passed by the Board, so witness employed Mr. Fowler and Mr. Saunders, members of the Board, to advise him in the matter. He asked Mr. Fowler to overhaul the whole of the plan, and to ascertain why it had been rejected. Mr. Fowler made a tracing showing a proposed alteration in the plan. Ultimately the plan was passed. Mr. Saunders made no plan. Witness paid Mr. Fowler 50*l.* and Mr. Saunders fifty guineas, for "he considered they had done him good, and enabled him to pass his plans." He employed Saunders "to make the thing thoroughly safe."

Mr. Frank Hards, an auctioneer and surveyor, of Greenwich, was next examined, and substantially admitted the correctness of the evidence given by the witness Bird, an employé of the Board, as to their joint speculations in lands subsequently acquired by the Board for public purposes.

Mr. Frederick Gordon deposed that he tendered in 1877 for the plots in Northumberland-avenue upon which the Grand Hotel now stands, and he and his co-partners, Mr. Alexander Gordon and Mr. Davies, afterwards obtained an agreement from the Board with regard to that land. No one else was interested in that agreement at that time, but it was afterwards assigned to the Grand Hotel Company, or, rather, to another company at first, which afterwards became the Grand Hotel Company, of which witness was Chairman. Mr. Saunders was jointly employed as architect with Messrs. F. & H. Francis. The next site which he (witness) took was that on which the Hôtel Métropole is built. He was also chairman of the Hôtel Métropole, Limited. Messrs. Francis and Mr. Saunders were also joint architects of that building. Witness purchased the freehold of the site of the Hôtel Métropole at twenty-six years' purchase, and afterwards sold it for twenty-eight years' purchase, making a profit of two years' purchase, or 12,000*l.*, which went into the assets of the Métropole Company. No one connected with the Board of Works received a sixpence of that profit. Cross-examined by Mr. Winch, Q.C., for the Inquiry Committee, witness said that he and his partners had built the Holborn Restaurant, the First Avenue Hotel, Holborn, and the Royal Forest Hotel, Chingford. The latter was built on property belonging to the Corporation of London. Neither the Holborn Restaurant nor the First Avenue Hotel were built on land belonging either to the Corporation or to the Metropolitan Board of Works, and for neither of these two buildings was Mr. Saunders employed as architect, but he was consulted with regard to questions of light and air in connexion with each of them. He found that the sum of 7,128*l.* 17*s.* 6*d.* was paid to Messrs. Francis and Saunders by way of professional charges due to them as architects of the Grand Hotel. Saunders presumably got half that amount. Did not know how much work Mr. Saunders did with regard to the plans of that building. Witness had nothing to do with

\* For summary of previous evidence see *The Builder*, pp. 5, 44, ante.

† See *Builder*, p. 45, ante. At the last meeting of the Board, Brady was dismissed.



Mr. Fowler in the matter. With regard to the Hôtel Métropole, the payments to the architects amounted to 2,867l. Mr. Grenfell, one of the Commissioners, asked whether this sum went half to Saunders and half to Messrs. Francis. Witness replied in the negative, and explained that there was a considerable difference in the way in which the Grand was erected and the way in which the Métropole was erected. Witness and his co-partners were practically their own builders in the case of the Métropole. They employed a very able clerk of the works, any they themselves purchased the whole of the material required in the erection of the building. They, therefore, considered that, under the circumstances, the architects were not entitled to the same rate of remuneration as they would have been entitled to had they had the entire responsibility of superintending the erection of the building by an ordinary contractor. Therefore, witness and his co-partners only paid to the architects what appeared to be a very much smaller sum in comparison with that paid in connexion with the building of the Grand Hotel, although the Métropole, of the two, was the more expensive building. The 2,867l. was to be divided between Saunders and the Messrs. Francis, with the exception that there was 52l. 10s. paid to Saunders in connexion with the assessment, for going before the Assessment Commissioners with regard to the assessment for rating, and also a separate fee of 150 guineas paid to Saunders for "various interviews and information as regards the site generally" prior to the commencement of the works. Asked what Saunders did for this fee, witness said he measured the site, and added that "there was really a great deal of work done for that money." Witness said he wished to state that, though the transactions in which he had been concerned with the Board had been very large, he had never been asked for anything by any *employé* of the Board, nor had he ever paid anything. Examined by Mr. Bosanquet, Q.C., one of the Commissioners, witness said he believed that Saunders was the first person who introduced the site of the Hôtel Métropole to him. He was certainly the first person connected with the Board who mentioned the matter to him.

Mr. Frederick John Francis, F.R.I.B.A., said that his firm (F. & H. Francis) were architects jointly with Mr. Saunders for both the Grand Hotel and the Hôtel Métropole. The joint employment on the Grand Hotel commenced at about the same time. The plans were chiefly prepared in his (witness's) office, by himself and his assistants. Mr. Saunders, however, did some things in connexion with the plans. They were jointly responsible for the superintendence of the erection of the buildings. A clerk of works was employed, and witness and his brother did the chief part of the work in supervising the erection of the building. Mr. Saunders no doubt went there sometimes, but there was no arrangement that he should supervise one part of the work and witness and his brother the other part. In fact, witness and his brother supervised the work as much as they would have done if there had been no other architect associated with them. His (witness's) appointment as joint architect of the Hôtel Métropole commenced about the same time as that of Mr. Saunders. Asked who prepared the designs for the Métropole, witness said he believed Mr. Gordon asked both witness's firm and Saunders each to prepare an elevation. When the elevations were made, those presented by witness's firm were preferred, and carried out. The internal arrangements were chiefly planned in witness's office, but many of the details were worked out by Mr. Gordon himself. Mr. Saunders assisted in the preparation of the plans, partly at witness's office, and partly by making tracings of drawings sent to him at his own office for the purpose. In regard to the supervision of the erection of the Métropole, witness and his brother took charge of it, though, owing to the special circumstances described by Mr. Gordon, it was only necessary to give partial supervision to the work, and that was the reason why the remuneration was less than in the case of the Grand Hotel. He believed that Mr. Saunders's name, as well as that of witness's firm, was on the plans when they were sent to the Board. Witness's firm had a similar arrangement with Saunders, in regard to halving the professional remuneration in the Métropole, as was made in the case of the Grand Hotel. Cross-examined by Mr. Winch, witness was asked, in reference to the Grand Hotel, whether he received any

material assistance from Saunders in the work. Witness said that was rather an invidious question, but he did not think that Saunders did anything but what he (witness) and his brother could have done just as well. Mr. Saunders certainly did not do very much with regard to the plans of the Grand. Witness thought that Mr. Gordon came to witness's firm first about the Grand Hotel, but he thought he had spoken to Mr. Saunders also. The application to the Metropolitan Board of Works for the land was made by witness's firm at Mr. Gordon's request. When they made application for the land they knew that Saunders was to be associated with them as joint architect. The agreement was that if they applied for the land, and got it, Saunders was to be joint architect. Saunders had been joint architect with them in no other buildings. Examined by Mr. Meadows White, Q.C., senior counsel for the Board, witness said he had never had any transactions with any other member of the Board, nor with any official of the Board. Every interview connected with the plans of the Grand and the Métropole was with Mr. Vulliamy himself.

Mr. George Brick, a builder, gave evidence as to his employment in connexion with property in Lisson-street, Paddington. He said he was instructed by Miss Booth (of the "Salvation Army") the owner of No. 33 in that street to pull down the property. After the house was pulled down, there was an old fissure manifest in the party-wall between what had been No. 33 and the adjoining house, No. 35. There was a notice served on the owner of No. 35 by the then District Surveyor (Mr. Peebles), who was of opinion that No. 35 was a dangerous structure, and who called upon the owner to take down the defective portions of the party-wall in question. The owner of No. 35, and of the house beyond, No. 37, was Mr. Brown, a member of the Metropolitan Board of Works. Witness called on Mr. Brown after the District Surveyor's notice had been served. Brown told witness to mind his own business, and said, "We will see about this in a day or two. I will bring somebody who will see into the matter." A few days later Mr. Brown came with an officer from the Board, Mr. Thomas, of the Dangerous Structures Department. Mr. Thomas expressed the opinion that the fissure in the wall was an old one, and said he thought the wall would "hang together for a long time." He further said that he could not see why it should have been condemned. Witness proceeded, according to the District Surveyor's notice, to shore up the wall, and did so to the satisfaction of the District Surveyor, Mr. Peebles, who, however, seemed rather vexed when he heard that Mr. Brown had brought Mr. Thomas to see the wall, and found that the dangerous parts of the wall had not been taken down by Mr. Brown. Ultimately, the dangerous part of the front wall was shored up by the Board's contractors, Messrs. Greenwood. The shore put up by them was to the front wall of the house, not to the party-wall.

Mr. George James Thomas said he was Superintendent of the Dangerous Structures Department, under the Superintending Architect of the Board. He had been about ten years at the head of that department. He made an appointment with Mr. Brown to see the property in question, as Mr. Brown wished him to point out what should be done in the matter. Witness consulted Mr. Vulliamy before going to see the property. When he had seen the property, he advised Mr. Brown to consult an independent architect, as there seemed to be a likelihood of litigation. He went to the property subsequently in order to see if the work of shoring had been done. If an order on a property-owner to do work of this kind was not complied with, the usual course, when the District Surveyor reported that the work had not been done, was to mark the report for summons. That was done in this instance, and the report was sent to an assistant in the inner office, whose duty it was to make out the summons; but before the summons was made out, Mr. Brown called at the office, and it was then that witness saw Mr. Vulliamy, who requested him to go and look at the premises. He went, and reported to Mr. Vulliamy that though there was a largish fissure in the party-wall at its junction with the front-wall of the house, he thought there was no immediate danger pending the negotiations which were in progress with the "Salvation Army" (who were the owners of No. 33, the house which was first pulled down). Subsequently there was litigation between the parties, and witness was subpoenaed as a wit-

ness. With the single exception of advising Mr. Vulliamy that there was no danger in granting delay, witness had taken no part in the affair, had no interest whatever in it, and had not sought to influence anybody in the matter.

Mr. Frederick Gordon, recalled, said he wished to add to his previous evidence that there was a further sum paid to Messrs. Francis and to Mr. Saunders jointly in respect of the annex to the Grand Hotel, which was built some time after the main building was erected. That sum amounted to 1,400l., being the ordinary architects' commission on the work carried out. Of that sum 700l. would, presumably, go to Mr. Saunders.

We must break off here for the present.

#### TELEPHONE AND STREET FIRE-ALARM COMMUNICATION AT HORNSEY.\*

The importance of connecting by telephone the dépôts, fire stations, and offices of the Hornsey Local Board, was recognised about three years ago, and the first contract was entered into with the General Post Office for connecting the Board's offices and the Central Fire Station by telephone. The wires were carried on poles along the public roads, the distance being about 2,900 yards, and a further extension of the system was undertaken by the Post Office. The poles and overhead wires were very strongly objected to by the residents along the route; and so successfully was the opposition maintained, that the Post Office authorities were unable to obtain wayleave for the intended extension of the overhead system. Therefore the Local Board ultimately resolved (with the consent of the Post Office authorities) to remove the poles and overhead wires, and to lay down a complete system of pipes for telephonic and street fire-alarm purposes.

The pipes were laid by the Local Board, and were of 2 in. cast-iron, with turned and bored joints, weighing 23 lb. per lineal yard, and coated with Dr. Angus Smith's composition. All pipes were carefully tested to a pressure of 130 lb. before leaving the works, and were again tested and examined on delivery at the Board's depot. No variation in weight exceeding one per cent. was allowed. The contract for the pipes was executed by the Staveley Iron Company in a very satisfactory manner, at the rate of 44. 12s. per ton, delivered. The total length of pipe laid was 13,948 yards.

The pipes were laid by contract. The cost for opening ground, laying the pipes at a depth of not less than 2 ft., including red lead used in jointing and filling in, and making good surface, was 11½d. per yard lineal. The price did not include the relay of footway paving or the cartage from the depot.

Examination pits were constructed on the line of pipes at distances of about 100 yards. The pipes were laid, as far as practicable, in straight lines between the pits, and sunk examination boxes were fixed, in most cases midway between the pits, or where a curve or bend occurred. The boxes were of cast-iron, weighing 86 lb. each, and were made in two castings, with turned and bored joints and india-rubber washers. The cost of each box delivered complete was 10s. The brick pits measure in the clear, 2 ft. by 1 ft. 6 in. by 2 ft. 3 in. deep, and were constructed of London stock bricks in cement. The pits were covered with two kinds of cover, one wholly of cast iron for the footway, the other being a stronger casting, with wood-blocks for the carriage-way. The brick pits, including cartage and fixing covers, cost 12. 2s. 6d. each. The covers were supplied by Messrs. Smith, Patterson & Co., the footway covers costing 10s. 6d. each, and the roadway covers 16s. 3d., delivered at Hornsey.

The electrical apparatus, batteries, wires, fittings, &c. (with the exception of the telephone instruments), were provided and fixed by Messrs. Blenheim & Co., the total cost being 519l. 10s. 6d. The wire used was No. 16 B.W.G. copper, of not less than 95 per cent. conductivity, insulated with gutta-percha to No. 7 B.W.G., and braided and ozokerited.

The telephone instruments are of the Gower-Bell type, and were purchased by the Board free of royalty, and, including the three rented from the Post Office and one from the United Telephone Company, number fourteen in all.

\* From a paper by Mr. T. de Courcy Meade, Assoc. M. Inst. C.E. (Engineer and Surveyor to the Hornsey Local Board), read at the recent annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors.



There are three exchange switch-boards, from which the lines branch, and by means of which any point on the system can be connected with any other point. The switch-boards are worked entirely by firemen, who are on duty both night and day. The system is maintained by two exchanges at a time. The switch-boards are made of different sizes, varying according to the number of lines to be dealt with. In each line is placed a coil of wire containing a magnetic needle (very similar to an ordinary needle telegraph). One end of the coil is connected to the line, and the other to a plug. When in position the plug is placed in contact with a horizontal brass bar connected with earth. The magnetic needle is supported on a steel spindle, from which is suspended a small brass disc. One end of the needle terminates in a platinum point, which is suspended immediately over a cup containing mercury. The following is the method of signalling—viz.:—On contact being made by pressing the button of the telephone instrument of a distant station, a current of electricity is sent through the line, and hence the magnetic needle of the particular coil on the switchboard is deflected, and the platinum point dips into the mercury cup as before described. This makes the contact, and a current passes from a local battery and rings the call-bell; the deflection of the needle moves the disc behind a glass panel, and indicates the particular line from which the call is received. The plug, attached to a flexible insulated cord, is disconnected from the horizontal bar and placed in contact with a circular brass plate, which is in connection with the local instrument. A conversation is then held by the telephones in the usual way. Should the persons signalling require to speak to any other branch line outside the switching station, they ask the person on duty at the station to connect them with the third or fourth instrument as required. This is done by placing the plugs on the insulated cord connected with the instruments in one of the single brass plates immediately under the horizontal brass bar.

The Board's telephones are worked by single wires with an earth circuit; the Post Office instruments are worked with a metallic circuit. In joining the insulated wire both skill and care are absolutely necessary, as a badly-made joint might cause much inconvenience. In drawing the wires into the pipes care is also necessary. When the pipes were laid a "lead wire" of ordinary galvanised wire, No. 12 B.W.G., was run through, for the purpose of drawing the insulated wires into the pipes, but when additional or new wires are required, the existing insulated wires can be used for the purpose.

Fire alarms are placed in the streets in convenient positions, and are defined by special lamps with ruby glass. These posts number twenty-three in all, and are fairly dispersed throughout the district. Each post is fitted with a glass panel, which is left to the care of the public, and up to the present time there has been no tampering with the posts, nor has there been a single instance of wilful false alarm of fire. In this respect our system differs from that in the Metropolis, where all posts are placed under the charge of the police at "fixed points." Owing to this deviation from the Metropolitan system, the Board provided numbered keys and master keys to the post locks. By this arrangement an iron panel could be placed in the door in lieu of glass, and the numbered keys served to the residents in the neighbourhood of each post. The keys would, on opening the door of the post, be retained in the lock until released by the fireman's master key, and in this way any false alarms would be detected; but, as previously stated, no false alarms have been received, therefore the glass panels are still in use. The signalling apparatus in the street alarm post consists of a coil of insulated wire of a definite resistance. Seven or eight posts can be placed on a single wire. The coil in the first post offers a resistance of, say, ten units; that in the second, fifteen; the third, twenty, and so on through the whole series. The front of the post is fitted with an iron door and glass panel, inside which is a metal disc, with a projecting knob near the centre. At the back of the metal disc is a straight brass spring, with which contact is made by pulling out the knob. This rings a bell at the fire-station, and the alarm is acknowledged by ringing a small gong in the post which is attached to the back of the metal disc. The knob is automatically locked when drawn out, and can only be released by the fireman's master key. By the aid of this key

a private code of signals can be transmitted between a fireman at the post and those at the fire-station. The posts are at present worked on the open-circuit system. Every post is tested by the firemen once a week. The whole system of alarms in connexion with each station is worked by a battery of four cells.

The batteries used are somewhat similar to the Leclanché battery, but larger, and the carbon mixture is placed on the outside of the porous pot with the zinc cylinder inside. The liquid used is a solution of sal-ammoniac. Four cells are generally used throughout the system for ringing the bells and working the telephone instruments. This number of cells is also sufficient to work the fire alarm switch-boards as before described. For these batteries Messrs. Blenheim & Co., the manufacturers, claim that they have a less internal resistance and continue in action for a greater length of time, also that they recover in shorter time than the Leclanché battery.

#### QUESTIONS OF BUILDING LEGISLATION.

SIR.—In the course of the Metropolitan Board of Works Inquiry, Lord Herschell being 1. Given his opinion of the meaning of the judgment of the House of Lords (in which he himself took part) in the important *De Vere Gardens* line of frontage case.

2. Has explained that until the superintending architect has defined a general line of frontage in each particular case, the offence of projecting beyond the general line of frontage cannot be committed, because there is nothing to project beyond.

3. Has given his opinion that the words "used wholly or in part for the purposes of trade or manufacture" apply to shops used for retail trade.

As these opinions and explanations touch very important matters, and Lord Herschell being an Ex-Lord Chancellor (and, as a judicial member of the House of Lords, a present Judge), I should be glad to hear from some of your lawyer readers whether these utterances could be quoted in a court of law as any other opinion of a judge could be quoted when given *ex cathedra*, and in the course of judicial proceedings. More especially is it interesting to know this, as No. 2 is somewhat startling, and No. 3 quite contrary to the practice of the past thirty-two years.

A. H.

#### SCHOOL BOARD TENDERS.

SIR.—The School Board for London have been inviting tenders for heating the Amiens-street school, Battersea, and I am perfectly amazed to find the highest tender 1,740l. and the lowest 440l.—only a difference of 1,300l. I ask, how can this be? Can the same specification and plan have been given to each of the eleven firms who tendered? and further, will the School Board Inspector of Works see that the work is carried out (for the 440l.) in the very best possible manner, both as to quantity and quality of materials, also workmanship, before the account is certified? I am quite in favour of honourable competition, but this instance is beyond a joke. Several other well-known names appear in this competition, whose amounts vary from 850l. to 1,000l., showing the absurdity of the lowest.

I shall be glad if any of your readers can throw any light upon this mystery.

HEATING ENGINEER.

\* \* We called attention to the extraordinary difference of the highest and lowest tender, as we sometimes do in such cases, by a (!); but we hardly suppose the prices can be for the same system of heating or the same specification. We take it that each firm must have been invited to say for what sum they would efficiently heat the schools. If that is so, however, it cannot be regarded as a satisfactory position, as the Architect to the Board certainly ought to have a definite opinion as to the best system of heating. The matter certainly needs explanation. It looks as if the Board had been trying an experiment to obtain economical heating.

**Proposed New Municipal Buildings at Richmond.**—It will be remembered that a few weeks since Sir J. W. Ellis presented to the town of Richmond the Castle Hotel, which had for some time been in the market. The presentation was made to the inhabitants with the view of the building being converted into municipal offices, and this is about to be carried out. The Works Committee of the Vestry have had under their consideration plans for the laying out of the site, which, in addition to the hotel itself, includes a considerable area of ground. The plans have now been agreed upon. The building will, to a considerable extent, be reconstructed.

#### The Student's Column.

##### ARTIFICIAL STONES.—IV.

*Semi-Vitrified Stones (continued).*

**W**HAT were termed "Improvements in Artificial and Malleable Stones" were patented by Giret in 1853. The employment of the term "malleable" in this connexion is an illustration of the loose and inaccurate phraseology which disguises so many specifications, for the power of being beaten out or rolled into sheets, which is understood by the term "malleability," is most certainly not a property that Giret's stone can lay claim to. The patentee directs that any kind of sand, earth, stone, or metallic ore may be used indifferently after being strongly heated and powdered. This powder is next mixed with fluxes, such as boracic acid, oxide of lead, caustic potash, or soda placed in a furnace and fused, and suddenly, while still hot, precipitated into water. The sand so obtained may be of various colours, if suitable oxides are added previously to fusion. The sandy product, reduced to impalpable powder, is placed in fireclay moulds of necessary shape, and submitted to the action of the oven, until the particles cohere. After cooling slowly, the stone may be polished.

Bellford's patent, which received provisional protection only, varies the above procedure somewhat. The sandy and earthy substances are fused, chilled, and pulverised, and then mixed with unbleached wax to give cohesion to the mass, and to enable it to be carved or moulded into the necessary shape; the articles so formed are heated strongly to get rid of the wax, and then burnt in the usual way. It was also proposed to copy statues or other works of art by taking impressions of them in wax, and from these to make moulds of fireclay, which were then to be filled with the above sandy mixture, and submitted to a melting temperature.

In 1856 an artificial stone was made from iron ore (preferably red ochre or hematite, mixed with clay), pulverised, sifted, and incorporated with acidulated water (sulphuric acid is recommended). The plastic material so obtained was pressed into suitable moulds, baked up to the temperature necessary for fireclay, when a product having a bluish colour and glassy surface was obtained.

An ivory-like stone, suitable for small articles and ornamental stonework, was invented by R. H. Hess in 1850. Certain silicates of magnesium, such as talc and steatite, were employed, being powdered and pressed into moulds of any desired form, and then baked. In some cases, alumina, kaolin, lime, carbonate of barium, and colouring matters might be added.

Lefarge's "Artificial Sandstone" (1859, pat. 1,511) is made from a mixture of fine sand and clay, moulded with water, pressed, dried, and burnt in kilns.

B. Barrett's stone, patented in 1860, was a mixture of pulverised stone, pearlash, salpêtre, borax, lime, oxide of lead, clay, and calcined flint, pressed into moulds, dried, and baked.

Pozzi's "Artificial Granite" was made by combining glasses in suitable proportions with one or other or any of the following ingredients, viz.:—"Granitic" sand obtained by reducing refuse broken granite by heat, pounded glass, iron slag, lava, and potash. The mixture is moulded and baked at a high temperature.

Some Viennese inventors brought out in 1873 a stone which was obtained by using special cements made from dolomites containing at least twenty-five per cent. of carbonate of magnesium. The material, called "cement of magnesite," was stated to be hydraulic and permanent if it does not for the first two or three days come in continual contact with water.\* This cement, it is alleged, will bind satisfactorily twice as much sand as ordinary cement. Artificial stone is formed from a mixture of the cement with sand made into a stiff paste with water, moulded, burnt in kilns, and finally immersed in water for several weeks.

In 1883 a patent "stone," said to be hard and refractory, was made by combining, moistening with water, pressing, and baking at a white heat, mixtures of such minerals as serpentine, soap-stone, felspar, mica, quartz, and fireclay, or some of these variously combined.

\* In a future article the liability to ultimate disintegration of cements containing magnesia calcined at a high temperature will be referred to and explained.



A material termed in America "terra-cotta lumber" is obtained by mixing, according to the degree of porosity desired, 1 to 3 parts of resinous wood with 1 part of kaolin and sufficient water to form a spongy mass, which is exposed in metal cylinders to strong compression with steel stamps, the result of this operation being to form cylindrical blocks of from 8 in. to 12 in. diameter, and from 4 ft. to 6 ft. long. The blocks are dried in the air, then in an oven, and finally heated in furnace to a white heat. The blocks when finished are said to be very strong, and can be cut, sawn, and planed, and, moreover, their weight is only about half that of ordinary brick.

## Books.

*Triangulation and Measurements at the Forth Bridge.* By REGINALD E. MIDDLETON, M.Inst. C.E., M.Inst. M.E. London: E. F. & N. Spon. 1887.

THIS is a small book, the substance of which appeared in the pages of our contemporary the *Engineer*, here reprinted with additions, and which sets forth in a brief and business-like manner, and without a single superfluous word, the history of the survey for the Forth Bridge, which was mainly carried on under the immediate direction of the author. The large scale of the work, and at the same time the extreme accuracy required and aimed at in this survey, upon the correctness of which depended the setting-out of steel work to extend over a distance of a third of a mile between points separated by water, renders the record of it of no little value and interest.

The first thing Mr. Middleton had to look to in commencing operations in January, 1883, was the securing of a base line on the Queensferry shore, for which three standard rods 12 ft. long were ordered, and the base line set out with these, on a gradient, however, which necessitated a drop at every three or four rods' length. The author records that the tendency in all cases was for the direct measurements made to be "too long," and he goes on to say that "the tendency may be easily accounted for by the fact that where three rods are placed, any shake must cause them to spread from the centre." This tendency of the rods to settle away from each other would, of course, cause the registered measurement to be short between any two fixed points, but long as determining any two points: the distinction is rather lost sight of in the wording of the sentence.

For the history of the setting-out of the work, and the triangulation adopted, we must refer the reader to the book. We may mention here some experiences, in regard to the behaviour of the various materials, which are of interest. The difficulties with the measuring rods and standards were considerable. "A stone bed was laid down in the cellar of the offices, carefully dressed level, and with brass ends leaded into the stone, the whole being made to fit the 12 ft. rods when at their standard length. This was, however, found to be quite useless, owing, probably, to the stone being in two pieces, and laid on a bed of concrete; the concrete expanded, and the stone settled towards the ends. At any rate, whatever the cause, this gauge in a comparatively short space of time was found to be  $\frac{1}{4}$ th of an inch too long. A more reliable standard was obtained by measuring a length of 540 ft. along a straight rail on the railway, with three standard rods, and cutting marks in the rock at both sides; then by a string or wire stretched from mark to mark the termini of the standards could always be marked on the rail when wanted, without reference to any movement of the rail itself. In sounding for contours of the rock for the Inchgarvie piers, copper wire was a failure, as it stretched and broke, and eventually the sinker used for these soundings was a bar of iron  $\frac{1}{2}$  in. thick and 10 ft. long, with a lead weight cast on it about midway of its length, and the sounding wire was of steel  $\frac{1}{4}$  in. in diameter. The soundings were made from a raft moored and fixed in position by two theodolites bearing from different positions on the centre of the raft, which was secured by cables hauled taut when soundings were to be commenced, but which must have had some lateral movement; not such, we suppose, as would materially vitiate a series of measurements chiefly occupied with vertical distances.

The 12 ft. standard rods used in setting-out

the greater part of the foundations were of white pine, 12 ft. in length and 3 in. square, the ends of brass, with steel faces cast in. The author recommended wooden rods as not giving way to such sudden changes of length in varying temperatures as would be the case in metal ones; but the setting-out of the steel work on shore was done with steel rods, as these might be expected to follow the temperature of the manufactured steel pretty closely. To assist the attainment of accuracy in this part of the work, a steel standard, about 400 ft. long, made of bridge rails 68 lb. to the yard, riveted together at the joints, and firmly bolted to a mass of concrete at the centre of its length, was laid down in the centre of one of the roads in a wooden box with a movable cover; the 12-ft. standard rods were corrected for length to the temperature of the steel rail on a certain day, and the rail was marked at the end of each rod, and each division so marked was divided up by a pair of compasses. The fact of the work being on such a very large scale, and yet requiring minute accuracy of adjustment, brings out more remarkably than in most engineering works the mobility of all the substances with which we have to deal in construction, and the great difficulty of obtaining in practice the accuracy which seems possible in theory.

Steel bands were used occasionally for checking purposes, but, though useful for this, could not be relied on for primary measurements without great caution, as it was found their changes of length were sudden and great. The same remark applies to steel tapes, and Mr. Middleton remarks on the great inaccuracy of their ends. He suggests that, instead of the ordinary ring or handle, a brass end with a square face accurately cut to length and riveted to the tape or band should be used. In all cases where accuracy was required it was found necessary to hold the tape or band at the one-foot mark, which, of course, gives a large opening for errors, through forgetting to allow for the foot thus lost.

It will be seen that there are some useful practical experiences to be gathered from this account, very interesting in other ways, of the preliminary survey for the greatest engineering work of modern times.

*Practical Hints for Draughtsmen.* By CHARLES WILLIAM MACCORD, A.M., Sc.D. New York: John Wiley & Sons.

THIS is a book which is well worth perusal. The author certainly advocates many departures from our usual English drawing-office practice, and although there is a great deal to be said for the methods he advises, we cannot bear him out unreservedly. His object in writing this treatise is, however, a good one, and anything which can be done to make drawings clearer in the workshop and to minimise the work in the drawing-office will commend itself to the practical mind. The author's remarks on free-hand sketching are very practical, and will prove very useful to the student. He devotes a small space to "Sketching from Measurement," "Making Freehand Copies from Working Drawings," and "Making Sketches from Memory," and "Sketching from the Object without Measuring," concluding with several pages of "Practical Suggestions," containing some very useful examples. The last chapter treats of drawing instruments and materials, giving hints on the selection of both, and a few remarks on their use and care. The first chapters in this book are certainly steps in the right direction, but would be of little use to the architect, as they deal principally with machine and engineering drawings.

*The Design and Construction of Masonry Dams.* By EDWARD H. WEGMANN, JUN., C.E., M.A. M.C.E. New York: John Wiley & Sons. 1888.

ONE has only to glance at the frontispiece of this important work to realise the state of uncertainty which exists as to the theory of the design of masonry dams. We there see the comparison of six profile types, all proposed by eminent men, yet each differing from the others.

The principles of stability of dams are simple enough in themselves, but to find formulae which exactly satisfy the conditions of stability at every point of the dam, and thus give us the most economical profile, is, with our present knowledge, beyond our power.

The ordinary method of designing a dam is purely a tentative process, which is usually preferred to solving long equations or to making

trials with the subtangent of a logarithmic curve, as proposed by the late Professor Rankine.

The equations given by Mr. Wegmann for designing the profile of a dam are certainly much simpler than any we have yet seen, and much time will no doubt be saved by their use.

Before entering upon the details from which his formulae are derived, the author shows briefly the different steps taken by De Saizily, Delocre, and Rankine, and mentions several other engineers by whom the theory of dams has been developed.

The first half of this book is devoted to the theory of design, and the second half to the description and construction of several of the most important masonry dams which have been constructed.

The book is replete with useful information, not only giving us an account of the construction of dams in Spain, France, Algeria, England, and America, but containing excellent diagrams of profile types, and of the various works described.

The scientific design of masonry dams was little thought of until within recent years, but the necessity for high dams has, within the last twenty years, called for a more precise knowledge upon which to rely. We are told by the author that the French were the first to consider the theoretical question, and that the Furens dam, 164 ft. high, based upon a type proposed by M. Delocre, was the first masonry dam scientifically designed.

We can highly recommend Mr. Wegmann's book as a work which will further elucidate a troublesome subject, and give some valuable practical information useful to those engaged in designing dams.

*Notes Embodying recent Practice in the Sanitary Drainage of Buildings, with Memoranda on the Cost of Plumbing Work.* By W. PAUL GERHARD, consulting engineer for Sanitary Works. New York: D. Van Nostrand, 1887.

THIS is a small book, almost a pocket-book, containing a great deal of practical advice, mostly very good, in a small compass. The recommendations are generally such as are now usually concurred in as sound, both in England and the United States, the two countries in which in recent times the most careful and enlightened attention has been given to sanitary improvements. Occasionally the writer falls below the standard we should set up; for instance, under "Rules regarding the planning and location of plumbing work in dwellings," to say that "in small houses it is preferable to separate the water-closet from the bath-room," is much too moderate a way of putting it; it should rather be said, "No consideration of economy can justify the combination of bath-room and water-closet in one apartment; it is a barbarous, disgusting, and insanitary arrangement, which should in no case be allowed." That would be our way of putting it. At the same time, the special consideration of the planning and placing of plumbers' work is a very good point in the little treatise, and one often overlooked. We do not quite comprehend the remark "overflow-pipes and waste-pipes not in daily use are objectionable." As to waste-pipes this is perfectly true and reasonable, but how can an overflow-pipe to a bath, for instance, be in "daily use," unless it is placed so low as to practically prevent the bath being ever filled? It is very desirable to flush such an overflow from time to time, no doubt, but it is impossible, in the nature of things, that it can be "in daily use" unless it is a custom to fill a bath to overflowing every day.

A special point in the book is the attention drawn to the importance of leaving drains and traps in such a condition that they may, as far as possible, be found efficient on return, in cases where the house has been left empty for some time during a migration to winter or summer quarters. This is a matter generally quite overlooked. Water evaporates out of traps, and the inhabitants return to a house permeated by sewer air. The author's suggestions on this head (pages 106-8) are worth attention.

## Church Clock, Hindley, near Wigan.

On Sunday morning, July 22nd, a large chiming clock was started in St. Peter's Church, Hindley, by the Rev. Peter Jones, the vicar. The clock has four dials, each 6 ft. across. The quarters are chimed upon four bells, and the hours are struck upon the largest bell in the tower. The clock is by Messrs. John Smith & Sons, Derby.







## MEETINGS.

SATURDAY, JULY 28.

*Architectural Association.*—Visit to Professor Herkomer's House and Schools at Bushey. Members to meet in Hall of Euston Station at 2.30 p.m.

TUESDAY, JULY 31.

*Institution of Mechanical Engineers.*—Summer Meeting, to be held in Dublin, under the presidency of Mr. E. H. Carbutt.

WEDNESDAY, AUGUST 1.

*Institution of Mechanical Engineers.*—Meeting in Dublin continued.  
*Builders' Foremen and Clerks of Works' Institution.*—8.30 p.m.

THURSDAY, AUGUST 2.

*Institution of Mechanical Engineers.*—Dublin Meeting continued.

FRIDAY, AUGUST 3.

*Institution of Mechanical Engineers.*—Visit to Belfast.

## Miscellaneous.

**Mixing Sugar with Cement Mortar.**—Experiments on the reported increase in the binding effect of cement mortar by the addition of sugar have been made by Captain A. v. Grünzweig, of Vienna, which have just been published. Mixtures of cement and sand, consisting of one part cement and three parts sand, to which 10 per cent. of water was added, and of pure cement with as much water as was necessary to give the mass the required plasticity, were prepared. From 1 to 5 per cent. of powdered sugar was well mixed with the dry cement. The cement used was of inferior quality, the sand being ordinary building sand, and not the so-called "normal" sand, which is of a superior quality. For this reason, and also because the samples, prepared in accordance with the rules for testing Portland cement laid down by the Austrian Society of Engineers and Architects, were left to harden in a dry place, and not under water, the strength obtained was far below that prescribed and generally obtained. All the samples were prepared by the same person, under the same conditions, and with the same care. For each series of samples of mortar to which sugar was added, a comparative series without sugar was made. The tenacity was ascertained by Kraft's cement-testing machine. It deserves mention that the samples with sugar, especially those of pure cement, showed a strong tendency during the first twenty-four hours to combine intimately with the smooth china plate on which they were placed, and to swell. The experimenter gives full particulars of the trials. As the result of his trials, it may be briefly stated that with mixtures of cement and sand, by hardening in a dry place, the binding effect may be raised by the addition of sugar, which reached its maximum with from 3 to 4 per cent. of sugar added. With pure cement, the binding effect was not increased.

**Railway Construction in the United States.**—From a return just to hand, it appears that the year 1888 will not be far behind 1887 with regard to the construction of new railways in the United States. Up to the end of June, 3,320 miles of new track had been laid down, against 3,754 miles built in the first six months of 1887. The total last year reached nearly 13,000 miles, and as in the United States the greatest activity prevails in the latter half of each year, we may perhaps take it for granted that the present year will exceed any previous year, excepting, of course, 1887. The figures given so far bring out a remarkable fact, namely, that, while the 3,754 miles reported for the first six months of 1887 were laid down by 136 companies, the 3,320 miles built thus far this year represent 168 lines. That is to say, the mileage built in the first six months of 1888 averages less than 20 miles to each line. This seems to indicate that the new mileage will be made up by the construction of a large number of comparatively short roads, instead of comprising, to a great extent, long lines built by a few companies.

**Building at Tangier.**—There has been an increased trade in building materials generally, especially in cement, deals, and iron rafters, owing to the large number of houses being built at Tangier. The cement is chiefly English, whilst the deals and iron rafters, though shipped in England, are respectively of Belgian and Swedish origin.

**New Town Hall in Copenhagen.**—The Corporation of Copenhagen has decided upon erecting a new town hall in that city, the cost of which is estimated at 25,000*l*.

**The Engineering Trades and Bridge Building.**—Mechanical engineers are, as a rule, busier than last year, and, judging by the proportion of inquiries that result in actual business, the prospects for the autumn are good. The increase in the general exports of the country is favourable to engineers, as activity in the textile as well as in the iron and other trades tells speedily on all who provide the machinery of manufacture. Plant and tools for iron and steel works, mining and pumping engines, areal plant, railway appliances, and workshop equipment for home and Indian lines, are what at present afford most employment. Petroleum engines, in which vaporized oil serves the same purpose as gas in a gas engine, are apparently a success. There is the same cycle of explosions, and the advantage is only where cheap gas is unobtainable. Bridges and structural steel-work are now purchasable at prices unprecedentedly low, and it can only be hoped that the encouragement thus afforded to public works by the cheap construction of railway bridges and large roofs may compensate makers by an increased demand for the low prices they have been obliged to accept. The solidity and permanent durability of riveted work which the modern system of hydraulic machinery allows is encouraging the choice of such connexions in preference to pin joints; and even in the United States, where the latter method has prevailed, it is becoming recognised that the cheapness and expedition in erection which pin joints allow are not the determining feature in bridges for heavy railway traffic. In America, pneumatic riveting machines in which a low air-pressure is concentrated by larger cylinders and longer levers than in English hydraulic machines are almost universal for portable machines. Hydraulic pressing and forging machines are common to both countries, but except in steel works the accumulator system is not so widely applied in America as in England. Bridges have been in considerable demand for India, South America, and the Colonies, but there are no new structures of importance ordered so far this year. The railway companies in England are steadily strengthening and renewing their older bridges to meet the exigencies of modern traffic; while in Canada and the United States the replacement of old wooden structures by steel or iron will give employment to bridge builders in these countries, even though the demand for new lines should not meet present expectations. (—From Matheson and Grant's "Engineering Trades' Report," July 15.)

**The Water Supply of Hamburg.**—The Corporation of Hamburg has voted a sum of 337,000*l*. for the filtration of the water supplied by the Hamburg Stadtwasserkunst. The water is taken directly from the Elbe, and is reported by Hamburg journals to be very bad. Since their establishment the Hamburg Waterworks have cost 650,000*l*., exclusive of the above sum. It would seem that the water supply at present is very dear, the cost being 4 sh. per individual head of the population. The *Börsenhalle* says that great satisfaction must be expressed at the step taken, as some physicians are of opinion that the bad drinking-water was the cause of cases of typhus last winter.

**New Official Buildings in Stockholm.**—It is proposed by the architect of the Swedish Government, Herr Zetterwall, to erect the new Houses of Parliament, for which money was recently granted, on the so-called Helgelandsholme, an island in the Stockholm river, facing the Royal Palace. Here the new Treasury buildings are also to be built, the cost of the whole being estimated at about 600,000*l*. This would effect a great improvement in the Swedish capital, the island in question, now occupied by the Royal stables and stables, being an eyesore. A new theatre is also to be built in Stockholm, at a cost of 45,000*l*.

**Exhibition in Helsingfors.**—During the present summer an exhibition of forestry, manufactured wood goods, and metallurgy will be held in Helsingfors, in Finland.

**Wesleyan Chapel, Penryn.**—The design prepared by Mr. J. Wm. Tronson, architect, Penzance, for the new Wesleyan chapel at Penryn, Cornwall, has been selected.

**Festive.**—The employees of Messrs. Dent & Hellyer held their twenty-seventh annual dinner at Broxbourne, on the 21st inst., Mr. S. Stevens Hellyer in the chair.

**Preparing and Cleavage of Slate.**—The managers of the Tiberthwaite Green Slate Co. have issued a rather pretty little pamphlet on their industry (which has been carried on in the same quarries for about two centuries), with photographic illustrations showing portions of the quarries and different departments of the yard works. We extract the following note on the preparing of slate:—"The blocks of slate rock have to be detached from the sides and floor of the quarry in the first place by blasting with gunpowder; men being let down the face of the cliff-like sides by ropes, to bore the necessary holes for the insertion of the charge. After the rock is detached, it passes to the hands of men called 'dockers up,' who reduce it to suitable sizes, by aid of heavy hammers and chisels, for hoisting to the surface, where it goes to the splitting or 'riving' sheds, to be split up into 'flakes' or 'layers,' so to speak; after which it passes to the 'dressers,' who cut it to the necessary shapes and sizes. The question of the splitting of slates or 'cleavage,' as it is properly called, is a very interesting one; and such eminent authorities as Professor Sedgwick, Professor Tyndall, Professor Phillips, Professor Ramsay, Sir H. De la Beche, and Mr. Sorby differ as to the probable agency to which this result is due, some advocating magnetic current and others mechanical and chemical action. There are two modes of 'splitting' in common use amongst the quarrymen: one (the Welsh) carried out by hammer and chisel, the other (the Westmoreland) being brought about by the use of a light thin edged hammer alone, by which the splitter divides the slate by very skilfully applied blows at the side of the slate along the line of cleavage."

**New Foot-bridge over the Ouse at Bedford.**—A new foot-bridge, erected for convenient access to the new public recreation grounds acquired by the Bedford Corporation on the south side of the River Ouse, was opened on the 11th inst. by the Marquis of Tavistock. The bridge consists of two light-braced segmental ribs, 100 ft. clear span, and 7 ft. apart, from which is suspended the footway, by rods  $\frac{1}{2}$  in. in diameter. The footway is of cement concrete, laid on corrugated flooring plates, 3 in. deep, 12 in. pitch, and  $\frac{1}{4}$  in. thick. The soffit of the main ribs is 25 ft. above the water-line at the centre of the river, and that of the curved footway 15 ft., both springing from the river bank, so as not to impede the view along the ornamental gardens on the river side. The main ribs each consist of four angle irons 4 in. by 3 in. by  $\frac{1}{2}$  in., braced together with angle irons and flat bars 3 in. by  $\frac{1}{2}$  in. and 2½ in. by  $\frac{1}{2}$  in. A wrought-iron handrailing is attached to the suspension-rods on each side. The total weight of ironwork, including flooring-plates, bolts, &c., was under 18½ tons. The engineer for the work is Mr. John J. Webster, M. Inst. C.E., of Liverpool, who also designed the large iron roadway bridge for the Bedford Corporation, which was opened three years ago. The contractors for the ironwork are Messrs. E. Page & Co., Bedford.

**Portsmouth Waterworks.**—Messrs. Morgan, Isled, & Morgan, of Southampton, have just commenced the erection of large engine and boiler-houses, chimney-shaft, &c., at Bedhampton, near Portsmouth, for the Borough of Portsmouth Waterworks Company, the contract for the buildings, &c., having been entrusted to them. This pumping-station is entirely a new one, to meet the demands of a rapidly-increasing population at present supplied by this Company. Messrs. Joseph Quick & Son, of Westminster, are the engineers for these works, the total cost of which is estimated at some 17,000*l*.

**Hygienic Researches in Swedish Schools.**—The Association of Teachers of Sweden is, with the assistance of medical and sanitary experts, on the point of investigating the hygienic conditions of the National and Board schools of Sweden, with a view to their improvement. To that effect some 3,000 circulars have been issued, calling upon schoolmasters to answer forty tabulated questions respecting the sanitary conditions of their schools, and the material thus collected will be submitted to the experts referred to to report thereon.

**Exhibition at Athens.**—Early in October an exhibition of Greek and foreign arts and manufactures is to be opened in Athens, lasting for six months.



**The Association of Public Sanitary Inspectors of Great Britain.**—At a special meeting of the Association of Public Sanitary Inspectors, called for the revision of rules, held at Connaught Mansions, Victoria-street, S.W., on Saturday, the 21st inst., Mr. Hugh Alexander, Chairman of Council, presiding, it was unanimously resolved to add to the title of the Association the words "of Great Britain," the enlargement of title having become necessary owing to the wide extension of the movement, inaugurated by the Association in 1883, to secure, by the union of all public sanitary inspectors, the interests of the public health. The President, Mr. Edwin Chadwick, C.B., who was unable to be present, addressed a communication to the Chairman, cordially approving the proposed enlargement of title. The full title of the Association will be in the future "The Association of Public Sanitary Inspectors of Great Britain." Fifteen members and associates were elected, and it was announced that the Association had received and accepted an invitation from the Mayor to hold a meeting at Brighton in August.

**Excavations at Bothwell Castle.** The *Glasgow Herald* says that "at the instance of the proprietor, the Earl of Home, some interesting excavations have been going on at Bothwell Castle, with the effect of laying bare the ancient foundations of the portion which for many centuries has been razed to the ground. The spot operated on is the grass-grown mound to the rear of the ruins—a wide area covered with large spreading oaks, beeches, and other trees. A wall, the continuation of the north side of the castle, has been traced, with as also another wall running transversely to a similar tower of larger size than the first one. They are the counterparts of the flanking towers overhanging the river. The operations, which are not yet completed, have been carried out under the superintendence of Mr. Archibald, head gardener. In the debris there have been found a winding horn made of clay and enamelled, and a horse-shoe. A squad of men are engaged cementing the upper portion of the ruins, and otherwise preserving them from the ravages of time."

**Birmingham Archaeologists at Knowle.**—On Saturday the Archaeological Section of the Birmingham and Midland Institute made an excursion to Knowle. On arriving at Knowle station the party drove to Knowle village and examined the church, which was built in the fifteenth century by Walker Cooke, who also founded a guild and college of priests. Mr. J. A. Cosins pointed out the successive architectural changes and enlargements made by the founder, these being clearly shown in the fabric. The church contains one of the finest carved oak roof-screens to be found in the Midland Counties. The party then walked by a very pleasant route to Temple Balsall, where the old parish church—on the site of a preceptory of the Knights Templars, and afterwards of the Knights Hospitallers—was visited. This church was restored by Scott in 1849. The almshouses founded by Lady Catherine Leveson in 1677 were afterwards visited.

**The Frederick Edwards Testimonial Fund.**—We are asked to again call attention to this fund. We referred to the proposals of the Committee in our last volume (p. 256), but may here briefly remind our readers that the fund is not only being collected in acknowledgment of Mr. Edwards's public services over a long series of years in all matters connected with the domestic use of fuel and the prevention of smoke, but in order to provide what is absolutely necessary, viz., a moderate provision for Mr. and Mrs. Edwards for the remainder of their lives. Mr. Edwards's address is Boston Cottage, Shanklin, I.W.

**Sale of Building Land at New Barnet.**—The sale of second portion of the freehold building-site, consisting of shop-plots, situate at the junction of Station and East Barnet roads, was conducted by Mr. E. Fergusson Taylor at the "Railway Hotel," New Barnet, on Monday last. There were nine lots, three of which (having areas from 120 to 157 square yards) sold for 150*l.* each. A fourth lot, having an area of 135 square yards, fetched 300*l.* Five of the lots were not sold.

**Prizes for Plumbers.**—The Plumbers' Company have made a grant of five guineas to be awarded as prizes to the students attending the plumbing classes at the Polytechnic Y.M.C.I., London, for the session 1888-9.

**Value of Property in Cheapside and Baywater.**—In a compensation case heard at Guildhall on Saturday last, the freeholders of a corner site, 115 and 116, Cheapside, were the claimants against the Commissioners of Sewers, who required the property for the widening of Milk-street. For the claimants, Mr. G. P. Bidder, Q.C., and Mr. H. A. De Colyar appeared, instructed by Mr. C. G. Woodroffe. For the Commissioners, Sir Edward Clarke, Q.C., M.P., and Mr. Rose Innes appeared, instructed by Mr. A. E. Bayles. The surveyors retained on behalf of the claimants were Mr. E. Farmer, Mr. S. Walker, Mr. Lang, and Mr. W. H. Woodroffe. For the Commissioners, the witnesses retained were Mr. Robert Vigers, Mr. W. J. Beadell, M.P., and Mr. Legge. After some discussion between the counsel on both sides it was agreed that the sum of 22,500*l.* and taxed costs should be awarded to the claimants. The area of the site is 1,300 ft., and the premises were subject to a lease at 800*l.* per annum for an unexpired term of 16½ years. The claim was based on an estimated ground rental value of 20*s.* per foot, super-deferred for 16½ years, on which basis the verdict was practically given. The *Times* reports that at the Auction Mart on Wednesday, Messrs. Edwin Fox & Bousfield sold the whole of Orme-square, facing Hyde-park, for 38,000*l.* It comprises 12 houses let on leases, the longest of which expires in 1899, at rents amounting to 1,240*l.* per annum.

**Awards at the Bolton Sanitary Exhibition.**—In the list of awards at the Bolton Exhibition, published in the *Builder* of last week [p. 48], Mr. W. Fox's corrugated rolled steel tyre for vehicles for common roads was not mentioned as having received a medal after deferred practical trial. We omitted to mention it as it seemed to be a little wide of the exhibits in which our readers are specially interested, but, from particulars which have since been brought to our notice concerning it, it seems to be well worth mentioning as affording a greatly-increased degree of safety when driving over town roads along which tramways are laid. The corrugations, it should be explained, are not on the surface of the tyre, but on the edges, so that the bounding or side lines of the tyre are zigzag. The tyre thus overlaps the inner and outer sides of the felloe of the wheel at short intervals, and prevents the wheel from becoming locked or jammed in a tram-rail groove. The new safety tyre is not quite so neat and slightly as the old-fashioned one, but it seems likely to conduce to the longevity of axles and springs, and to diminish the risks to life and limb hitherto incurred when driving over tramway lines.

**Society of Art-Masters.**—A meeting of Masters of Schools of Art was held on Wednesday and (by adjournment) on Thursday in the Lecture Theatre of the South Kensington Museum, to form an association representative of their interests and of the interests of art education. About sixty gentlemen attended from all parts of the kingdom, and a society was established to be called the Society of Art-Masters. Mr. Edw. E. Bayles of Birmingham was appointed chairman for the ensuing year; Mr. Alex. Fisher, of Brighton, vice-chairman; and Mr. Francis Ford, secretary. Membership is limited to holders of an Art-Master's certificate (third grade) from the Department of Science and Art.

**Sale of a Building Estate at Broadstairs.**—An extensive property at Broadstairs, known as the Stone Park Estate, is about to be laid out for building upon. The property covers an area of 123 acres, and Messrs. Moss & Jamieson, of Chancery-lane, have just disposed of it in several lots. One of the lots, containing 32 acres, was sold for 4,000*l.*; and another lot, containing 50 acres, realised 5,000*l.* The total sum realised by the sale of the estate is 12,775*l.*

**The Association of Municipal and Sanitary Engineers and Surveyors.**—Besides the report of the visit of this Association to the Barking Sewage Works, which will be found in another column, reports of several other visits to works, &c., are in type, but are crowded out this week. We print two of the papers read during the annual meeting, viz., that by Mr. McKie, City Surveyor of Carlisle, and that by Mr. De Courcy Meade, of Hornsey.

**Rebuilding of Sevastopol.**—The progress of the rebuilding of this town is rapid, and skilled workmen find a demand for their labour at Sevastopol, Sympheropol, and Yalta. At the last-named town builders, cabinet-makers, and carpenters can, in proportion to their skill, find a most remunerative market.

**The English Iron Trade.**—The improvement in the English iron market, of which we had the first indications several weeks ago, is being steadily maintained, and this week it has all the appearance of a permanency about it which has hitherto been absent. The condition of the pig-iron trade, if it is not all that can be desired on account of the lowness of prices, must certainly be pronounced healthy. There is a well-sustained demand; shipments are keeping up well, leading to a gradual diminution of stocks. Middlebrough pig has gone up another 6*d.* a ton, and is now very stiff at 32*s.* 6*d.*, makers being unwilling sellers at that price. Both Scotch warrants and Scotch makers' irons have been improving during the week. The tone of the Lancashire crude iron market is stronger than it has been for some time past. Bessemer iron keeps very steady. If the change in manufactured iron has not been very great, it is, at any rate, moving in the right direction, manufactured iron, with a fairly good demand, getting much stiffer. The best trade is being done in sheets and ship plates and angles. Steel for the same purpose is also very strong; the call for railway material is satisfactory, but for other descriptions of steel the tone is rather weaker. Tinsplate makers report a much greater eagerness of buyers, which has helped to strengthen prices. New orders for ships are not very plentiful just now, but yards will present a busy aspect for some time to come. Engineers' reports are encouraging, more remunerative prices being obtained by them.—*Iron.*

#### PRICES CURRENT OF MATERIALS.

|                                            |           | £. | s. | d. | £. | s. | d. |
|--------------------------------------------|-----------|----|----|----|----|----|----|
| <b>TIMBER.</b>                             |           |    |    |    |    |    |    |
| Greenheart, B.G.                           | ton       | 8  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                 | load      | 8  | 0  | 0  | 12 | 10 | 0  |
| Sesquiu, U.S.                              | foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Birch, Canada                              | load      | 2  | 10 | 0  | 4  | 15 | 0  |
| Fir, Dantisc.                              | load      | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                        | load      | 2  | 0  | 0  | 4  | 10 | 0  |
| Canada                                     | load      | 4  | 0  | 0  | 8  | 10 | 0  |
| Pine, Canada red                           | load      | 2  | 10 | 0  | 3  | 10 | 0  |
| Lath, Dantisc.                             | fathom    | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                             | load      | 6  | 0  | 0  | 7  | 10 | 0  |
| Wainscot, Odessa, crown                    | load      | 2  | 10 | 0  | 3  | 0  | 0  |
| Deals, Finland, 2nd and 1st.               | std. 100  | 8  | 0  | 0  | 8  | 10 | 0  |
| " 4th and 3rd                              | std. 100  | 6  | 10 | 0  | 7  | 10 | 0  |
| Riga                                       | load      | 9  | 10 | 0  | 14 | 10 | 0  |
| St. Petersburg, 1st yellow                 | load      | 8  | 0  | 0  | 9  | 0  | 0  |
| " 2nd                                      | load      | 7  | 0  | 0  | 8  | 0  | 0  |
| " white                                    | load      | 7  | 0  | 0  | 10 | 0  | 0  |
| Swedish                                    | load      | 7  | 0  | 0  | 15 | 0  | 0  |
| White Sea                                  | load      | 8  | 0  | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                          | load      | 14 | 0  | 0  | 23 | 0  | 0  |
| " 2nd                                      | load      | 9  | 0  | 0  | 15 | 0  | 0  |
| " 3rd, &c.                                 | load      | 7  | 0  | 0  | 9  | 10 | 0  |
| " Spruce, 1st                              | load      | 8  | 0  | 0  | 9  | 10 | 0  |
| " 2nd and 3rd                              | load      | 8  | 0  | 0  | 7  | 10 | 0  |
| New Brunswick, &c.                         | load      | 6  | 10 | 0  | 11 | 0  | 0  |
| Better, all kinds                          | load      | 4  | 10 | 0  | 11 | 0  | 0  |
| <b>IRON.</b>                               |           |    |    |    |    |    |    |
| Flooring Bars, sq., 1 in., prepared, First | load      | 0  | 10 | 0  | 0  | 13 | 0  |
| Second                                     | load      | 0  | 7  | 6  | 0  | 9  | 0  |
| Other qualities                            | load      | 0  | 4  | 6  | 0  | 6  | 0  |
| Cedar, Cuba                                | foot      | 0  | 0  | 32 | 0  | 0  | 4  |
| Honduras, &c.                              | foot      | 0  | 0  | 32 | 0  | 0  | 8  |
| Australian                                 | foot      | 0  | 0  | 32 | 0  | 0  | 8  |
| Mahogany, Cuba                             | foot      | 0  | 0  | 42 | 0  | 0  | 5  |
| St. Domingo, cargo average                 | foot      | 0  | 0  | 42 | 0  | 0  | 5  |
| Mexican                                    | foot      | 0  | 0  | 42 | 0  | 0  | 5  |
| Poland                                     | foot      | 0  | 0  | 42 | 0  | 0  | 5  |
| Honduras                                   | foot      | 0  | 0  | 42 | 0  | 0  | 5  |
| Rose, Rio                                  | foot      | 8  | 0  | 0  | 11 | 0  | 0  |
| Box, Turkey                                | foot      | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian                            | foot      | 0  | 0  | 42 | 0  | 0  | 6  |
| <b>STEEL.</b>                              |           |    |    |    |    |    |    |
| Iron—Bar, Welsh, in London                 | ton       | 4  | 17 | 8  | 5  | 0  | 0  |
| " at works in Wales                        | ton       | 5  | 7  | 6  | 4  | 10 | 0  |
| " Staffordshire, in London                 | ton       | 5  | 5  | 0  | 7  | 0  | 0  |
| <b>COPPER.</b>                             |           |    |    |    |    |    |    |
| British, cake and ingot                    | ton       | 74 | 0  | 0  | 75 | 0  | 0  |
| Best selected                              | ton       | 75 | 0  | 0  | 76 | 0  | 0  |
| Sheet, strong                              | ton       | 80 | 0  | 0  | 81 | 0  | 0  |
| Chili, bars                                | ton       | 79 | 10 | 0  | 0  | 0  | 0  |
| YELLOW METAL                               | lb.       | 0  | 0  | 74 | 0  | 0  | 7  |
| <b>LEAD.</b>                               |           |    |    |    |    |    |    |
| Pig, Spanish                               | ton       | 12 | 15 | 0  | 13 | 0  | 0  |
| English, common brands                     | ton       | 24 | 10 | 0  | 25 | 0  | 0  |
| Sheet, English                             | ton       | 13 | 10 | 0  | 13 | 5  | 0  |
| <b>SPRINGS.</b>                            |           |    |    |    |    |    |    |
| Silesian, special                          | ton       | 18 | 7  | 6  | 18 | 15 | 0  |
| Ordinary brands                            | ton       | 16 | 0  | 0  | 16 | 2  | 5  |
| <b>TIN.</b>                                |           |    |    |    |    |    |    |
| Straits                                    | ton       | 89 | 0  | 0  | 0  | 0  | 0  |
| Australian                                 | ton       | 89 | 0  | 0  | 0  | 0  | 0  |
| English Ingots                             | ton       | 94 | 10 | 0  | 0  | 0  | 0  |
| <b>ZINC.</b>                               |           |    |    |    |    |    |    |
| English sheet                              | ton       | 18 | 10 | 0  | 19 | 0  | 0  |
| <b>OILS.</b>                               |           |    |    |    |    |    |    |
| Linsed                                     | ton       | 18 | 0  | 0  | 0  | 0  | 0  |
| Cocunut, Ceylon                            | ton       | 24 | 10 | 0  | 27 | 0  | 0  |
| Ceylon                                     | ton       | 22 | 0  | 0  | 0  | 0  | 0  |
| Palm, Lagos                                | ton       | 20 | 0  | 0  | 20 | 10 | 0  |
| Rapeseed, English pale                     | ton       | 24 | 5  | 0  | 0  | 0  | 0  |
| " brown                                    | ton       | 22 | 15 | 0  | 23 | 0  | 0  |
| Cottonseed, refined                        | ton       | 20 | 10 | 0  | 0  | 0  | 0  |
| Tallow and Oleine                          | ton       | 25 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, E.S.                          | ton       | 5  | 15 | 0  | 8  | 0  | 0  |
| Lubricating, refined                       | ton       | 7  | 0  | 0  | 12 | 0  | 0  |
| <b>TRUNKS.</b>                             |           |    |    |    |    |    |    |
| American, in casks                         | cwt.      | 1  | 6  | 9  | 1  | 7  | 0  |
| <b>BARREL.</b>                             |           |    |    |    |    |    |    |
| Stockholm                                  | barrel    | 0  | 15 | 9  | 0  | 0  | 0  |
| Archangel                                  | barrel    | 0  | 9  | 8  | 0  | 0  | 0  |



## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                 | By whom required.      | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------------|------------------------|-----------------------------------|--------------------------|-------|
| New Sheds, Stores, &c.                        | Wandsworth Bd. of Wks  | Official                          | July 31st                | xiii. |
| Building Brick Wall, Fulham                   | Met. Board of Works    | do.                               | do.                      | xiii. |
| Kentish Plains and Hoggins                    | Mile End Vestry        | J. M. Knight                      | August 1st               | xii.  |
| Painting and other Works, Fulham              | Met. Asylums Board     | A. & C. Harston                   | do.                      | xiii. |
| Painting and Repairs                          | Stepney Union          | do.                               | August 2nd               | xiii. |
| Greenhouses & Pits, Offices, &c., Victoria Pk | Met. Board of Works    | Official                          | do.                      | xiii. |
| Cast-Iron Water Main, Hammermith              | do.                    | do.                               | do.                      | xiii. |
| Granite Carriageways & York Stone Footways    | do.                    | do.                               | August 3rd               | ii.   |
| Slop Vans                                     | Paddington Vestry      | do.                               | do.                      | ii.   |
| Wood Blocks for Paving                        | do.                    | do.                               | do.                      | xiii. |
| Thames Ballast, Sand, and Cement              | do.                    | do.                               | do.                      | xiii. |
| Impounding Water Reservoir, &c.               | Chelmsford Local Board | C. Perceval                       | August 4th               | xiii. |
| Painting Railings and Repairing Brick-Wall    | Lambeth Burial Board   | Official                          | August 7th               | xiii. |
| Supply of Water-Mains, and Laying same        | Ely Local Board        | do.                               | do.                      | xiii. |
| Road Making and Paving Works                  | Reigate Cor.           | R. Austin                         | do.                      | xiii. |
| New Flood Gates, &c.                          | Lewisham Board of Wks  | Official                          | do.                      | xiii. |
| Kerbing, Tarpaving, Metalling, &c., Works     | Bournemouth Com.       | G. R. Andrews                     | August 8th               | xiii. |
| Asphalted Pavement and Wood-Block Crossings   | Malvern Local Board    | J. G. Clark                       | do.                      | xiv.  |
| Well-Sinking and Artesian Boring              | Trinity House Cor.     | J. Gordon                         | August 9th               | xii.  |
| New Lighthouse at Southwold                   | Leicester Corporation  | J. S. Saviour's Union             | do.                      | xiii. |
| Main Sewers                                   | St. Saviour's Union    | Derby U.S.A.                      | do.                      | xiii. |
| Alterations to Workhouses                     | Folkestone Pleasure    | J. R. Harrison                    | August 11th              | ii.   |
| Infectious Diseases Hospital                  | Gardens Co., Lim.      | Official                          | August 17th              | xiv.  |
| Heating Apparatus                             | Met. Asylums Board     | A. & C. Harston                   | August 18th              | xiv.  |
| Repairs to Roads, Dartford                    | do.                    | do.                               | do.                      | xiv.  |
| Painting and other Work, Dartford             | Hornsey Local Board    | T. De Courcy Meade                | August 20th              | ii.   |
| Sewering and Making-good Roads                | War Department         | Official                          | Not stated               | xiv.  |
| Painting, &c., Works, Bury St. Edmunds        | W. B. Bailey           | J. G. T. West                     | do.                      | xiii. |
| Rebuilding Factory, Alington                  | War Department         | Official                          | do.                      | xiii. |
| Limewashing and Painting Works, Shrewsbury    | Barrow Chemical Wood   | Maxwell & Tuke                    | do.                      | ii.   |
| New Pulp Works                                | Pulp Co., Limited      | do.                               | do.                      | ii.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.           | By whom Advertised.    | Salary.        | Applications to be in. | Page.  |
|----------------------------------|------------------------|----------------|------------------------|--------|
| Borough Surveyor                 | Sheffield Town Council | 800 <i>l</i> . | August 9th             | xviii. |
| Junior Examiner, Office of Works | Civil Service Com.     | Not stated.    | August 22nd            | xviii. |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BANGOR** (North Wales).—For erecting a pair of semi-detached villa residences, Bangor. Mr. John H. Phillips, architect, Cardiff—

William Thomas ..... £2,450 0 0  
 W. & O. Pritchard ..... 3,225 0 0  
 Robert Williams ..... 2,187 0 0  
 R. & J. Williams ..... 2,163 0 0  
 Evan Jones ..... 2,000 0 0  
 Evan Williams ..... 1,566 0 0  
 Lewis Parry, Bodfford, Llangoed ..... 1,569 0 0  
 \* Accepted.

**BOSTON** (Lincolnshire).—For the erection of a house and shop, for Mr. R. Donison. Mr. J. Rowell, architect, Argyle-street, Boston—

W. Greenfield, Boston ..... £500 0 0  
 J. Rowell, Boston ..... 475 0 0  
 Enderby, Grimsby ..... 445 0 0  
 Johnson Taylor, Boston ..... 440 0 0  
 Billa, Grimsby ..... 438 0 0  
 W. Parry, Bickley, Kent ..... 430 0 0  
 W. H. Hinds, carpenter, } Boston. 430 0 0  
 C. Jessop, Boston (accepted) ..... 410 0 0

**BROMLEY** (Kent).—For the erection of a residence, lodge, and stabling, for Mr. A. Gurney Smith, at Bromley, Kent. Mr. H. Percy Monckton, architect, 32, Walbrook, E.C. Quantities by Messrs. Drower & Russell, 17, Southampton-street, W.C.—

Higgs & Hill ..... £3,980 0 0  
 D. Payne ..... 3,995 0 0  
 Turtle & Appleton ..... 3,800 0 0  
 Holiday & Greenwood ..... 3,777 0 0  
 T. Crossley ..... 3,761 0 0  
 Maides & Harpur ..... 3,666 0 0  
 W. J. Smith & Co. ..... 3,659 0 0  
 J. Smith & Sons ..... 3,655 0 0  
 W. Whitshire ..... 3,545 0 0  
 Taylor & Sons ..... 3,540 0 0  
 E. A. Roome, Clarence-road, Lower Clapton (accepted) ..... 3,479 0 0

**BUSKET FLETCHWOOD** (Hants).—For new conservatory, range of vinerias and plant-houses, heating apparatus, &c., for Mr. Lawson Tait. Mr. R. H. Haseman, landscape gardener.

Henry Hopo, Birmingham (accepted) ..... £1,209 4 5

**ENFIELD**.—For the erection of new schools, Clay Hill, Mr. C. Stuart Robertson, architect—

Field & Son, Farnham ..... £444 0 0  
 A. Fairhead & Son, Enfield ..... 438 0 0  
 L. & W. D. Patman, Enfield ..... 428 0 0  
 John Brooks, Enfield (accepted) ..... 425 0 0

**EPWORTH**.—For the new Wesley Memorial Chapel at Epworth. Mr. Charles Bell, architect, 3, Salter's Hall-court, Cannon-street, E.C. Quantities not supplied.

Adams, Rotherham ..... £4,370 0 0  
 Ferry, Sheffield ..... 3,438 0 0  
 Baines, Newark ..... 2,395 0 0  
 Thompson, Louth ..... 2,800 0 0  
 Wright, Lincoln ..... 2,800 0 0  
 Kelley, Epworth ..... 2,749 0 0  
 Holmes & Horton, Wainfleet ..... 2,745 0 0  
 \* Accepted. Ancaster stone dressings and pitch pine for roofs and joinery being included.

**FARNHAM**.—For alterations to closets and drainage, National School, Farnham, Surrey. Mr. Sidney Stapley, architect—

H. Patrick ..... £128 10 0  
 Tompsett & Kingham ..... 120 0 0  
 Godard & Sons ..... 113 0 0  
 T. Diamond ..... 108 0 0

**FARNHAM**.—For two houses and shops in South-street, Farnham, Surrey, for Mr. George Trimmer. Mr. Sidney Stapley, architect—

Garland, Aldershot ..... £1,395 0 0  
 Patrick, Farnham ..... 1,385 0 0  
 Tompsett & Kingham, Farnham ..... 1,370 0 0  
 Hughes, Aldershot ..... 1,248 0 0  
 Parratt, Farnham ..... 1,238 0 0  
 Diamond, Farnham (accepted) ..... 1,180 0 0

**FRIERN BARNET**.—For making-up of Friern Park-road, Finchley Park-road, Woodland-road, The Avenue, Homedale-road, Stanhope-road, and Carlisle-place, for the Friern Barnet Local Board. Mr. George Clarke, surveyor—

C. Killingback ..... £4,087 1 1  
 A. R. Ilett ..... 4,014 15 5  
 J. Bloomfield ..... 3,969 19 0  
 H. R. Trehearne ..... 3,912 0 0  
 Nowell & Robson ..... 3,872 0 0  
 Bradshaw & Co. ..... 3,811 4 7  
 J. Priday ..... 3,692 0 0  
 W. Nichols ..... 3,638 2 0  
 A. T. Caley ..... 3,624 0 0  
 Geo. Bell ..... 3,563 10 0  
 John Curnow ..... 3,560 0 0  
 Mowlem & Co. ..... 3,560 0 0  
 T. Adams ..... 3,371 19 0  
 J. Smart (Tarpaving only) ..... 541 9 2

**FULHAM**.—For works for the Fulham Vestry, Mr. J. P. Norrington, surveyor—

*Hannell-road.*

Neave & Son ..... £236 0 0  
 Nowell & Robson ..... 233 0 0  
 Adams ..... 225 0 0  
 Trehearne ..... 225 0 0  
 Tomes & Wimpey ..... 224 0 0  
 Coats ..... 217 0 0  
 Means (accepted) ..... 206 0 0

*Glendon-road (Section 2).*

Neave & Son ..... 553 0 0  
 Adams ..... 534 0 0  
 Trehearne ..... 510 0 0  
 Nowell & Robson ..... 489 0 0  
 Means ..... 489 0 0  
 Coats ..... 466 0 0  
 Tomes & Wimpey (accepted) ..... 460 0 0

*Bothwell-road.*

Neave & Son ..... 206 0 0  
 Adams ..... 195 0 0  
 Tomes & Wimpey ..... 190 0 0  
 Nowell & Robson ..... 180 0 0  
 Coats ..... 157 0 0  
 Means (accepted) ..... 177 0 0  
 Trehearne ..... 176 0 0

*Totals for the Three Roads.*

Neave & Son ..... 994 0 0  
 Adams ..... 934 0 0  
 Nowell & Robson ..... 922 0 0  
 Trehearne ..... 911 0 0  
 Tomes & Wimpey ..... 874 0 0  
 Coats ..... 872 0 0  
 Means ..... 870 0 0

**GREENWICH**.—For the enlargement of Greenwich Union Infirmary, for the Guardians. Mr. Thos. Duwiddy, architect, Greenwich. Quantities by Mr. W. T. Farthing:—

Lascelles & Co., Bunkhill-row ..... £24,687 0 0  
 Knight, Sidcup ..... 24,307 0 0  
 Wallis & Son, Maidstone ..... 24,150 0 0  
 Mowlem & Co., Westminster ..... 23,900 0 0  
 Downes, Walworth-road ..... 23,630 0 0  
 Rider & Son, Borough ..... 23,430 0 0  
 Schofield, Deptford ..... 23,283 0 0  
 T. Martin, Maidhead ..... 23,000 0 0  
 J. Morley, Stratford ..... 22,934 0 0  
 Deacon & Co., Lower Norwood ..... 22,793 0 0  
 Bunning & Son, Camberwell ..... 22,621 0 0  
 Stimpson, London ..... 22,600 0 0  
 Kilby & Gayford, Worship-street ..... 22,582 0 0  
 Parker ..... 22,479 0 0  
 Jervard, Lewisham ..... 22,467 0 0  
 Kirk & Randall, Woolwich ..... 22,230 0 0  
 Balam Bros., Old Kent-road ..... 22,222 0 0  
 Brass & Son, St. Luke's, E.C. ..... 21,783 0 0  
 Holloway, New Cross-road ..... 20,928 0 0  
 \* Proposed corrected total.

**HINCKLEY**.—For the erection of three dwelling-houses, &c., in the London-road, Hinckley. Mr. J. Wells, architect, Hinckley—

J. & W. Harrod, Hinckley ..... £1,563 0 0  
 T. Foxon, Hinckley ..... 1,343 10 0  
 Farmer & Greaves, Hinckley ..... 1,187 0 0  
 T. Shilton, Stoke Golding ..... 1,175 0 0  
 \* Accepted.

**LLANDUDNO JUNCTION** (North Wales).—For erecting six cottages on the Glynarall Estate. Mr. John H. Phillips, architect, Cardiff—

John O. Hughes ..... £1,228 9 0  
 Thomas Jones ..... 1,148 0 0  
 Henry Pritchard ..... 1,096 0 0  
 David Evans ..... 1,060 0 0  
 Berth Jones ..... 1,000 0 0  
 Robert Pritchard ..... 979 0 0  
 Edward Roberts ..... 869 0 0  
 Evan Roberts ..... 829 0 0  
 Hugh & John Jones ..... 831 12 0  
 Edward Fowkes, Colwyn Bay ..... 808 0 0  
 \* Accepted.

**LONDON**.—For rebuilding Garden House, Midway Park, for Mr. J. E. Mathieson. Mr. E. H. Hill, architect—

H. L. Holloway, Church-street, Deptford ..... £3,100 ..... £295 ..... £3,095  
 \* Reduction if yellow deal is used in lieu of pitch pine.  
 \* Accepted.

**LONDON**.—For repairs and alterations to Bethnal Green Congregational Church—

A. Taylor ..... £230 0 0  
 G. W. Beale ..... 506 0 0  
 B. Wires ..... 430 0 0  
 Jackson & Todd ..... 414 0 0  
 F. Higgs ..... 338 0 0  
 W. M. Dabbs (accepted) ..... 385 0 0

**LONDON**.—For the erection of bacon stores and warehouse, stables, &c., at Smithfield Market, for Mr. E. L. Boyd. Mr. F. Warakitt, surveyor—

Wm. Reason, 100, St. John-street, (accepted) ..... £720 0 0  
 [No competition].

**LONDON**.—For erecting offices, &c., in Tooley-street, S.E., for Mr. S. Taylor. Mr. Butterworth, architect—

Perry ..... £1,250 0 0  
 Battley ..... 947 0 0  
 H. & C. Castle ..... 894 0 0  
 W. & F. Crocker ..... 862 0 0  
 Geo. Parker, Peckham (accepted) ..... 895 0 0

**LONDON**.—For alterations and additions to St. John's Hospital for Diseases of the Skin, Leicester Square, W.C. Mr. Edward Clark, architect, 432, West Strand, W.C.—

J. Hocking ..... £275 0 0  
 T. L. Green ..... 253 0 0  
 Patman & Potheringham ..... 235 0 0  
 Jackson & Todd ..... 220 0 0  
 John Anley ..... 209 0 0

**LONDON**.—For additions to warehouses for Messrs. List & Sons, Bunkhill-row. Mr. Charles Bell, architect, 3, Salter's Hall-court, Cannon-street, E.C.—

Allen & Sons ..... £975 0 0  
 Sharp ..... 910 0 0  
 Anley ..... 890 0 0  
 Paine Bros. (accepted) ..... 870 0 0

**PADDINGTON**.—For painting and other work at the Infirmary, Harrow-road, for the Guardians of Paddington. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied:—

Dixon & Bewas ..... £510 7 8 1  
 W. H. Lesser ..... 380 0 0  
 Kirby & Chase ..... 370 0 0  
 R. G. Finn ..... 354 9 0  
 T. Maling ..... 346 10 0  
 P. H. Carder ..... 310 0 0  
 G. Foxley ..... 287 0 0  
 Stevenson & Co. ..... 269 0 0  
 W. H. Handover, 307, Harrow-road, W. (accepted) ..... 320 0 0 1

**READING**.—For works in connection with the restoration of the Church of the Holy Trinity. (First portion: reseating nave, &c.) Mr. George W. Webb, architect, Friar-street, Reading—

Wheeler Bros., Reading (accepted) ..... £1,000 0 0

**READING**.—For erecting a Temperance refreshment house, Elm Park-road, for Mr. E. J. S. Jesse. Mr. George W. Webb, architect—

Estates Workmen (accepted) ..... £860 0 0

**READING**.—For alterations to the New Inn, Oxford-road, for Mr. H. B. Blandy, J.P. Mr. Geo. W. Webb, architect—

Strong Bros., Reading ..... £431 0 0  
 Goodchild, Reading ..... 419 5 0  
 Margate, Reading ..... 396 0 0  
 Bottrill & Son, Reading ..... 377 0 0  
 Seale, Reading ..... 359 0 0  
 Winkworth, Reading ..... 357 9 6  
 Lewis & Son, Reading (accepted) ..... 363 0 0

READING.—For making a continuation of Elm Park-road, surface water and sewage drains, &c., for Mr. E. J. S. Jesse, Mr. George W. Webb, architect  
W. Reeves, Reading (accepted) ..... £160 0 0

READING.—For the building of forty-one cottages, Elm Park-road, for Messrs. E. J. S. Jesse, Mr. Geo. W. Webb, architect  
Estates Workmen (accepted) ..... £5,330 0 0

SELHURST.—For the erection of a new school and parish room in connection with the Church of the Holy Trinity, Selhurst, Messrs. Burke-Downing & Phillips, architects, 38, Craven-street, Strand, W.C. Quantities not supplied.

G. E. Bryan, High-street, South Norwood ..... £1,695 0 0 ... 660 0 0  
Smith & Bullock, Strathmore-road, Croydon ..... 1,497 0 0 ... 40 0 0  
Mades & Harper, Cherry Orchard-road, Croydon ..... 1,497 0 0  
Gould & Glasscock, Croydon ..... 1,455 0 0 ... 94 0 0  
M. Taylor, Southbridge-road, Croydon ..... 1,443 0 0 ... 77 0 0  
J. Smith & Sons, Junction Works, S. Norwood ..... 1,437 0 0 ... 70 0 0  
A. — For additional thickness in walls of parish room.

SEVENOAKS.—For the erection of St. John's Hall and Schools, Sevenoaks. Mr. E. H. Hill, architect, 3, Lombard-court, E.C.

E. Thurbon, Tunbridge Wells ..... £1,898 0 0  
D. C. Jones & Co., Gloucester ..... 1,898 0 0  
W. A. Grubb, Bromley ..... 1,840 0 0  
W. B. Bunning & Son, Camberwell ..... 1,759 0 0  
H. L. Holloway, Deptford ..... 1,699 0 0  
G. H. Denno & Son, Deal ..... 1,690 0 0  
J. S. Shillito & Son, Bury St. Edmunds ..... 1,690 0 0  
E. Abley & Co., Shepherd's Bush ..... 1,685 0 0  
H. Adams, Tunbridge Wells ..... 1,680 0 0  
R. A. Low, Chislehurst ..... 1,693 0 0  
R. Dornall, Brasted ..... 1,680 0 0  
W. H. Canby, Tunbridge Wells ..... 1,673 0 0  
G. J. Kick, Beckenham ..... 1,567 0 0  
E. H. Lay, Bromley ..... 1,561 0 0  
W. Wiltshire, Sevenoaks ..... 1,556 0 0  
G. Stephenson, Bishopgate-street ..... 1,543 0 0  
R. Aard, Maidstone ..... 1,527 0 0  
W. M. Dabbs, Stamford Hill ..... 1,527 0 0  
G. J. Jones, Tunbridge ..... 1,500 0 0  
J. Hole, Sutton ..... 1,487 0 0  
\* Accepted. † Too late.

TUNSTALL (Staffordshire).—For the erection of a group of Jubilee Buildings, comprising School of Art and Free Library, public baths, fire-engine station, stabling, town hall, &c., for the Tunstall Local Board of Health. Quantities supplied. Mr. A. R. Wood, architect and surveyor, Tunstall.

Contract No. 1.—School of Art and Free Library.  
C. Smith, Tunstall ..... £4,500 0 0  
Cooper & Jones, Tunstall ..... 4,567 0 0  
Bradley & Co., Wolverhampton ..... 4,500 0 0  
W. Cooke, Burslem ..... 4,498 0 0  
C. Cope, Tunstall ..... 4,446 0 0  
J. Bowden, Burslem ..... 4,145 0 0  
T. Goodwin, Tunstall ..... 4,135 0 0  
W. Walkerdine, Derby ..... 4,100 0 0  
J. Grosvenor, Tunstall (accepted) ..... 4,000 0 0

Contract No. 2.—Public Baths and Fire-Engine Station.  
Cooper & Jones, Tunstall ..... £4,560 0 0  
W. Cooke, Burslem ..... 4,412 0 0  
J. Grosvenor, Tunstall ..... 4,350 0 0  
Bradley & Co., Wolverhampton ..... 4,180 0 0  
J. Bowden, Burslem ..... 4,080 0 0  
C. Cope, Tunstall ..... 3,995 0 0  
T. Goodwin, Tunstall (accepted) ..... 3,850 0 0  
W. Walkerdine, Derby ..... 3,870 0 0  
C. Smith, Tunstall ..... 3,400 0 0

Contract No. 3.—Stabling, Town Yard, &c.  
C. Smith, Tunstall ..... £2,160 0 0  
Bradley & Co., Wolverhampton ..... 1,115 0 0  
J. Grosvenor, Tunstall ..... 1,105 0 0  
W. Cooke, Burslem ..... 1,087 0 0  
W. Walkerdine, Derby ..... 1,020 0 0  
Cooper & Jones, Tunstall ..... 1,010 0 0  
J. Bowden, Burslem ..... 950 0 0  
C. Cope, Tunstall ..... 947 0 0  
T. Goodwin, Tunstall (accepted) ..... 927 0 0

WATFORD (Herts).—For alterations and additions to Southfield House, Watford, Herts, for Mr. J. J. Smith. Mr. H. Percy Monckton, F.R.I.B.A., architect, 32, Watbrook, E.C. —  
G. & J. Waterman (accepted) ..... £346 0 0

WAREHAM.—For the erection of stables, coach-house, cow-stalls, covered yard, pigsties, &c., at Organford, Wareham, for Mr. James B. Dugdale, J.P. Mr. W. Watts Fookes, architect, Wareham —  
Knight & Baker (accepted at schedule of prices).

WAREHAM.—For new stables and alterations to the Cove Hotel, West Lulworth, Wareham, for Messrs. Henry J. Tait & Co. Mr. W. Watts Fookes, architect —  
A. Knight ..... £690 0 0  
Reuben Hardy ..... 660 0 0  
John Beer (accepted) ..... 620 0 0

SUBSCRIBERS IN LONDON AND THE SUBURBS, by preparing at the Publishing Office, 19s. per annum (or 4s. 8d. per quarter), can ensure receiving "The Builder" by Friday Morning's post.

#### TO CORRESPONDENTS.

F. D. B. (thanks). J. W. C. W. J. B. — "The Oldest Possible" (we cannot advise on questions of law). — W. B. (The "Griffin" marks the boundary; any portion eastward of that is within the city). — D. A. (correspondents whose letters are not printed always do regard the Editor as a person of honorable want of disinterestedness). — E. & F. (should send amount). — Lists of tenders received too late from G. & R. and W. H.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications. Letters on communications (beyond news items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHERS, and not to the Editor.

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N.B.—The Numbers containing these Illustrations are both OUT OF PRINT.

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STOURBRIDGE BEST FIRE BRICKS, 8 1/2 in. x 4 1/2 in. x 3 in. Ditto FIRE CLAY, 2 1/2 in. x 1 1/2 in. x 1 1/2 in. Also in Stock: Fire Lumps, Fire Tiles, Boiler Settings, and Fire Covers.

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City Office:—72, Palmerston-buildings, Old Broad-street, E.C.

#### BLUE BRICKS.

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# The Builder.

VOL. LV. No. 2374.

SATURDAY, AUGUST 4, 1893.

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### "Short" Quantities.



N the *Builder* for January 21 and January 28 of this year, we published some correspondence initiated by a well-known quantity surveyor, and in which one or two other members of that profession took part, on the subject of "Short Quantities," in which the subject was discussed in reference to a case which had just been decided by Mr. Justice Stephen, the case of "Priestley & Gurney v. Stone." A letter from one of the parties concerned, intimating that the case had been entered for appeal (a fact of which we had no knowledge at the time the correspondence commenced), necessarily put a stop to its further continuance at that time. The judgment on appeal has now been given, confirming the original verdict, and we reprint in another column the report of the rehearing, as given in the *Times*. The letter from Mr. Sidney Young which we published on January 28, and which formed part of the correspondence just alluded to, was mainly occupied in urging on architects, builders, and surveyors the wisdom of avoiding the necessity of bringing such cases before legal tribunals, where the practice of the profession and the building trade was often so little understood and so much misconceived, and of submitting all such disputes to the arbitration of a professional expert, who would be fully acquainted with the nature and bearing of the questions under dispute. The result of the appeal appears to us to more than justify Mr. Young's recommendation. The judgment itself, and the reasons given for it, appear so extraordinarily at variance with the theoretic justice of the case, as it would present itself to professional and business men engaged in the practice of architecture and in the building trade, that it is difficult for the non-legal mind to understand how that can be good law which, in the general principle set up, is such manifest injustice; and at the same time it must be admitted that the unfortunate confusion of ideas which exists at present as to the real bearing of the quantities on the conditions of a building contract, and the real position and responsibility of the quantity surveyor, is brought out into strong relief by the result of this case, which seems

to render it all the more desirable that the theory of the quantities and of the quantity surveyor's responsibility should be placed on a more simple basis of practical working.

It is unfortunate that in this case the defence was not entered into either on the original hearing or on the appeal, the Judges in both cases non-suited the plaintiffs without considering it necessary to hear the defendant's counsel. We are thus left in the dark as to the actual defence which might have been made to the plaintiffs' claim. It was hinted in one of the letters we published that the defence would have been made that the defendant's quantities were not incorrect at all, and that any discrepancy between the amount of work shown therein and the amount which actually had to be done by the plaintiffs arose from alterations in the plans, or in the course of building, after the quantities were made out. If this were so, it would, of course, have been a full defence both in law and justice; and Mr. Stone, in his letter to us on the 28th January, expressly implied that he had been prepared with a full defence of the case on its merits. Our comments, therefore, must not be taken to imply any reflection on Mr. Stone, whose defence, which we have not had before us, may have been a perfectly good one in every sense. But as the judges did not decide on this defence, and did not at all entertain the question as to whether the quantities were really correct or not, we may set this point aside as far as our argument is concerned. The case was decided on other grounds, which are fully set forth in the report on p. 88.

The defendant, who is a quantity surveyor, had been requested (or commissioned, shall we say?) by the architect for a certain building to take out the quantities from his drawings and specifications, of course with the object of obtaining tenders on the basis of these quantities. The law, no doubt, may say "there is no 'of course' in the matter"; but practically all parties know well enough for what purpose the quantities are required. The plaintiffs gave a tender which was calculated on these quantities, and we presume this was accepted and that they entered into contract to carry out the work. We have nowhere seen this stated in so many words, but we may assume it from the report of the case. They maintain that they found the quantities were materially "short," and did not represent the work they had to perform, and declined to discharge the balance of the surveyor's

account for the quantities unless he gave them an undertaking to reimburse them for what they stood to lose through the alleged deficiency in his quantities. Their position in acting thus was, we presume, illegal and irregular—or, at least, it had no legal basis. They eventually sued him for the amount represented by the deficiency in his quantities, and he replied by a counter-claim for the balance of his account. Now, supposing, for the sake of argument, that the quantities were actually short (nothing to the contrary having been assumed by the Court), what are the grounds on which it was decided that the plaintiff's appeal must even in that case have been dismissed? We have, of course, no intention of questioning the interpretation of the law by three learned judges; we do not profess to pronounce any opinion on points of law; what we do think is that in this case the law, or its learned interpreters, did not properly understand the facts before them, and that an arbitrator who was an expert in building would have understood them. The Master of the Rolls commenced by observing that no such action as this had been known before the present case; in other words, there is no precedent; and, as the Master of the Rolls says so, we presume there is not, in law. Mr. Banister Fletcher, however, in his work on "Quantities," cites a case ("Scargill v. Shoppee and another") in which the building-owner sued the quantity surveyor for excessive quantities, by which he had lost. Mr. Fletcher says: "As I was engaged in this case for the defendants and they were successful, I will only say that a very careful examination of the drawings and specifications enabled me to say that there was no just cause of action against them." We gather, therefore, that this case was gained by the defendants because they were able to maintain the accuracy of their work, not because there was no *prima facie* ground of action. It would appear to most persons that—in logic, if not in law—if they could be sued by one party to the contract for excessive quantities, they could be sued by the other party for deficient quantities. We may add that this is obviously the opinion as to the justice of the case on the part of one of the most experienced professional men of the day in matters of practice, Mr. Arthur Cates, who says, in his "Surveyor's Decalogue," quoted, with his permission, by Mr. Fletcher:—"The surveyor is liable to the builder for proved inaccuracies or deficiencies in the quantities, and it is an obligation on



him to prepare his quantities with the utmost care and accuracy, that the client may not suffer by excess, or the builder by want therein." Mr. Cates does not, it is true, undertake to say that the surveyor is legally liable, but he evidently thinks that he ought to be and might be: and that again is the view which a professional arbitrator would probably take of the matter. Professor Kerr, on the other hand, in his book, "The Consulting Architect," says (page 181), in regard to the question of quantities, "The remedy for any inaccuracies, he" [the builder] "will then be told, lies in his right to claim damages from the surveyor; but the unfairness of this in practice is shown by the fact that such damages are perhaps never claimed." Professor Kerr here speaks as if there were a legal right to claim damages, but an unfairness in fact, though we confess we do not see where the unfairness comes in. Mr. Fletcher asserts that the fear of such actions induces surveyors often to take their quantities "full," in order to prevent the chance of, or excuse for an action. It is clear, at all events, that both these writers believe (or did believe) in the power of the builder to bring an action against the surveyor in such a case. However, let us see what is the first point in the legal judgment. The Master of the Rolls says: "The contract as to taking out the quantities was made between the architect and the quantity surveyor, and not with the builders." If this is the law, the sooner an agreement is come to between the law on one side and fact and practice on the other side the better. The practice is that, in the first instance, the architect, in commissioning the quantity surveyor, acts for the building owner, and that the building owner is considered to be liable to the surveyor until the contract is signed, or if the building is not carried out; but as soon as the contract is signed the liability to the surveyor lies with the builder; though, of course, in most cases the payment really comes from the building owner. This arrangement is by no means unfair in itself to the parties concerned; but we can easily understand that it may be one which the law cannot take cognisance of: it may work well enough in fact, but it is cumbersome and illogical in theory, and presents difficulties and anomalies in case of any dispute arising. So far, then, the law has reason on its side; but reason does not seem to go very far in its company. The Judge goes on, "The surveyor is employed to take out the quantities for the architect, and hands them to him, and the surveyor has no control over the way in which the quantities are used." This may be the strict legal aspect of the case, where the architect gives the commission to the surveyor to prepare quantities: indeed, Mr. Fletcher distinctly warns the architect that, in spite of custom, it is safest to obtain the client's consent to commissioning the quantity surveyor, otherwise he may find himself personally liable for the surveyor's charges. Here the law is logical; but here again an arbitrator, whose lands are not tied by the law as those of a Judge are, would award in quite another sense, because he knows well enough that the quantities are not taken out for the benefit or at the special wish of the architect. But the next point in the judgment is, to our ill-gal mind, simply astonishing. "The quantities may not be used at all, and they do not amount to a representation that they are true in fact. . . . The quantity surveyor is not bound to conclude that the bill of quantities will be shown to any one." Such an opinion appears to indicate an entire ignorance of, or an ignoring of, the whole conditions under which, and the object for which, bills of quantities are made out. If that is the only view the law can take of the matter, we can only say that it is no better than a legal quibble, by which the genuine rights of the case are evaded. In regard to the first portion of the sentence, every quantity surveyor who makes out quantities from an architect's drawings knows perfectly well that they are made with a view of enabling builders to tender from them; and if he is not legally bound to know, he is morally bound.


It is impossible to understand how a Judge could have made such a remark had he been aware of professional custom in the matter on which he was deciding. A professional arbitrator would not have listened to such an argument from a party in a case for a moment; he would regard it, indeed, as little better than sheer impudence. And what are we to say to the further statement of the learned Judge, that the bill of quantities "does not amount to a representation that they are true in fact." "Is that the law?" as Shylock says. And if so, is it common justice? nay, is it even common sense? What is the use of the bills of quantities if they are not "true in fact?" They are professedly a means adopted of arriving more accurately at facts upon which considerations of payment are to be based, and which cannot be so accurately arrived at in any other way; the person who draws them up knows that they are to be used for that purpose; and yet we are to be told that in law the sending out of such a document constitutes no representation that it is accurate. If not, it is no better than waste paper; indeed, it is worse, for it misleads people to their pecuniary loss. With all respect to so learned a Judge as the Master of the Rolls, we find it somewhat difficult to believe that in this case he can really have correctly interpreted the law. If he has, all we can say is, so much the worse for the law; and that, whatever the law may be, any quantity surveyor who does not mean his quantities as "a representation that they are true in fact" is a dishonest man, morally if not legally; in which conclusion, indeed, we believe every quantity surveyor of high standing will be with us.

What seems to render the view of the case the more unjust as against those who employ quantity surveyors, is the fact that although the builder could not recover from the quantity surveyor for inaccuracies (assuming that such existed in this case), the quantity surveyor can recover his fees from the builder irrespective (apparently) of the accuracy of his quantities. In the letter which Messrs. Priestley & Gurney addressed to us on January 28, they observe "the judgment really states that the builder is responsible for payment of surveyors' fees, while the surveyor is in no way responsible to him for the accuracy of his quantities." That appears to be the exact practical effect of the judgment. The unfortunate builder is to pay for quantities which are to guide him in the estimates, upon the correctness of which his commercial success depends, but he is to have no security that he gets what he pays for, and no remedy, if the quantities should prove to be inaccurate, against the person who supplied him, because the latter "made no representation that they were correct." Would the learned judges, on the same principle, rule that if a man bought a loaf of bread, and found that it was adulterated with deleterious ingredients which rendered it unfit to eat, the purchaser would have no remedy against the seller, because the latter "did not give any representation that it was wholesome bread?" In most transactions in life it is assumed that when a man sells an article which others require, and are ready to pay for, he sells them what they want, and not merely something which looks like it. But in the case of quantities he may, it appears, sell something which is so different from what the purchaser pays for that it is of no use at all, and even leads to direct loss to the purchaser, and yet the latter is to have no remedy. If this is really the case, some of the standard works on quantities must be revised. To quote again from Mr. Fletcher: "To sum up, it may be said that he who pays for the quantities has his remedy against him who prepared them. There must in law be a payment for work done to enable a person to complain of that work. If, therefore, the successful builder pays for the quantities and they are short—he is not likely to complain if they are full—it would appear he has his remedy, unless something has been said or written to exonerate the surveyor who took out the quantities." Mr. Fletcher is not a

lawyer, and, of course, in law may be wrong; and the fact that there must be payment for a work to entitle any one to make a complaint does not necessarily imply that payment in all cases does so entitle him, but it certainly gives ground for a strong presumption in that direction, and Mr. Fletcher has had so much to do with Quantities cases that we should expect to find that he had some practical grounds for his opinion thus given in a book specially prepared as a guide to quantity surveying.

Of course, we speak with full recollection of the celebrated dictum of an English Judge, "I am not sitting here to administer justice; I am sitting to administer the law." Our contention is this: First, it really does seem open to question whether the learned Judges in this case have not been led, by a misconception of the facts before them, into a definition of the law which they would not otherwise have given, as we find it difficult to believe that the law can really mean that a man is entitled to receive payment for a document, the very essence of which lies in its accuracy, if, through his own incapacity or inattention, it is inaccurate. Secondly, that if the law does state so, steps should be taken to amend it in the interests of common justice; and that it would be desirable for the quantity surveyors themselves, in their own interests, and for the honour of their profession, to make it plain that they, at all events, in giving out quantities which they know well are to be used for estimating, do intend to represent that those quantities are correct, and to abide by that understanding. Thirdly, that if parties in such disputes would appoint a professional arbitrator who understands the subject, they would be far more likely to get substantial justice all round, than by taking the case before legal authorities who do not understand its real merits.

#### "REMNANTS OF OLD ENGLISH ARCHITECTURE."

 UNDER this title Mr. T. Locks Worthington has added another to the numerous collection of books illustrative of ancient architectural remains. As long as they are good, and do not too much repeat each other, there cannot be too many, for to any one who takes a real interest in architecture, whether as an architect or as an amateur, there can be no more delightful possession than a library of books illustrative of ancient architecture. The best among them form at once examples of fine drawing, and often of picturesque effect, records of the work of past ages, and suggestions for the work of the future; we turn over their pages lovingly, and find in them a pure enjoyment of architectural design and architectural history which is a welcome change and repose from the prosaic and often irritating accompaniments inseparable from the actual practice of architecture as a profession of the present day.

Mr. Worthington's book is not among the illustrative works of the first class in regard to scale and execution, nor in regard to the interest of the subjects treated, which are somewhat miscellaneous, but it is an interesting and picturesque volume, and contains some very well-executed drawings; and there is a certain point given to the publication in the preface, as being a kind of protest in favour of doing more justice to the architectural remains of one's own country. It is true that many persons run away to the Continent to look at and draw architectural remains there, who have paid little attention to work in England. It can hardly be said, however, that English architectural remains have not received their fair share of illustrative publication. The fact is that, the area being limited as compared with that of the Continent, such a large proportion of the English architectural remains have been measured,

\* Remnants of Old English Architecture. thirty-five Plates of Measured and Perspective Drawings. By T. Locks Worthington, A.R.I.B.A. London: Sprague & Co. 1888.



sketched, and otherwise illustrated, that a majority of those who wish to produce books of architectural illustration go abroad, as having the better chance there of finding things which have not already been published. Nor is there in Mr. Worthington's book very much that has not been illustrated, and illustrated rather often. Some of the books which are in all architectural libraries are, however, now out of print and not to be had, so that new illustrations fill a gap for the younger generation of collectors of works of this kind.

Mr. Worthington has bestowed the fullest attention in his work to the remains of Wenlock Priory, to which he devotes two double-page and six single-page plates, and which is very completely illustrated by measured drawings, a large collection of mouldings, and occasional perspective sketches. There has been, we believe, no book published in illustration of Wenlock Priory since the essay by Roberts in 1862, which is probably not in print now. The remains have, however, been a good deal measured by other architects or students recently. Mr. Worthington gives a complete ground-plan of the remains, shaded differently to show the parts still standing to any height, and those of which the foundations alone are left, with dotted indications of piers and other portions of which there is no actual trace left. The portions standing are given in measured elevations, with a larger-scale drawing of the south transept; and one example is given (Plate V.) of the combination of geometrical measured drawing with shadowed effect, of which the French architects are so fond, and which is one of the best means of showing both the actual lines and pictorial effect of a building. This is an "ink-photo" from a shaded section of the south transept, showing the interior elevation of the end wall. We have selected two of the Wenlock Priory plates for publication as examples of the work in the book (see lithograph illustrations)—one of them containing a number of detail sketches, with a general view of the remains and a measured elevation of the Chapter-house entrance; and the other giving the measured drawings of the interior walls on the north and south sides of the Chapter-house. The Chapter-house is the only portion remaining of the first Norman building (the foundation of the Priory was before the Invasion), and the interlacing arch work on the walls is a curious and rather unusual example of the application of this form of ornament over an expanse of wall, instead of as a mere longitudinal arcade. The Chapter-house had the three arches opening from the end cloister, usual in Norman and Transitional Chapter-houses, as shown in the elevation on the other plate. The view given in the middle of this plate shows in the distance the remains of the south transept and the Chapter-house entrance, from the north aisle of the nave; but the circular base of a pier in the foreground does not keep its place quite in regard to proportion with the rest of the drawing; it is drawn with almost as much delicacy as the more distant pier on the right, and consequently looks too large in scale in the drawing. This sketch, and some of the measured elevations of Wenlock, have suffered a little from reduction to too small a scale in photographing.

A detail of one of the windows and some of the carving from Stone Church make a very good Plate (IX.). In the small and neat perspective drawing of part of Pershore Abbey (XIII.) the effect is a little too hard, from the too-decisive drawing of lines at the external and re-entering angles of buttresses, &c.; the measured drawings are, in fact, the best portion of the work; the author's touch and feeling in perspective drawing will bear some further cultivation,—at least as to pen drawing. The water-colour drawings, reproduced in ink-photo, are much more satisfactory in artistic effect. Among them are a view in the porch of Cartmel Church, Lancashire, some street-scenes in Bristol and Gloucester, and some good sketches of Stokesay Castle, done in line and touched with brush shading. "Harvington

Manor" (Plate XXIV.), another of the ink-photos from a brush drawing, is an interesting example of a half-timber house. There are a good many small pen sketches of old houses from various towns, which are well selected and interesting as illustrations, but not so pleasing as drawings, owing to their rather scribbly style of execution and lack of effect.

A very good ink-photo drawing is given of part of Chester Cathedral, from the cloister court; but when the author describes this in the text as a drawing "illustrative of the Rectilinear style," he is fully alive to the fact that almost every detail in this view, if we remember rightly, is modern work merely faced on to the original walls? There is no indication in the text that it is not given as old work.

# NOTES.

**T**HE Railway and Canal Traffic Bill passed the third reading in the House of Commons last week, amid general congratulations. Mr. Mundella, in appealing to the House not to make any further alteration in it, described it as a good and workable measure; and he has since stated that, in his opinion, it is the best piece of work that has been done for the last two years. Mr. Bolton, who has done his best to safeguard the interests of the railways during the passage of the Bill through the Lower House, also admitted that it was in a better condition than he had anticipated. If we may judge from Mr. Parke's speech at the Great Eastern half-yearly meeting, on Friday last, the gloomy forebodings of the companies with regard to the Bill have given place to a complacent resignation, if not satisfaction. The Great Eastern chairman "does not apprehend that much harm will accrue from it." There was yet one more attempt to get some provision imported into the Bill "protecting" the interests of North-Eastern ports. Some hon. members look upon it as a certainty that "transit" traffic between the northern ports of Germany and the northern ports of America (which passes across this country between Hull and Liverpool) will be absolutely killed by the clause forbidding preferential rates. The Government do not believe that this danger exists, and, after a good speech from the Attorney-General explaining their intention with regard to the clause, it was allowed to stand without alteration.

**T**HE following cities and towns are made Counties by the new Local Government Bill, to each of which we have added its population at the last Census, viz. :—

|                         |        |                     |         |
|-------------------------|--------|---------------------|---------|
| Canterbury .....        | 21,704 | Rochdale .....      | 68,866  |
| Boole .....             | 27,374 | Halifax .....       | 73,630  |
| Worcester .....         | 53,856 | Plymouth .....      | 73,794  |
| Gloucester .....        | 36,521 | Wolverhampton ..... | 75,766  |
| Chester .....           | 36,794 | Croydon* .....      | 75,993  |
| Lincoln .....           | 37,318 | Derby .....         | 81,168  |
| Exeter .....            | 37,665 | Huddersfield .....  | 81,841  |
| Reading .....           | 42,054 | Cardiff .....       | 82,761  |
| Coveentry .....         | 42,111 | Birkenhead .....    | 84,006  |
| Dudley .....            | 42,258 | Norwich .....       | 87,842  |
| Great Yarmouth .....    | 43,159 | Preston .....       | 95,537  |
| Hastings .....          | 46,252 | Blackburn .....     | 104,014 |
| Barrow-in-Furness ..... | 47,100 | Bolton .....        | 105,414 |
| Wigan .....             | 48,194 | Brighton .....      | 107,546 |
| Hanley .....            | 48,361 | Oldham .....        | 111,343 |
| Devonport .....         | 48,939 | Sunderland .....    | 116,542 |
| York .....              | 49,530 | Leicester .....     | 122,376 |
| Ipswich .....           | 50,546 | Portsmouth .....    | 127,989 |
| Bath .....              | 51,814 | West Ham* .....     | 128,953 |
| Northampton .....       | 51,881 | Hull .....          | 154,240 |
| Bury .....              | 52,213 | Newcastle .....     | 145,359 |
| Middlesbrough .....     | 55,934 | Salford .....       | 176,235 |
| West Bromwich* .....    | 56,295 | Bradford .....      | 183,032 |
| South Shields .....     | 56,875 | Nottingham .....    | 186,575 |
| St. Helen's .....       | 57,403 | Bristol .....       | 206,874 |
| Burnley .....           | 58,751 | Sheffield .....     | 284,508 |
| Walsall .....           | 58,795 | Leeds .....         | 309,119 |
| Stockport .....         | 59,553 | Manchester .....    | 341,414 |
| Southampton .....       | 60,051 | Birmingham .....    | 400,774 |
| Swansea .....           | 65,597 | Liverpool .....     | 552,508 |
| Gateshead .....         | 65,803 |                     |         |

\* These three have been incorporated as boroughs since the date of the last Census. The population above-named is that of the previous Urban Sanitary District in each case.

**F**ROM the Calcutta correspondent of the *Times* (July 30) we learn that the last Simla *Gazette* contains the exposition of a policy of sanitation reform, progress in regard to which appears to have been checked hitherto, as every one who knows anything of native prejudices would easily understand, as much from the ignorance and conservatism of the mass of the people as from want of executive agency. In fact, we may take it that executive sanitary agencies would have been practically almost inoperative through the impossibility of getting people to understand or obey their regulations. It seems to be now thought, by those who know the country, that public enlightenment in India has progressed so far as to render some official attempt at sanitary reform possible. We gather from the brief *résumé* of the Calcutta correspondent that it is proposed that urban and rural sanitary districts should be formed, and that a sanitary board should be established in each province, through which the local government can operate, for the control and supervision of all sanitary works. The commissioner of a district would also be an *ex-officio* member of such a board. We shall hope to hear more before long of this new departure on the part of the Indian administration.

**T**HE announcement that the London and North-Western Railway Company had determined to still further accelerate their morning train to Edinburgh, reducing the journey to eight and a half hours, as against the old ten hours, has (of course) been followed by the announcement of a similar acceleration in the Great Northern service to Edinburgh, which is to be reduced by this company to eight hours. The "L. & N. W. R." undertakes an average speed of forty-seven miles an hour, the "G. N." one of forty-nine miles an hour. Unless stoppages are considerably reduced in number or in the time allowed, which is not very likely, these figures, of course, mean a much higher speed over the road than the nominal speed above named; but if the acceleration is judiciously carried out, we do not think the nervous traveller need be under any alarm. The acceleration, if it is to be made by actual increase of running speed, need only mean that a speed which is now frequently attained in certain parts of the route would be distributed more generally over the whole route, as far as inclines permit. The speed of the L. & N. W. R. Scotch trains is often, for a considerable portion of the route, very moderate for these days of improved locomotives and roads, and would bear considerable addition without arriving at an apparently dangerous limit. No doubt an increased consumption of coal will be required to maintain over the whole route, or over a greater length of it, the speed daily attained in certain portions, and the drivers would have to aim at climbing gradients at a higher speed than before, which would unquestionably mean the arrangement of "coal premiums" on a fresh basis. There may, however, come a period, in the race between the two railway companies as to who shall be fastest, when the interference of the Board of Trade would be desirable; for if the limits of safety in speed are not yet overpassed, there is great temptation to overpass them if this game of out-bidding one another in speed is to go on unchecked. The Midland Company, which has been usually considered as specially enterprising in character, has not joined the move for acceleration so far. Whether this is due to the fact that the character of certain parts of the Midland route renders any great acceleration of speed obviously dangerous, or that the Midland Company is aiming at the policy of representing theirs as a specially safe route in which no racing is countenanced, who can say? If the other two companies go too far in their racing game, the "safe" policy may turn out a paying one in the long run.

**T**HE monument to Sir Herbert Stewart, which was unveiled by Lord Wolsley on Friday last week, but which we found this



week again closed in from public view for some further working on it, is a bronze bas-relief, in very low relief, forming a broad band below one of the windows on the north side of the nave. The bronze follows the curve of the base of the small semidome, but does not fill the whole curve, as the space at either end has been already occupied by two bas-relief panels in marble, monumental carvings which have been there for a good many years. It would have been more in keeping with architectural requirements and decorative effect if the new memorial had been executed in marble also, instead of inserting a bronze bas-relief between two marble ones. We should have thought this would have been a point Mr. Penrose would have seen to, but we regret to learn that Mr. Penrose is little consulted on matters on which his advice would often be very valuable, and on which we should have thought it came within the responsibilities of his office to advise. The bronze, designed by Mr. Boehm and executed in bronze by Mr. Barnard, consists of three panels, the centre one containing a bust portrait of Sir Herbert Stewart in a circular medallion. Mr. Boehm has been trying the same kind of experiment that Mr. Natrop has been trying with Mr. Browning's portrait, of treating a full face in very low relief. We cannot say we think the system satisfactory. Bas-relief in low relief is better suited for a profile portrait: in a front face it is impossible to get over the impression of the face having been compressed. The rest of the work contains no details of any great beauty or significance. The monument to Gordon, erected by his brother, which has been there for some time, was first given to public view on the same occasion. It is a bronze recumbent figure on a pedestal, in sarcophagus form, of black marble. The figure, which is simple and dignified, is also, we believe, designed by Mr. Boehm. The monument stands in front of the window recess, on the chord of its apse, or nearly so. The inscriptions are on brass affixed to the black marble, with good decorative effect, and the whole monument is in good taste, the peaceful expression and attitude of the figure contrasting strangely with the troubled life of the hero it commemorates. On other than artistic grounds, at least, this corner of the cathedral should be dear to all high-minded Englishmen. The following is the inscription on the brass plate on the side of the monument facing the nave:—

"To Major-General Charles George Gordon, C.B., who at all times and everywhere gave his strength to the weak, his substance to the poor, his sympathy to the suffering, his heart to God. Born at Woolwich, 28th of January, 1833, slain at Khartoum, 26th of January, 1885. He saved an Empire by his warlike genius, he ruled vast provinces with justice, wisdom, and power, and lastly, obedient to his Sovereign's command, he died in the heroic attempt to save men, women, and children from imminent and deadly peril. 'Greater love hath no man than this, that a man lay down his life for his friends.'"

CONCURRENTLY with the thorough repair of Crowland Abbey\* we read that it is found necessary to begin a restoration of the neighbouring abbey of Thorney. This ancient minster stands upon an elevation of the Drift and Lower Green Sand by the Morris and Fish Pans in the north-western corner of the Isle of Ely. Thorn-eye, like to El-eye, lay near to the Roman stations at Durobrovis, (Caistor, on the Nene), and Camboritum (Cambridge), in a district which had been held by the Iceni, whose capital was at Norwich, and whose war-path the Icknield-way. The Romans having departed, the Britons made good their stand here until dispossessed by the Gyrrwas from Engleland: circa, 550 A.D. The Gyrrwas remained in the Fens: their kindred tribe, the Lindisvaras, settled in the Woods of Lincoln. Uffa, overlord of East Engla, took up his residence in, and fortified Norwich (571-8); and there Anna, with others his successors, kept court. About the time of the death of Tundbercht,

Earl of the South-Gyrrwas, whose widow, Æthelthryth, daughter to Anna, founded (673) the convent at Ely, a retreat for anchorites was established in Thorn-eye, hence also known as Ankeridge. This was done by Saxulph, first abbot of Medehamstede (Peterborough), with the aid of Wulfhere, Lord of Mercia, and brother to Peada, who is reputed to have founded that monastery. The anchorites were dispersed, and their settlement was burned, by the Danes. About one hundred years later, Æthelwold, Bishop of Winchester, refounded Ely and Thorney as well. The latter he dedicated to St. Mary the Virgin, for monks Benedictine (972), whereof the abbots in course of time attained to high eminence, and sat in Parliament. It was to these fens that Morkere, Earl of Northumbria, repaired to join Hereward the Wake in his final resistance against the Conqueror, when the last hope of England died with the surrender of Ely (1071). King John granted the patronage of Thorney to Eustace, Bishop of Ely, and his successors. At the Dissolution its yearly revenues amounted to 411*l.* 12*s.* 11*d.*, according to Dugdale; Speed estimates them as 508*l.* 12*s.* 5*d.* Most of this property, together with the monastery site, was given in 3 Edward VI. to John, first Earl of Bedford. The Russells, who formerly lived at Thorney, continued the monks' good work, as eulogised by William of Malmesbury, in draining and cultivating their low-lying lands. This enterprise, wherein Cornelius Vermuyden played his share, is commemorated by the name of the great "Bedford Level." The minster had been rebuilt in 1128; in 1638 the nave was converted to parochial uses; and about forty-seven years ago the church was enlarged, after Mr. Blore's designs, at the cost of the Duke of Bedford, in whose honour the tenantry subscribed for a fine organ. Many of the parishioners are descended from Walloon and French *émigrés*, and a register was kept, for a while, in the French tongue. With Thorney may be compared a parish of that name in Nottinghamshire, the hamlet by Langport in Somerset, and the ancient designation of the site of West Minster.

THE recent presentation of the Gold Medal of the Institute of British Architects to Herr Hansen seems to have been much appreciated both in his native country, Denmark, and in Vienna, of which city Herr Hansen is now practically a citizen. The Viennese architects gave the recipient of the English gold medal a banquet in honour of the event.

A QUESTION by Lord Meath, in the House of Lords last Monday night, elicited from Lord Henniker the information that a sum of money has been placed at the disposal of the Government by an anonymous donor for the purpose of laying out temporarily as a garden the waste wilderness to the west of the Law Courts, which ought to have been so laid out long ago. By "temporarily" we mean until the ground may be required for the extension of the Law Courts, when, of course, the garden would have to be disestablished, partly or entirely; but it may very likely be many years before this necessity arises, and we are very glad to hear that we are not to have the ground left in its present unsightly state for all that time. The thanks of the public are due to the anonymous donor whose liberality has induced the Government to do at last at private cost what they ought to have done themselves long ago. It is gratifying to add, considering the indifference, and even contempt, with which architectural assistance in the matter of laying out or beautifying London is usually regarded by the Government, that in this case the ground is to be laid out "in accordance with a plan prepared by Mr. Street, the architect of the Law Courts," though it does not clearly appear, from this statement, whether we are to understand that it was the late Mr. Street who left a plan for laying out the grounds, or the present Mr. Street who has specially prepared one.

THE first fire inquest under the Act which was passed this session was held last week, but the jury were unable to arrive at a conclusion as to the cause of the fire. This is a very frequent result, as we all know, of the deliberations of a jury; and though it is satisfactory that some special machinery now exists to inquire into London fires at which life has not been lost, yet it is very doubtful whether the jury is either necessary or desirable. The inquiries into shipping casualties, as well as into mining disasters, are always held by inspector, wreck commissioner, or magistrate. Very beneficial results have followed from these inquiries, and, in our opinion, it is very doubtful whether fire inquests will have any practical result, unless they are conducted on lines similar to those of inquiries into casualties at sea.

IN reference to our recent article on Sir Henry Roscoe's reports to the Board of Works, Dr. Dupré sends us some correspondence dated five years back between himself and Sir J. Bazalgette and Dr. Dibdin, showing that he had at that date strongly urged the expedient of mechanically aerating the sewage "between the pumping-station and the reservoirs, and perhaps again between the reservoirs and the river." We have not space to print the letters, but as Dr. Dupré wishes to have it known that this expedient was strongly and repeatedly urged by him on both the Engineer and the Chemist of the Board some years ago, we willingly testify that the letters he has placed in our hands bear out this claim. Dr. Dupré, however, appears to have contemplated aeration in conjunction with chemical treatment, not in entire substitution for it.

THE *Indian Engineer* for July 4 commences an account (to be continued in another number) of a series of tests applied to the Hooghly Jubilee Railway Bridge to account for some movements which it evinced when trains passed over it. The account is a long one, and is illustrated by a number of diagrams shewing the resulting strains and displacements when the bridge was loaded at one end. The bridge is a double cantilever, with two piers under the centre portion.

IT is well known that the officials of the Post-office invariably interpret their instructions as to surcharges in a strictly literal manner. A point which has given rise to considerable annoyance is the surcharging upon postcards the original address on which has been altered. In accordance with the regulation under which all writing besides the (actual) address is excluded from the stamped side, persons who have corrected an inadvertent error in the name of a street have thereby subjected the receiver to a penalty. A case of this nature, in which the pound of flesh was exacted after a strong protest, has led to the subject being reconsidered by the Postmaster-General, who has now instructed postmasters that, for the future, a postcard need not be charged for any alteration which is evidently a mere amendment of the address, it being perfectly clear that the card had not been previously used. This is satisfactory; for, although it may appear a very trifling matter, friction between the public and public servants is often productive of an amount of irritation quite out of proportion to the amount involved, and it is highly desirable that the occasion for such unpleasantness should, if practicable, be removed. The absurd and vexatious manner in which this regulation about postcards used to be enforced was admirably illustrated in one case that came under our notice, where a postcard was sent to make an appointment for ten in the morning, and the word "Immediate" written on the top, in order that the card might be immediately sent on if the receiver had left the house before it arrived. At two p.m. the card, making an appointment for four hours previously, was sent back to the writer with the announcement that it could not be delivered without an extra fee, because "Immediate" was no part of the address.

\* See the *Builder*, June 23rd, 1888.



THE Burstow Park estate, Surrey, will be offered for sale at the Mart on the 29th inst. This property, of nearly 900 acres, lies under the Nutfield hills, on the borders of Sussex, two miles and a-half south-east of Horley, and seven miles distant from Reigate. The sale will include the old manor-house, with its farm-buildings, and the Stonehouse farm, with its cottages, &c., as also some separate lots—about 100 acres in all—of enclosures, houses and gardens in the immediate neighbourhood, and the Burstow Hunt kennels. The parish of Burstow extends over 4,760 acres, and was formerly a "peculiar" of the province of Canterbury.

AT the sitting of the Board of Works Commission on Tuesday, Sir J. Bazalgette, who was recalled and asked some questions as to the work on the Thames Embankment, appears (if his answers are correctly reported) to have adopted a rather easy idea as to an engineer's responsibilities in looking after an important piece of work. The question was whether or not mere rubbish had been used as part of the filling for the Embankment:—

"Are you aware that people paid the contractor for being allowed to deposit rubbish there?—I know nothing of that; but, speaking from recollection, I believe there were a few cartloads paid for. Others came from a distance, where the contractor paid for them. Of course, that was a matter I had nothing to do with. The specification showed that part of the filling-in was to come from the land and part from the river Thames."

Sometimes considerable sums are paid for permission to deposit rubbish!—It depends on the distance that it has to be carried. It is a matter as to which I, as engineer, should not interfere in the least."

That the work, as completed, has been satisfactory no one contests, but does Sir J. Bazalgette mean to affirm that, in the case of a great operation of embanking for a permanent roadway, it is no part of the engineer's duty to know what sort of stuff is being used for the filling, or to interfere to prevent the use of unsuitable material? And is that the view of the engineering profession generally? That Sir J. Bazalgette did not consider the use of ordinary "rubbish" filling satisfactory is obvious from his insisting on the fact that "only a few cartloads" were used. How, then, is it a matter "in which, as an engineer, he would not interfere in the least?"

THE death of Mr. Frank Holl, at the early age of 43, leaves a sad gap in the ranks of our foremost portrait-painters. Mr. Holl's portraits were, no doubt, open to the charge of being mannered, chiefly in respect to a peculiar trick of lighting which nearly always recurred in them, and it may be that the place they will take in the art has been rather over-estimated by some of those who were naturally carried away by the force and brilliancy of expression and effect which characterised nearly all Mr. Holl's portraits. If they were not in the first rank of portrait-painting, however, they were at the head of the second rank, and every year seemed to add to the artist's best qualities and diminish his mannerism. The amount of good work which he has produced in so short a life says everything for his energy and power of ready insight into the problem of portrait-painting.

THE proposed visit of the Architectural Association to Professor Herkomer's house and schools at Bushey, which was announced in our list of meetings as for Saturday last, had to be given up on account of the sudden death of Professor Herkomer's father. Many who knew the deceased personally, and others who knew him by repute, will regret to hear of the death of a man of noble and independent character, who was much respected. Mr. Herkomer was a wood-carver, working with his own hands, and taking a pride in his craft, and an interest in many things beyond. His portrait, painted by his son, has been recently exhibited in the "New Gallery" exhibition.

THE first number of *Artistic Japan*, published in May,\* and announced as "a

monthly illustrated journal," does not appear to have been followed up by any publication in June or July. Whether this is only a temporary delay or an admission of failure we know not. The first number contains illustrations of various very pretty bits of Japanese diaper design, not differing much in character from a great many more of such designs with which we have been familiarised of late years, and it includes a beautiful chromo-lithograph reproduction of a sheet of highly-tinted bird studies, of the class of which many fine examples are now to be seen in the British Museum—a branch of work which shows the Japanese artist at his very best. The same number contains things which serve to illustrate the uncritical spirit in which all things Japanese can be swallowed wholesale by those who have trained themselves up in this direction. There is a chromo-lithograph of a landscape or sea-coast view, for example, which, from the point of view of European landscape painting, is simply childish, and nothing better than a tea-tray painting. And this is to be called "art," forsooth, because it is done by a Japanese!

#### LETTER FROM PARIS.

THE National Fête, which is the pretext every year for a distribution of crosses of the Legion of Honour, has this year specially favoured architects. Among the names of the newly "décorés," published in the *Journal Officiel* of July 14, are those of M. Laloux, the young architect who exhibited, in 1885, such an interesting restoration of the Altis of Olympia; M. Boileau, the architect of the Gambetta monument; M. de la Roque, diocesan architect of Beauvais and Nevers, and for sixteen years Professor at the École Nationale des Arts Décoratifs; and M. Gallois, architect of the "Assistance Publique de Paris" and of the "Mont de Piété." One cannot but felicitate M. Lockroy on having paid a little more attention to artists than is usual in these official lists of honours.

As has been recorded in the daily papers, the Government took the opportunity of the annual fête to invite the Maires of all the principal towns of France to a great banquet in the gallery of the "Expositions Diverses" of the Exhibition buildings, at which 3,000 persons were seated. Without going into the details of this gigantic reception, we may mention the fine effect of the great nave adorned with quantities of foliage and splendid Gobelin tapestries, and illuminated by electric light. Thanks to the care and zeal of M. Alphand, the affair was a complete success.

In connexion with the Exhibition a large wharf is being constructed on the river bank, above and below the Pont de Jéna, to be completed in about five months, and which is to form a landing-place for objects or products intended for the Exhibition. In the midst of the river also, at the extremity of the Ile de Grenelle, a great pedestal is being built to receive the statue of Liberty presented by the American colony in Paris, a bronze statue which is a replica of the one at New York. The statue will stand eleven metres in height, and the cost of the pedestal will be about 78,000 francs.

In reference to the Exhibition, it may also be mentioned that the Government intend to appoint, to take part in the International Congress of Architecture in 1889, a certain number of French architects as national representatives. Among the most prominent are MM. Bailey, Boswilwald, Chipiez, César Daly, Daumet, Chas. Garnier, Hermant, Chas. Lucas, E. Monnier, A. Normand, Sédille, and Paul Wallon. M. Antonin Proust has been named Special Commissioner of the Fine Art Section of the Exhibition.

The jury have given their award in the second competition for the decorative painting of suburban Mairies of Arcueil-Cachan and Nogent-sur-Marne. When the first competition was decided, three months ago, three artists were selected to compete finally for each of the buildings, MM. Baudouin, Bramtot, and Vimont for Arcueil, and MM. Debon, Léonhardt, and Ary Renan for Nogent. The second trial has been a failure for the three last-named artists, who have sent in very feeble works, and the premium has not been awarded. The result of the Arcueil competition is not very much better; but the jury have, nevertheless, decided

in favour of M. Baudouin, whose work is a reminiscence of the manner of M. Pavis de Chavannes, but without the fine effect of light and breadth and simplicity of composition which distinguish the works of his model.

There is to be another painting competition shortly for the decoration of the Mairie of the 14th Arrondissement, the enlargement of which by M. Aubartin is nearly completed, and a competition in sculptural and architectural design is also to be shortly held, with the view of evolving a monument to the memory of Danton. The effigy of this melancholy hero of a day of violence is to take the place of the statue to Broca, near the Faculté de Médecine, and 60,000 francs have been voted for this somewhat unseasonable memorial.

The Municipal Council, on the other hand, have decided to accept the offer of Dr. Evans, an American, to erect at his own cost an equestrian statue of Lafayette. The site is already chosen, but the work itself is still to be designed. According to report, an old statue by Clésinger is to be adapted to this new destination, with a benevolent intention of benefiting the present representatives of the artist. If it is so, it is rather a poor scheme, and the statues of Hoche and Marceau, also by Clésinger, which have long faced the weather in the Champ de Mars, are not of such excellence as to make one desirous to see Clésinger's work further illustrated.

After many years the Carnavalet Museum is at last completed. A new building, designed by M. Bouvard, now flanks the Rue de France-Bourgeois, and encloses the "Arc de Nazareth," that fine specimen of the art of the Renaissance of which we have before spoken, and which will be fenced in by a wrought-iron grille. This gallery, intended for old pictures illustrating the history of Paris, will be a useful complement to collections of other antiquities in the Carnavalet, which are quite distinct in character from those of the Musée d'Auteuil. The latter embraces the modern collections; those of Carnavalet illustrate the history of the past.

The engineers of the Municipality are pushing on vigorously the iron viaduct which is to cross the cemetery of Montmartre to prolong the Rue Caulaincourt to the Boulevard Clichy. This carrying of a road across a burial-ground has caused some outcry at it as a profanation of the resting-places of the dead, especially in a city where what may be termed the "Culte des Morts" is carried to excess; but the Administration has taken every pains to avoid all actual disturbance of graves or monuments. The viaduct will be furnished on each side with very high bulwarks of iron standards and cross-heads, filled in with an iron trellis so close as to prevent either climbing over or the throwing of stones through it, which might injure the monuments.

We are also to have soon a rope traction railway from the Place de la République to the heights of Belleville. This work, which will cost about a million francs, is to be carried out by the Municipality. If this experiment succeeds, a second similar railway is to be made to the heights of Montmartre.

It must be admitted that the City Government of Paris shows a thoughtfulness for public good, and a spirit of initiative, which we do not find in connexion with work done under State control. This is exhibited not only in practical improvements, such as we have just alluded to, but in work for the intellectual advancement of the people, as in connexion with the important work of artistic instruction. In the State Lycées, the pupils have only two drawing lessons a week, or a total of eight hours per month, which is quite insufficient for any practical result. The course of instruction, too, is only optional, and can be dispensed with on a simple attestation of the parents. Music and singing are taught in the State schools as extras only, and on payment of a special fee over and above the already heavy school expenses.

On the contrary, in the primary and free schools of Paris, the teaching of singing, drawing, and modelling is obligatory, and given by certificated professors, selected by competitive examination, and subject to the constant control of inspectors.

It may be of interest to give some details on this subject, which will show the progress made in Paris, thanks to the exertions of Viollet-le-Duc and of M. Greard, Rector of the Academy, in the popular instruction in drawing, which commences from the École Maternelle—where it precedes even the teaching of writing, and is continued in the primary elementary schools

\* Sampson Low & Co.



for boys and girls, and is carried on from the round in the superior elementary schools, where four hours a week are devoted to it. In these latter schools the course includes drawing from the round, geometrical drawing, and architectural drawing. Lastly, special classes for drawing and modelling are open every evening from 8 to 10, in a certain number of the "Ecoles Communales," for young apprentices and for adults. The teaching of adults includes geometrical drawing, mechanical drawing, architectural drawing, stereotomy, and water-colour drawing. The number of these classes now organised is 63, and they are attended by about 4,000 pupils.

In order to afford to girls and young women who are in training for industrial or artistic occupations a complete instruction in drawing, the municipality subsidises a certain number of free schools of drawing for women. There are fourteen of these schools. This is not all; to mark further the interest which they take in this class of instruction, the city authorities organise an annual competition between all the pupils of the primary elementary schools, with prizes of books, &c.; and other annual competitions take place between the pupils of the subsidised schools and of the evening classes. The prizes for these are books, medals, or money for travelling expenses ("bourses de voyage"), enabling those who show special ability to make a tour for study in France or abroad.

Lastly, in order to organise an instruction in the practical application of drawing, there have been established a few years since two new schools—one a preparatory school in the preparation of drawings for special objects, the other for the application of drawing to a certain number of industries.

In the first of these two schools, situated in Rue Ste. Elizabeth, and under the direction of M. Jobbé Duval, the painter, the instruction includes applied mathematics, drawing from the round and from the life, sculpture and decorative painting, architectural drawing, the composition of ornament, and the study of art history. The second school, in the Rue des Petits Hôtels, is a kind of complement of the first. It includes three ateliers, one for ceramic art, one for engraving, and one for designs for textiles and furniture. The results obtained by these two establishments have been, so far, very satisfactory, and the creation of new ones in other quarters of Paris for the application of design and drawing to other industries is under consideration. These schools, if started, will be organised with special reference to the industries most prominent in the quarters in which they are established.

We will complete the account with a few figures:—

|                                                                                                                                                                | France.   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| The cost of the personnel and material for the teaching of drawing in the primary schools and in the evening classes is stated in the Municipal budget as..... | 817,600   |
| The school in Rue Ste. Elizabeth represents an expenditure of.....                                                                                             | 41,875    |
| The school in Rue des Petits Hôtels represents a cost of.....                                                                                                  | 55,300    |
| The gratuitous instruction in drawing given annually to children and adults in Paris amounts therefore to a total of.....                                      | 1,014,775 |

Returning now to superior instruction given by the State, we may mention that M. Marcel Lambert, who is a diplomate architect and holder of the Prix de Rome, has been appointed to replace, at the Ecole des Beaux Arts, the vacancy caused by the lamented death of M. Durand Claye, the late professor of stereotomy.

In the competitions which have just taken place for the Prix de Rome, the subject in painting, given by M. Gérôme, was "Ulysses and Nausicaa." The competition was a very poor one, and neither "Grand Prix" nor "Premier Second Grand Prix" were awarded, the jury contenting themselves with giving a "Deuxième Second Grand Prix" to M. Elliot, a pupil of M. Cabanel, and a "mention" to M. Paul Buffet, pupil of M.M. Boulanger and Jules Lefebvre. The sculpture competitors had for subject (given by M. Paul Dubois) "Orestes at the Tomb of Agamemnon," on which the jury had not decided at the time of writing, nor has the decision on the architectural prize been yet given; the subject was "A Parliamentary Palace."

M. Oscar Roty, the designer of so many beautiful medals,\* has just been elected a member of the Académie des Beaux Arts ("Section de Gravure") in place of the late M. Bertinot.

M. Roty, who studied under M.M. Dumont and Ponscarme, has already received many medals and official honours in the course of his career.

We have to record the death of two artists of great ability, M. Antoine Etex, the sculptor, and M. Alphonse François, the engraver.

Etex had been a pupil of Dupaty, Pradier, Ingres, and Duban, and was thus entitled to call himself at once sculptor, painter, and architect, though his reputation was gained as a sculptor. He has left works of great merit, especially two of the groups on the Arc de l'Etoile, the monument to Gericault, which obtained a great success in the Salon of 1841, that to Lionville in Pére la Chaise, the group of the "Naufragés" which adorns the park of Montsouris, and the monument raised at Montauban to the memory of Ingres. The Luxembourg Museum possesses several of his works—in particular a painting which is little inferior to his sculpture. He was born in 1808, obtained the Prix de Rome in 1820, a "première médaille" in 1833, and the Cross of the Legion of Honour in 1841. He had also made himself known in literature, and published a remarkable essay, "Sur le Beau."

Alphonse François, whose modest and silent labours contrast curiously with the exuberance of Etex (who was by no means remarkable for self-effacement), died at the age of 77. He was best known for his engravings of the works of Delacroix. He made his *début* at the Salon in 1842, with an engraving after a portrait by Titian. He also obtained various honours and medals, and was an officer of the Legion of Honour. In 1873 he replaced M. Forster at the Académie des Beaux Arts.

P.S.—It is since the above remarks were written that there has arisen the important strike of the excavating workmen, or "navvies," which now numbers more than 8,000 adherents. The strikers, who refuse to accept the official wage-list of 1882, wish to work no more than nine hours, and demand 60 centimes per hour in place of 45. They are strongly supported by the artisan party in the Municipal Council, who solicited a subvention of 10,000 francs for the strikers, which the Council, by a large majority, refused.

The strikers are collecting every day in the Bourse du Travail, rue Jean Jacques Rousseau, and at every meeting there are furious declamations against the masters, and "orders of the day" of the most inflammatory description, but there has been no serious breach of the peace as yet. At several quarters, nevertheless, especially in suburban districts, the gendarmes and infantry have been obliged to intervene to protect the men who refuse to join the strike.

It should be added that the foreign element is very predominant among the workmen on strike, and the Government is resolved to expel from France the numerous Italians, Belgians, and Germans who have been arrested in the act of exciting to violence.

The situation is no doubt grave, especially in regard to the exhibition; many of the workshops are closed, especially on the "Chemin de Fer de Ceinture," where the work is being carried on (as before mentioned) of substituting iron bridges for level crossings; but it is hoped that the firm attitude of the Government and the measures which are being taken to suppress disorder will bring the strike to an end before long, and that a *modus vivendi* between masters and men will be arrived at.

#### SOME FURTHER NOTES ON THE GLASGOW EXHIBITION.

THIS enterprise has just completed the third month of its appointed career, and of success, in the purely business sense of the term, there has hitherto been no lack. The sum of the attendance has been more than respectable, although the form in which the figures, through the medium of the local press, find their way from time to time to the public is hardly a straightforward or rational one. There is no excuse for ranking mere stall attendants as visitors; yet this is done, and not only so, but each entrance is made to count, and an attendant whose exceptional requirements take him in and out twelve times a day, swells the figures by twelve accordingly. There is not the same

\* We drew special attention in a recent article on the Glasgow Exhibition to the beautiful collection of medals by this artist in the sculpture-gallery there.

strength of exception to be taken to the mixing up of season ticket-holders and complimentary visitors with those who pay at the turnstiles (the only unerring criterion), but it would certainly be more candid to keep the two tables of figures entirely separate. Ticket-holders for the most part reside, or at least pursue their daily calling, within a short distance of the building; many of them make several visits daily, and in doing so contribute (innocently enough of course) to the swelling of these same somewhat deceptive attendance returns. Since the opening, on the 8th May, a certain degree of change has been going on amongst the general exhibitors, chiefly at the fancy of sundry exhibitors who were unable to open with a full show, or who had afterthoughts as to additions which appeared to them desirable. There has been a gradual process of accretion due to this influence, and there are cases, perhaps, in which it has gone too far. Pottery, earthenware, and glass goods have been added to very appreciably, and to the extent, possibly, of somewhat seriously upsetting the general balance or proportion of the Exhibition. These fragile goods are found, not only in set places, but everywhere, and are come upon incessantly by the examiner, at the imminent risk of suggesting iteration in an offensive degree. Many of the specimens are of undoubted excellence of manufacture and of some artistic merit, but many are only moderately endowed with good qualities of any kind. This department of the exhibition is decidedly overdone, and a ton or two of this class of goods might be carted away, not only with safety, but to the general advantage. On the other hand, there are sections which would bear some augmentation in the interests of this same balance and proportion. Models from the pattern-rooms of shipbuilding yards are present in a force which more than satiates; but although the Kelvin flows immediately under the northern façade of the building, and by special deepening operations, has been purposely made navigable to a practicable extent, there is nothing on its bosom save a mooring-buoy, a gondola, and two or three craft of the small launch order, only one of these—a new lifeboat deck seat—presenting features at all out of the common. More might have been made of it than this. The Kelvin itself, however, forms an instructive exhibit, although to one or two of the senses in some sort an objectionable one. Its presence here as an inclosed and thoroughly domesticated feature of an institution destined within a brief space to be visited by two or three millions of people, many of them of high initiative rank, may exert an after influence on a still unsolved problem—the prevention of the pollution of rivers. This inconsiderable stream rises in the heart of the Scottish midlands, at a point fully half-way across to the Fifth of Forth, thence flowing picturesquely through the valley to which it gives a name, on to confluence with the Clyde at Glasgow, about half a mile below the Exhibition. It has many polluting factories on its banks, and receives several tributaries subject to similar befouling influences, besides carrying away the sewage of a good many towns and villages—none of very large extent, however. Up to within a few months ago a considerable portion of the sewage of western Glasgow drained into it under the grounds of the park, just at the site of the Exhibition, and it still receives the household impurities of those suburbs of Glasgow which fringe the opposite or right bank of the river. Of late years, during the heats and droughts of summer, the Kelvin at this point has emitted a stench past all bearing, quite outdoing the larger-volumed and more fully-diluted Clyde in that respect; but it has been partially relieved by recent deepening and cleansing operations, and it will certainly prove less obnoxious this year. Yet, at this point, even now, it is not a considerable remove above the grade of a very badly outraged stream as regards the sewage and manufacturing refuse still permitted to drain into it. As nearly every visitor will cross and recross it, its condition is bound to attract attention; and, as a kind of impromptu exhibit, in this sense it may help towards the solution of a vexed question in sanitation.

Inside the Exhibition building itself, sanitary appliances,—engineering, architectural, and chemical,—are in most respectable force, and the dirty-faced and badly-odoured Kelvin outside forms a not unfitting complement



to these. The complaint and the tentative remedial prescriptions for it are alike on the spot. But the polluted Kelvin water is, after all, not the only exhibit of the kind here available. In Court 10, Messrs. Peter Spence & Sons, chemical manufacturers, Manchester, give a place within their case of general chemicals to a sample of Clyde water in full impurity as taken from Glasgow harbour. This unsavoury compound is contained in a large vessel of clear glass, and the examiner is thus enabled to arrive at an approximate estimate of the inherent degree of foulness present, which is unquestionably very great. These exhibitors also show, similarly bottled, Glasgow liquid sewage as sampled at one of the sewage outfalls on the line of the harbour. The river water is bad, black, and even lanky, but, of course, the sewage sample is worse in all respects, although Glasgow sewage at all times is largely diluted with the crystal Loch Katrine, which forms the city's water supply. These highly illustrative exhibits are two glass measures of equal size, containing liquids of comparative clearness, these representing similarly-drawn samples of Glasgow liquid sewage and Clyde harbour water after being cleansed by a chemical specific (aluminoferric), a patent of this firm. Into the merits, or the economical practicability, of the remedy, inquiry cannot here be made; but the illustrations are certainly most interesting, and, presumably, the exhibitors themselves are satisfied that their method is not only chemically sound but economically practicable. Mechanical appliances, also, for use in the sanitation of houses and other buildings, are forward in considerable force in this Exhibition. In Court 4, Messrs. R. Royle & Son, London and Glasgow, show a great variety of ventilating contrivances chiefly in metal, particularly an improved form of their self-acting air-pump ventilator, for extracting foul air from houses, factories, ships, &c., without the unwelcome concomitant of draughts; a fixed weather-proof downcast ventilator, for maintaining a current of sweet air through the 'tween decks of ships; a system of draughtless railway carriage ventilation, &c. This stall is well worthy of a careful survey by all interested in the problems of interior sanitation. Elsewhere, also, over the building, samples of air-propellers are pretty numerous, and some of them are to be seen at work. In the lighting of towns, factories, &c., long a monopoly of coal-gas, some novel aspirants (other than electrical) have of late been making way, both in England and Scotland. Illuminating gas, procured by a simple and inexpensive method, chiefly from mineral oils of Scotch production, and used in the ordinary way, and even in the ordinary gas burners, has been the most prominent of the coal-gas rivals, and one or two municipalities (very small ones only as yet) in Scotland have, during the past eighteen months, ventured to adopt the system, to the exclusion of the older lighting agent. Two of these oil-gas contrivances are on show at the Exhibition, one by the Paraffin Gas-Lighting Company, Glasgow, and another by Mansfield & Sons, of Manchester. The former take their gas from the partially-refined mineral oil of the Scotch shale-field; the others are not particular, and will, it seems, supply themselves with gas from any cheap oils or fats readily procurable. A greater adaptability to circumstances has, it would appear, been developed since the new lighting mode was first announced. Oil-gas flame, as shown here, certainly possesses some points of advantage over that of coal-gas. The lighting power is as ample, while the texture of the flame is whiter of tint, softer and mellow, than that under ordinary circumstances obtainable from the municipal coal-gas supply. Mansfield's oil-gas, besides showing as an illuminant, figures also as a prime mover, and is here found at work driving one of Crossley's gas-engines, ordinary type. It seems assured that the new system requires only the simplest of plant, at a correspondingly moderate outlay, and is readily and safely handled by any craftsman of ordinary intelligence; and this being so, it may with advantage be applied to the lighting of mansions, villages, mills, and factories, out of the reach of a municipal supply,—or even to ships. In point of fact, oil-gas is now being used all over the country by consumers thus exceptionally placed; but, although it claims to be the cheapest in the world, even for towns, more than a doubt on the point exists. At least, one small gas corporation in Scotland, which over a year

ago adopted the oil-gas system in high hope, has already felt compelled to revert to the old agent; this, however, cannot be held as conclusive, for failure in the particular case in point may have been due to lack of intelligence, or of some other essential, in applying the new method. Messrs. Braby & Co., London, also show their "Portable Sunlight" adaptation, which is another new departure in the use of oil as an illuminant under novel conditions. The portable sunlight machine is surely the largest of the race of lamps, and, as its name implies, it may be moved from place to place—carried or wheeled—without disturbing its bushy torch-like flame, which is obtainable, in the heavier sizes, at a strength up to 3,000 candle-power. This "lamp," or whatever it may be called, has already made rapid progress, having been found of special value at large open-air works, and other undertakings prosecuted at night as well as during the day, where the best possible imitation of daylight is required, and that at a reasonable cost. It is not at all dainty as to its food. Oils of little value for other purposes—refuse or residual oils, so to speak—may be employed with satisfactory results, and it is asserted that the largest of the various makes will do its duty well on less than three gallons an hour; the cost per gallon of the stuff used barely rising to the value of the smallest silver coin.

Archæologists would never dream of anything very specially interesting to themselves in the exhibit of the Tharsis Sulphur and Copper Company, from merely scanning the modest entry appertaining to it in the catalogue. This entry is confined to barely two lines, which indicate, simply, cupreous pyrites with specimens of the metals obtained therefrom, also a painting and model of the Tharsis mines. But the same mines were worked by the Phœnicians, Carthaginians, and Romans of old, and it is greatly to the credit of the directing managers to find that they have devoted quite a large portion of the stand space at their disposal to the ancient relics come upon from time to time since this particular mineral region became the property of an English and Scotch syndicate in 1866. These mines are situated about thirty miles inland from the Spanish shipping port of Huelva, and are believed to have been first worked ten or eleven centuries before the commencement of the Christian era. They have been drawn upon by various races almost continuously ever since, and the Roman galleries, which were of large extent, are still there for examination. The relics, as here grouped, consist of bits of ancient slag, both Roman and Phœnician; Roman grave-slabs, brick and tile specimens, cinerary urns, lamps, coins, and various articles in bronze, Roman clay mugs, tear bottles, &c. There is an oil painting of the north lode open-cast of the mines, which, although certainly of small merit as a work of art, answers well enough the illustrative purpose in view: and there is also what the exhibitors call a "model" of Tharsis. The latter is not really a model of Tharsis, but an orographic map of about six square miles of the company's territory there, roughly executed, but serviceable. The exhibits from the modern workings of these mines (Tharsis and Calañas) include samples of purple ore, burnt ore, cupreous schist, &c.,—all highly interesting to "the Copper Ring;" but these are clearly outdone in general interest by the ancient relics, although the latter were at first thought of as accessories only. In the same section, which is devoted to mining and minerals chiefly, there are two or three models illustrating the practice and outcome of mining operations at home. One is a representation, on a small scale, of a pit bottom, Legbrannock, Lanarkshire; but the leading example is that of a working face, full size, in the Ell Seam at Earnock Colliery, built up in a highly realistic fashion, with the effigy of a miner, pick uplifted, in the act of attacking the stratum in front of him. The representation is effective, but it might have been more so if in the "make-up" of the stuffed miner there had been more of adherence to fact and less of mere transpontine staginess. This rather "masher"-like collier resembles the real article as little as the ordinary stage mariner resembles the *bond fida* Jack aboard; but realism is partly vindicated in the huge masses of coal here built up into the semblance of a working place, for these have been carefully cut out of the seam itself. In the Artisan Section (Court 19) there are pit working models on a small scale, also a Fifth

of Forth coal-lading staithe, a Forth Bridge, and numberless other models,—for the most part amateurish, but worthy of regard when the necessary allowances are made and kept in view.

Of breakwater models there is a surprisingly scanty show. That of the sea-wall now being erected in Wick Bay,—the watery grave of so much engineering effort and outlay,—by Mr. James Barron, C.E., of Wick harbour works, is the chief, almost the only, specimen. It is placed in Court 4. Wick Bay is, perhaps, the most exposed spot within the circuit of the British coastline ever seriously contemplated as the site of a great breakwater. It is safe from two-thirds of the winds that blow; but a gale with anything of easterly in it, even a moderate gale, speaks of danger at once, and much life and a heavy tonnage of shipcraft, from first to last, have been lost there by the too sudden tumbling in of the excited rollers from the open. A breakwater, designed to be the backbone of a harbour of refuge, which it had been decided to construct there on a semi-national basis, was begun more than a quarter of a century ago, but after an enormous outlay, storm after storm brought utter ruin upon the undertaking, spreading the massive work along the deep bottom of the treacherous inlet, and leaving it more dangerous than before. The attempt was finally abandoned. The Wick Harbour Trustees are now engaged on some mitigation of the evil character of their bay, this time on a more modest scale, of course, and the design and composition of the principal feature of the works, the sea barrier, are here shown. The work is to be of Portland-cement concrete throughout, in top blocks of over 450 tons' weight, the base being protected from scour by sheet piling and a concrete apron, and the wall, when finished, will form one monolithic mass. Mr. Barron's model is on a scale of  $\frac{1}{4}$  in. to the foot, and it serves its purpose well. Adjoining the breakwater are shown, by Messrs. W. C. Bergins & Co., Glasgow, numerous models of ready-fitting structures to be shipped to half-settled regions, and there put in position by unskilled labour. These include a roofed pier upborne on coarsely-pitched screw-piles for easy removal; a screw-pile pier, store, and dwelling-house for the Brass River; gable ends of Rio Scunno Custom-house and Olenbo fortified stores; Borneo spice store; Rio Grande cradle or slip dock; Niger trading store, or granary, with skeleton roof; pier-head of a Calabar palm-oil jetty, &c. These models are all very rough, as, no doubt, are also the erections they represent; but as illustrations they are acceptable, and not a little interesting. Messrs. Head, Wrightson, & Co., of Teesdale Ironworks, Stockton, in Court 5, show a model, in type-metal, of one span of the eight-span "Empress" girder-bridge, by which the Indus Valley Railway is carried over the Satej. The bridge was built by them for the Indian Government, from the design of Sir A. M. Rendel. The same exhibitors also show one span of the Ibiçuy Bridge, South Brazil, on the same liberal scale of  $\frac{1}{4}$ th full size; a hydraulic centre crane, with automatic compensating arrangement to meet fluctuations of load weight; and an interesting illustration, in model, of a hydraulic drop, representing a system for lowering wagons in blast-furnace plants, wherein the load is controlled by the hydraulic cylinder, and the cage is made to return by the action of the balance weights. These models are all in minute and well-finished detail, and the spacious stand claims and receives a large share of attention from experts, besides being closely looked at by the ordinary visitor.

In the transverse avenue, Messrs. W. H. Bailey & Co., Manchester, exhibit, in action, their patent turret clock on the lathe-bed principle, along with a large selection of recorders, tell-tales, gauges, testers, &c., covering about the entire field of inventions in regard to house, warehouse, and public-works mechanical registering and watching. Many of these are of striking ingenuity. Amongst the few exhibits of polished granite in the building, mention may be made of that by Messrs. D. H. Newall & Co., of Dalbeattie, Peterhead, and Rhode Island. Their specimen of American granite (Westerly) is much looked at, as partly a novelty; and they also show two pedestals in grey Dalbeattie, and two tazans in red Peterhead,—all remarkably fine stones. A very effective exhibit is that of Messrs. D. & J. McKenzie, Glasgow, consisting of stucco and clay models, caps, cornices, friezes, enrichments, &c., in Court 4; and again in the transverse avenue, against the



wall, there is a display of patent golden lustre silk paper-hangings (Messrs. Cooke & Co.'s, Grove Works, Leeds) which claims the notice of all interested in house-fitting operations. One of the most brilliant of the sections, so far at least as mere colour is concerned, is that devoted to chemicals, paints, colours, and dyestuffs, for the most part congregated in Courts 8, 9, and 10, adjoining the dome and main avenue. Conspicuous items in this section are three enormous crystals of alum, with an aggregate weight of about forty tons.

Out-of-door features not already mentioned are chiefly the switchback railway, which has been largely patronised; a military bridge across the Kelvin, used as a shorter route to the switchback; and a captive balloon with requisite terrestrial appointments. There is also a rink of imitation ice, on which the Scotch winter pastime of "curling" may be simulated by enthusiasts, if the enthusiasm be very strong indeed. The curling-stones are shaped and fashioned like the genuine article, only they do not slide along the rink, but roll over it on little wheels, something after the manner of the roller skate. On the whole, it is scarcely a diversion which commends itself in the hot temperature of midsummer, and the enterprising lessee is not overwhelmed with business. The Bishop's Castle and the interesting historical collection which it covers continue to attract streams of visitors, and the castle and its contents to many minds form by far the most powerful of the allurements of the Glasgow Exhibition,—but there are serious drawbacks. The ventilation is faulty, and when the crowd grows to a certain mark it is impossible to examine anything with any approach to comfort. Many visitors after crushing in are forthwith constrained simply to crush out again, trusting to a more convenient season. The plan of the old castle was not adapted for crowds at any time, and it is less so now, when the various chambers are filled with rows of stands. Stuart and other Scottish relics are here in a wealth and profusion never before achieved, and destined perhaps never to be repeated; but, over and above defective ventilation and cramped space, there is the added drawback of a poor light, and at the best these archaeological treasures can be but imperfectly viewed. It is to be regretted that this fine collection had not been housed more appropriately elsewhere. The model of the grim old fortress possessed interest enough in itself to stand alone.

#### THE MINERAL AND INDUSTRIAL RESOURCES OF IRELAND:

##### THE IRISH RAILWAYS.

THE Institution of Mechanical Engineers is holding its summer meeting in Dublin this week. We extract the following from the address given by the President, Mr. Edward H. Carbutt, on Tuesday:

The manufacturing prosperity of England is largely due to its mineral wealth. Unfortunately Ireland is not rich in minerals. The following figures of the mineral production, mainly in 1886, show how small it is, only 8,164 persons being employed in mining:—

|                                    | Tons.   | Value.  |
|------------------------------------|---------|---------|
| Coal raised in 1877 .....          | 140,000 | —       |
| " " 1886 .....                     | 105,000 | £42,225 |
| Iron ore in 1886 .....             | 101,000 | 15,241  |
| Salt in 1886 .....                 | 31,000  | 14,151  |
| Lead .....                         | 241     | 1,428   |
| Copper ore .....                   | 23      | 74,824  |
| Total produce in 1886 from mines   | —       | 300,336 |
| Slates, quarries, gravel, &c. .... | —       | —       |

So you see only about 100,000 tons of coal are got per annum, and that not of the first quality. The Public Works Commissioners point out that coal is worked in Kilkenny within ten to twenty miles of three railways, and yet no branch line has been made to the mines; perhaps if railways were extended the mines might be more largely worked. The coal-mining industry is not a growing one, as it will be noticed that since 1877 there has been a considerable decline. Mr. C. De Rance, of the Geological Survey Office, informs me that the 4-ft. seam in the Kilkenny coalfield is almost worked out; this is the best coal, and can be sold for 20s. per ton. Dr. Edward Hull, in his book on the coalfields of Great Britain, states that the quantity of coal raised in Ireland is comparatively small, and much below what it ought to be if all the coalfields were properly developed. He has taken every opportunity to

encourage coal-mining in Ireland. The districts of Tyrone and Antrim, he says, have considerable resources in mineral fuel; and he estimates the total available coal in Ireland at 182,280,000 tons. The seams are very thin, and it becomes a question how soon it will pay to work them. Only about 100,000 tons of iron ore are got every year, some of which is used for gas-purifying; the aluminous iron ore fetches 3s. per ton; the best 4s. per ton.

Concerning Irish railways, we have many sources of information. A Commission under the Duke of Devonshire reported on railways, including Irish railways, on May 7, 1867, and reported against State purchase, and advised that amalgamation should be facilitated. Then a Committee, appointed by the Chief Secretary for Ireland, reported on April 30, 1868, that if the Irish railways were all under one management 82,000*l.* a year would be saved. And this year we have the report of the Public Works Commission, under the chairmanship of Sir James Allport. Irish railways have been constructed partly by public money and only partly by private enterprise, 4,101,000*l.* Having been advanced to them by the Government, of which 2,921,000*l.* has been repaid. In addition to the one million still to be paid, there is 115,000*l.* for overdue interest. Comparing the railways at the date of our former visit\* with the present, we find that in 1865 there were seventeen railway companies with 1,838 miles of line, while in 1886 there were twenty companies with 2,615 miles. These figures, of course, do not include tram and light railways. The average increase has been thirty-six miles a year, and the total increase in train mileage and in gross earnings has been from 30 to 40 per cent. The net return on the capital in 1886 was slightly over 3½ per cent., or about the same as that earned in 1865. It would not be fair to compare the miles of railway in Ireland with the miles in England; but if compared with those in Scotland, there is one mile of line to every twelve square miles area and 1,800 inhabitants in Ireland, and one mile to every ten square miles area and 1,200 inhabitants in Scotland. Remembering that Ireland is largely agricultural, she may be considered not badly supplied with railways; for, in addition to the above total of railway lines, there are the narrow-gauge and tram lines made under the Tramways Act of 1883, namely, 162 miles open or under construction, costing 676,000*l.*, and 141 miles sanctioned but not commenced, costing 581,000*l.* Unfortunately, the break of gauge to 3 ft. has proved a disadvantage in these light railways.

It is satisfactory to note that Sir James Allport's Commission report that the condition of Irish railways has improved in the last twenty years in respect to finance, permanent way, and rolling stock. Their credit has improved, although it is not so high as that of English railways. The one thing in which no improvement has taken place is the rates and fares, and in some cases these have increased. As Lord Ebury pointed out in the House of Lords, the third-class traffic tripled in England in fifteen years, while it hardly made any progress in Ireland. Reduction in fares and greater facilities for third-class traffic would prove an immense boon to the poor Irish tenant-farmers. The management expenses are so great in Ireland that the fares cannot well be reduced. There are twenty boards of management, with over 313 directors, for the Irish railways, with a total annual receipt of 3,000,000*l.*; while in England the Great Western Railway, with 300 more miles of line, is managed by nineteen directors, and has a total annual receipt of 5,000,000*l.* Not only are there so many directors in Ireland, but there is also separate management in every department on every separate railway; and what makes economy of working still more difficult is that many of the lines have separate stations in the same town, namely, Dublin five passenger termini, Belfast three, Londonderry three, Waterford three, Cork five. In the locomotive department there must be considerable loss, in consequence of not getting a full mileage out of each engine on short lines. The result is that the working expenses in Ireland amount to 55 per cent. of the receipts, in England to 53, and in Scotland to 50 per cent. If the Irish expenses could be reduced to the same proportion as the Scotch, there would result a saving of 140,000*l.* per annum.

In their recommendations Sir James Allport's Commission follow very much the recommenda-

tion of the Duke of Devonshire's Commission, that is, they report against State purchase, and in favour of amalgamation. They recommend the appointment of an Irish Commission with power to protect the public against abuse of the monopoly which would thus be left in private hands. Such a Commission should be located in Ireland, and should consist of four special members, who should be leading men of business representing different districts, and one Government representative. They should have power to arrange and approve amalgamations between existing companies, and also to obtain proper safeguards for the public. The Government should also have the power to call upon the amalgamated companies to make such extensions as may be required.

"Speaking for myself, I trust that the Government will see their way to leave the railways in private hands. An amalgamated company, I believe, would save very much more than the 40,000*l.* a year, which is the saving from amalgamation as estimated by the Commission; and increased facilities and cheaper fares would be an immense boon to a comparatively poor country. One splendid example of what private enterprise has done in Ireland is furnished by Guinness's brewery; and the public show their confidence by buying the shares at 34 times the price of issue. I doubt whether Irish railways will increase much more. It must be remembered that Ireland is a small island, and that the cost of water-carriage is so very much less than of land carriage; consequently, where speed is not an object, it is cheaper to carry goods a longer distance by sea than by a cross-country railway. This does not apply to the transport of fish, &c., where speed is of importance.

I am indebted to one of our members, Mr. William Parker, Chief Engineer Surveyor of Lloyd's Register of Shipping, for the following particulars of cost of carriage by sea. Taking a modern cargo-carrying vessel, 275 ft. length, 37 ft. beam, 19 ft. depth, 2,127 gross tonnage, and 780 h.p., the paying load carried will be 3,160 tons. Such a vessel, driven at 3½ knots or 10.93 miles per hour, consumes 13 tons of coal per day. Taking the coal to cost 17 per ton, this shows that 100 tons of paying load can be carried one mile for 3.52 lb. of coal, costing 0.377*d.*, or less than a halfpenny for coal consumption; or for 7-8ths of a penny, including cost of working the ship and insurance. I cannot give what percentage ought to be added for dock and harbour dues and for management, and what for repairs and depreciation; but the shipowner has no land, stations, rails, &c., to pay for and maintain. The above figures apply to a full cargo, in the newest build of ship with triple-expansion engines, over a voyage from Antwerp to Bombay and back, which necessitated an expenditure of 1,225*l.* for Suez Canal charges.

To compare this with the cost of railway haulage, Mr. Tomkinson, one of our Vice-Presidents, has given me the following figures, taking full train-loads at a slow speed over a long distance. On a good road, with gradients about 1 in 350 varying, 40 lb. of fair average coal per train-mile will raise steam to work at from twelve to fifteen miles an hour a mineral train of 560 tons gross load, made up as follows:—

|                                       |          |
|---------------------------------------|----------|
| Engine .....                          | 45 tons. |
| Tender .....                          | 25 "     |
| 30 Wagons, each 16 tons gross load .. | 480 "    |
| Brake Van .....                       | 10 "     |

Gross load of train ..... 560 tons.

The paying load will be 300 tons, or 53.57 per cent. of the gross load. The consumption will therefore be 13 lb. of coal per mile per 100 tons of paying load. The coal used on the railway, however, will cost only 8s. per ton, against 20s. for that used at sea. Hence the cost of railway haulage per 100 tons of paying load will be 0.57*d.* per mile for coal.

The charges on railways are very heavy. The working cost may be assumed all round at about 50 per cent. of the receipts, and may be closely apportioned as follows:—

|                          | Percentage of Receipts. | Pence per Train-mile. |
|--------------------------|-------------------------|-----------------------|
| General charges .....    | 3                       | 1.5                   |
| Way and Works .....      | 16                      | 5                     |
| Locomotive department .. | 13                      | 9                     |
| Carriages and Wagons ..  | 6                       | 3                     |
| Traffic expenses .....   | 15                      | 10                    |
| Law and Parliamentary .. | 1                       | 0.5                   |
| Compensation .....       | 1                       | 3.5                   |
| Rates and taxes .....    | 3                       | —                     |
| Duty .....               | 0.5                     | —                     |

Total Working Cost... 50 per cent. 32 pence.

\* In 1865.



Hence, with trains such as that above mentioned the total working cost for hauling 100 tons of paying load would amount to about 11d. per mile. But railways seldom get full train-loads except when carrying coal. The increased speed necessary to work a mixed passenger and goods traffic also rapidly increases the expense of haulage.

Both marine and railway haulage are cheaper than horse or traction-engine haulage. Horse haulage, I suppose, would cost from 8d. to 9d. per ton per mile; and Messrs. John Fowler & Co., of Leeds, inform me that traction-engine haulage would average about 2½d. to 3d. per ton per mile.

It would be impossible here to give details of every industry, but as a last example the deep-sea fishery may be referred to. The estimated value of the fish taken in Irish waters amounted in 1886 to 640,000*l.*, while in Scotland it amounted to 1,397,000*l.*, and in England to upwards of 4,000,000*l.* Unfortunately, in Ireland it is a declining industry, for whereas in 1846 nearly 20,000 vessels were employed, manned by 115,000 men, now only 5,683 vessels, manned by 21,500 men, are so engaged; and, what is worse, only some 4,000 of these men are wholly employed in fishing. The Public Works Commission report that the appliances used in Ireland for deep-sea fishing are very deficient; that in the whole of Ireland there are only 600 boats above 30 ft. keel; and that many of these vessels are not decked, so that they cannot keep at sea in rough weather; also that there are no curing establishments, and that none of the nets are made in Ireland. They further state that deep-sea fishing as a national Irish industry can be profitably carried on only by the construction of harbours having sufficient depth of water for fishing craft at low tide; and they recommend the Government to spend 400,000*l.* on the construction of such low-water harbours.\*

The Government have introduced three Bills for the drainage of land within the catchment areas of the Rivers Lann, Barrow, and Shannon; and they propose to make a grant of some 300,000*l.* out of the public purse for this engineering work. The object is to prevent the flooding of the land.†

#### THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION.

##### FURTHER EVIDENCE.

MR. GEORGE BROWN, sworn and examined, deposed that he was the owner of two houses in Lisson-street, in respect of one of which he received a notice from the District Surveyor as to the dangerous condition of the party wall. When he went to see it he found Mr. Brick there, and told him to get the work done and he would pay half the cost. Witness was a member of the Board. Some time afterwards he spoke to Mr. Vulliamy about the matter, and asked him what was to be done. Mr. Vulliamy said, "Well, you must obey the order." Witness said he was prepared to do so, and Mr. Vulliamy then referred him to Mr. Thomas of the Dangerous Structures Department. He denied that he had told Mr. Brick that he would get somebody from the Board to overrule or override the District Surveyor's decision. He did not meet Mr. Feebles (the District Surveyor) on the ground. Cross-examined by Mr. Studd, on behalf of the Inquiry Committee, witness said he had never made any payment to Mr. Thomas or any other official of the Board over this matter.

Sir Joseph Bazalgette, sworn and examined, said he was Chief Engineer to the Board, and had occupied that position for thirty-nine years, at least, in the service of the Board and its predecessors. He had been Chief Engineer of the Board from its commencement, and the whole of the engineering work and the engineering staff had been under his control. Having given some particulars as to the number and duties of the assistant engineers, the witness handed in a written statement prepared by him for Lord Herschell's information, describing the procedure in the carrying out of new works, from their proposal until their completion. Asked as to the method of dealing with tenders for works, the witness said that the tenders were deposited in a box on the Thursday afternoon before a Board meeting. They were either opened at the Board meeting, or they were opened by the

Clerk before the Board meeting and handed to the Chairman, who announced them at the public Board. The lowest tender was not always accepted. Usually, inquiries were made as to the competence of the contractors, and if the results of those inquiries were not satisfactory, then the lowest tender was not accepted.

Witness did not advise at all as to whether the tenders should be accepted or not. He merely stated whether the contractor had done work for the Board, and if so, whether he had done it well or otherwise; but the inquiry as to his condition was conducted by the Solicitors' Department. After the contract was entered into, the supervision of the work was looked after by one of the assistant engineers, by the district clerk of works, and by special clerks of works. The Board had a regular form for its contracts. A sum of money was usually provided for "extras"—something like 10 per cent. upon the amount of the contract; and if, when the extras were measured, they did not reach that amount, the rest would be returned. It was an assumed sum to cover the "extras" and make the contract amount nearer to what the contract was likely to run to. Before any "extras" were paid, witness had to give his certificate. The assistant engineer measured up the work monthly, and received returns of "extras," and he allowed those which were clear, while those which were not clearly "extras" had to stand over for future decision. The contracts also provided for certificates from time to time for payment for the work done, which were approximate estimates of its value. The assistant engineer gave those certificates, but he (witness) was responsible for them. It was witness's duty, and that of all officers employed on the works, to see that the materials were of the specified quality. The contractors were paid monthly. When the work was completed the contractor sent in an account. The assistant engineer went through that account with the clerk of works, and made his corrections upon them. There were sometimes questions upon which they could not agree—for instance, as to what was included in the specification, and various other points of that kind, which were referred to witness. Witness then had the assistant engineer and the clerks of works, with the contract drawings and specification before him, and the contractor and his agents, and witness heard what each had to say, and determined the points in dispute. After that was done the account was sent to the Accountant, certified as to quantities, and the Accountant compared the prices with those in the schedule of extra works which was attached to the contract, and looked to the costs, and so forth, and eventually signed it as correct. Then he (witness), signed the certificate for the Board, and the contractor was entitled to his money. Since the time that the Board had been in existence, a great number of large engineering works had been carried out, to the amount of over 8,000,000*l.* The principal works of recent years had been the Embankments and the bridges. The larger contracts included the following:—In 1860, there was a contract with W. Webster for 310,000*l.* for the Southern Outfall Sewer, and one for 669,000*l.* with Mr. Furness for the Northern Outfall Sewer. In 1861 there was a contract with Messrs. Brassey, Ogilvie, & Hattison for 358,000*l.* for the Northern Middle Level Sewer, and in 1862 one with Webster for £395,000 for Crossness Pumping Station. Then in 1863 there was a contract with Webster for 237,000*l.* for the Southern Low Level Sewer; one for 172,000*l.* with Furness for the Northern Outfall Reservoirs, and one with the same contractor of 520,000*l.* for the Thames Embankment (North). In 1864, there was a contract for 247,000*l.* for the Thames Embankment (North) with Ritson, and one for 253,000*l.* with Webster for the Northern Low Level Sewer. Then in the next year, 1865, there was a contract for 293,000*l.* with Webster for the Thames Embankment (South), and in 1866 one with Webster for 120,000*l.* for the Isle of Dogs Branch Sewers. Then in 1867 there was a contract for 127,000*l.* with Webster for the Victoria Embankment wall; in 1871 another with Webster for 132,000*l.* for the Chelsea Embankment wall; and in 1872 two others, 130,000*l.* and 58,000*l.* respectively, for the Western Pumping Station buildings and engines, also with Webster. Then, in 1882 there were two contracts with Mr. Waddell, viz., Putney Bridge, 222,000*l.*, and Sewers, 140,000*l.* Then in 1886 there was one with Messrs. Williams, Son, & Wallington for the new Battersea Bridge, 143,000*l.*; and in 1887

one with Messrs. John Mowlem & Co. for the Northern Outfall Precipitation Works at Barking, amounting to 406,000*l.* Lord Herschell said he observed that Mr. W. Webster had carried out a very large number of these works; were his always the lowest tenders? Witness said he thought so.

Mr. George Brick, recalled, said he adhered in every point to the evidence he had already given as to what passed when Mr. Brown and Mr. Thomas visited the dangerous structure in Lisson-street.

Mr. Edmund James Sherwood, architect and surveyor, corroborated the last witness, and said that he distinctly heard Mr. Thomas say that he was surprised that the District Surveyor should condemn the party-wall of Mr. Brown's house.

Mr. George James Thomas, of the Dangerous Structures Department of the Architect's Office, recalled, said that to the best of his knowledge he had never seen Mr. Sherwood on the premises in Lisson-street at all.

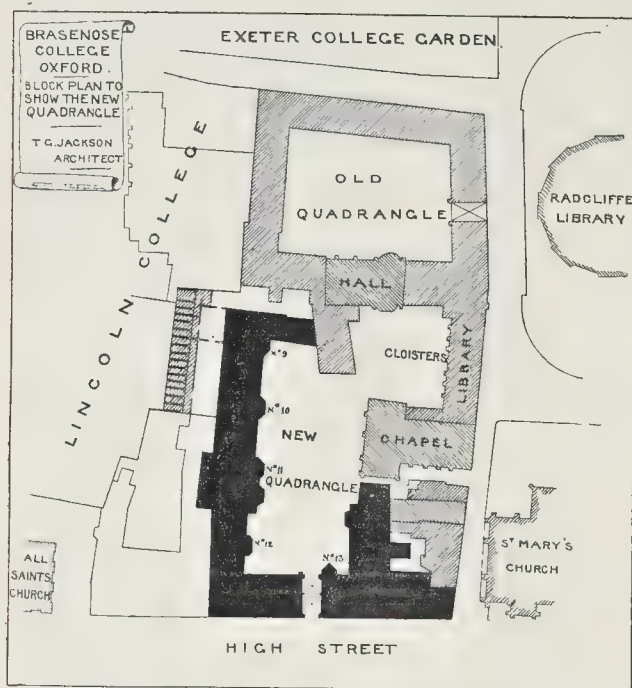
Sir Joseph Bazalgette, recalled, said that Mr. Furness was the contractor for that part of the Embankment which lies between Westminster and Waterloo Bridges. At the time that Mr. Furness's tender (520,000*l.*) was accepted for that work there was a lower tender by Mr. Ridley for the same work, amounting to 495,000*l.* Inquiries as to Mr. Ridley's financial position and character did not satisfy the Board, so his tender was not accepted. Messrs. Baker & Sons' was the next lowest tender. They were well-known people, and would have been very satisfactory contractors, and the Board accepted them, but in the course of negotiation with them they withdrew from the agreements. Then Mr. Moxon was the next lowest tenderer, but his financial condition was known to be unsatisfactory, and he failed shortly afterwards. When Messrs. Bakers' offer fell through he (witness) recommended the Board to re-advertise the contract, but after consideration they determined not to do so. Asked whether he had any financial arrangement with Mr. Furness, the witness said he had not. Sir John Rennie, he explained, had obtained a concession of a contract in Odessa. He (Rennie) had to carry out the contract within a given time. He had been in treaty with other people and had failed to do so, and he came to witness stating that he was prepared to part with the contract upon condition of his having 5 per cent. for the concession, and he said to witness: "If you will find me a contractor to carry this out, I will divide my interest with you," so that witness was dealing with Sir John Rennie with reference to a contract in another country, having no reference whatever to anything connected with witness's official position. Witness introduced Sir John Rennie to Mr. Furness, and Mr. Furness agreed to take the contract. An agreement was drawn afterwards that Mr. Furness should pay to Sir John Rennie one half of the commission on the concession and one half to witness; but witness's agreement was not with Mr. Furness, who would have paid the whole sum to Sir John Rennie. The date of that agreement was, he thought, 1860. Asked whether it was pending, or whether it had been completed at the time of the tender of Mr. Furness, witness said that early in 1862 Sir John Rennie made the proposal to him, and Mr. Furness's contract was in October, 1863. Witness had never received one penny from Mr. Furness under that arrangement, for when he (witness) found that it was thought that his having that connexion with Mr. Furness's work might interfere with his official duties, he at once relinquished his claim, and never received anything. The matter came to be considered through some litigation between Sir John Rennie and Sir John Rennie, and to which witness was made a party. That was subsequent to Furness's contract. It was some one at the Board who suggested that witness's connexion with Furness might interfere with his duties. The fact that such an arrangement had been made was made public during the trial of the case in question, and witness was asked about it by the Board. As he found that there was a feeling that the affair might compromise his position, he relinquished all connexion with the matter. He forgot what was the amount he thus relinquished, but it was a large sum. Asked whether, in the carrying-out of the contract by Mr. Furness, he permitted any variations from what was required by the specification, witness said he could not speak from memory. He certainly permitted no variations as to the mode of filling-in the reclaimed ground. The ground was to have been filled in

\* See last volume of the *Builder*, pp. 185, 315.

† See *Builder* for last week, p. 67.

‡ For summary of previous evidence see the *Builder*, pp. 8, 44, 96, ante.





Block Plan of Brasenose College, showing Extent of New Buildings.

by dredgings from the river, but the Conservators of the Thames did not carry on the dredging as rapidly as the Board's work required, and, therefore, filling-in material had to be taken from other places. Asked whether he had had any financial transaction of any kind with any of the other contractors for works carried out by the Board, witness replied in the negative. We break off here for the present.

### Illustrations.

#### NEW BUILDINGS, BRASENOSE COLLEGE, OXFORD.

THE new quadrangle which is being built from Mr. Jackson's designs at Brasenose College, Oxford, has been formed by the removal of several cottages in Amsterdam-court,—once the site of an ancient University hall,—and some buildings of timber and plaster of no antiquity, which contained rooms for undergraduates. The wing, which forms the west side of the new quadrangle, was begun in 1882, and has just been completed, together with the return wing on the north. These buildings contain twenty-two sets of rooms for undergraduates, one large set for a Fellow, and two large lecture-rooms, as well as a reading-room for undergraduates, and some additional offices connected with the College kitchen.

The quadrangle is now being completed by a south wing with a frontage to High-street, extending westward from the corner next St. Mary's Church, with gateway and entrance-tower in the middle.

A new house for the Principal occupies the eastern part of the front and the return wing behind it. The interior will be handsomely finished with oak-pannelled rooms and an oak staircase. The remainder of the building facing High-street, including the tower, will contain rooms for undergraduates and Fellows, and a munition-room with fireproof floor in the upper story of the tower.

The general contractors for the first part of the new quadrangle were Messrs. Symm & Co., of Oxford, and for the succeeding part Mr. Wilcock, of Wolverhampton.

The contractor for the present work, including the front and gateway-tower, is Mr. Dobson, of Colechester. Mr. Mockford is the clerk of works.

#### WENLOCK PRIORY, SHROPSHIRE.

THE two pages of details, &c., of Wenlock Priory, Shropshire, are reproduced, by permission, from Mr. T. Locke Worthington's recently-published book entitled "Remnants of Old English Architecture," of which a review appears in another column of our paper this week.

#### LODGE AND COTTAGES AT GREAT WARLEY, ESSEX.

THESE have been erected for Mr. E. Heseltine, of the Goldings, near Brentwood.

The material is concrete, of gravel dug on the spot, and selenitic lime, filled in between Burntised Dancie timber. The construction of the timbers of the Lodge is on a new system devised by the architect.

The lower stories are of brick, except in the case of the Lodge, where it is of concrete faced with neat pebble dash.

All the tile roofs are laid in concrete plaster on the architect's system.

The builder of the double and four cottages was Mr. I. R. Norfolk, of Warley; and of the lodge, Mr. J. Cross, of Hutton, near Brentwood. The ornamental plaster was executed by Mr. Walter Smith. The architect was Mr. Ralph Nevill.

#### OLD COTTAGE ARCHITECTURE.—III.

THE normal plan of an old cottage was a simple parallelogram, and in a future number I hope to give illustrations of some that are still unaltered. The lean-to's and return gables are generally the result of additions, and therefore to a certain extent of accident. The picturesque result from the skilful arrangement and grouping of roofs of various sorts is, perhaps, the chief lesson to be learnt from old examples, as modern plans can hardly be made to agree with the old.

I have given two views of the same cottage at Thorncombe-street, because of the peculiarly happy arrangement of the lean-to roofs. Notice should be taken of the projected weather-tiling in the upper example. Under this the tools of the tenant were hung. Lean-to's generally have the sides of oak board, which, grey with age, and covered with lichen, is of a very beautiful colour. Unfortunately, though landowners have learnt to appreciate the beauty

of old tiling, this old boarding is generally condemned and sacrificed to the demon of tidiness.

The house at Nursecombe is of good character. There are some carefully-wrought pendants to the front barge-boards that I will hereafter illustrate. My sketches were taken some years ago, and the old barge-boards in the front have been replaced with very bad imitations. The central pair at the back are, however, original, and of a pattern common in the neighbourhood. The wing, with the outside chimney, I take to have been added at a somewhat later date to the original house. Some improvements were made to the windows when the house was recently repaired.

The cottage at Womersley, with the recessed part, shows a favourite form in the old houses. There was probably another projecting wing on the near side of the recess. The view above Tangley Manor is of an inn, for which purpose the house was probably built.

Great Tangley Manor is the most important example of a timber house in this part of the county. A corbel in front bears the date 1582, and the whole of the front is doubtless of this date. The detail of the windows is very good, and all the corbels are richly carved.

The ground has accumulated round the building so that it is sunk about a foot. Behind the front is the old fourteenth-century Hall, with its screen and a very fine and massive tie-beam and truss still remaining. The back roof shown in the sketch is that of this Hall. This is a good instance of a custom I mentioned in a previous paper, of cutting the old Halls into two heights by a floor and making the top parts into bed-rooms. The massive character of the truss saved it in this case from being cut away.

In Vol. IV. of the Surrey Archaeological Transactions is a paper by the late Mr. Charles Baily, F.S.A., which gives an account of this roof, and the best general account of houses of this class with which I am acquainted.

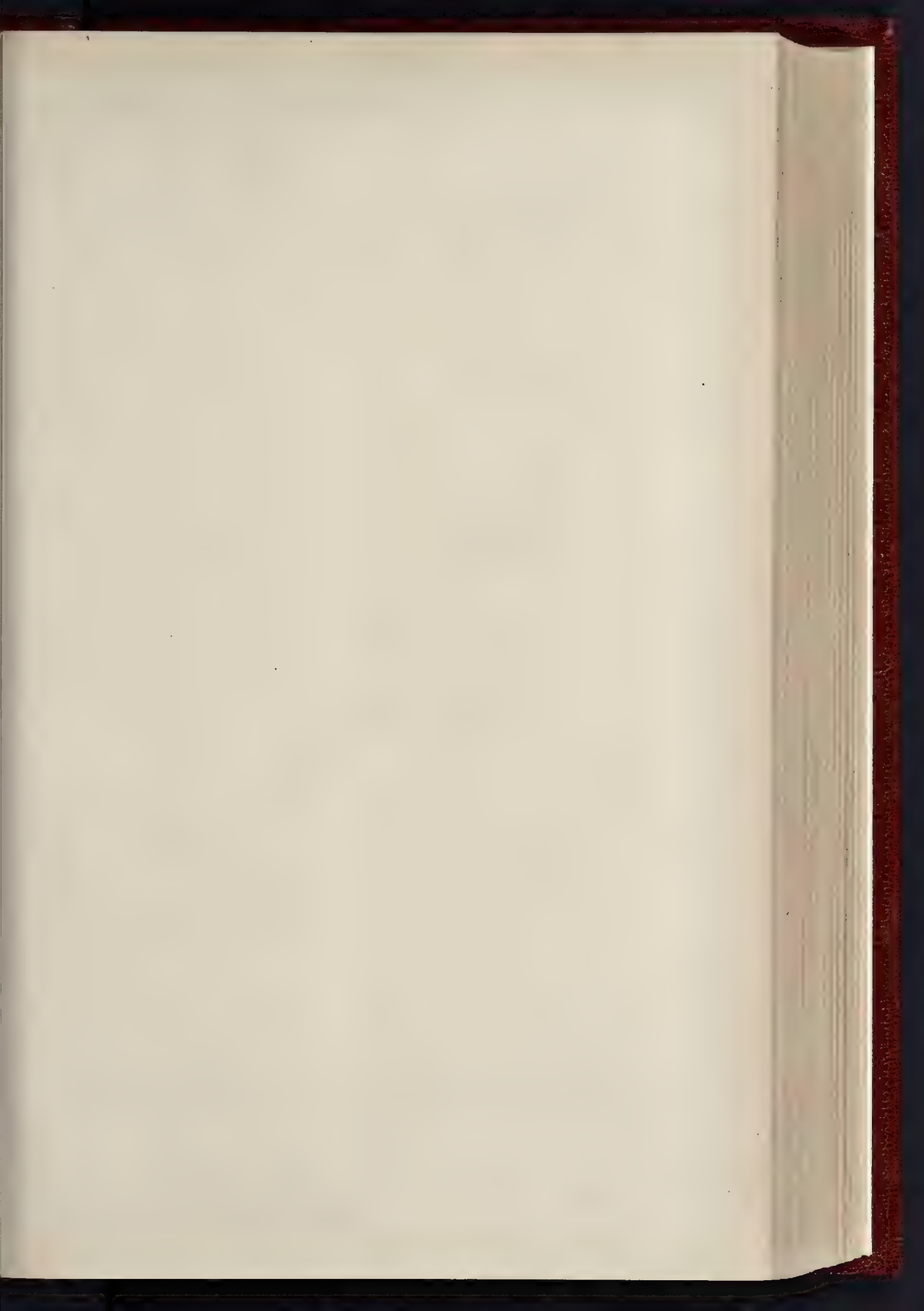
A few years ago Tangley Manor was in a sad state of neglect and decay, but has now fallen into good hands, and been admirably repaired and put in order without any interference with the old parts. The garden in front is enclosed with a fine stone and brick wall, with oval brick loopholes, and there is a moat all round that is now supplied with running water. The house was originally much larger. R. N.

#### British Medical Association.—The

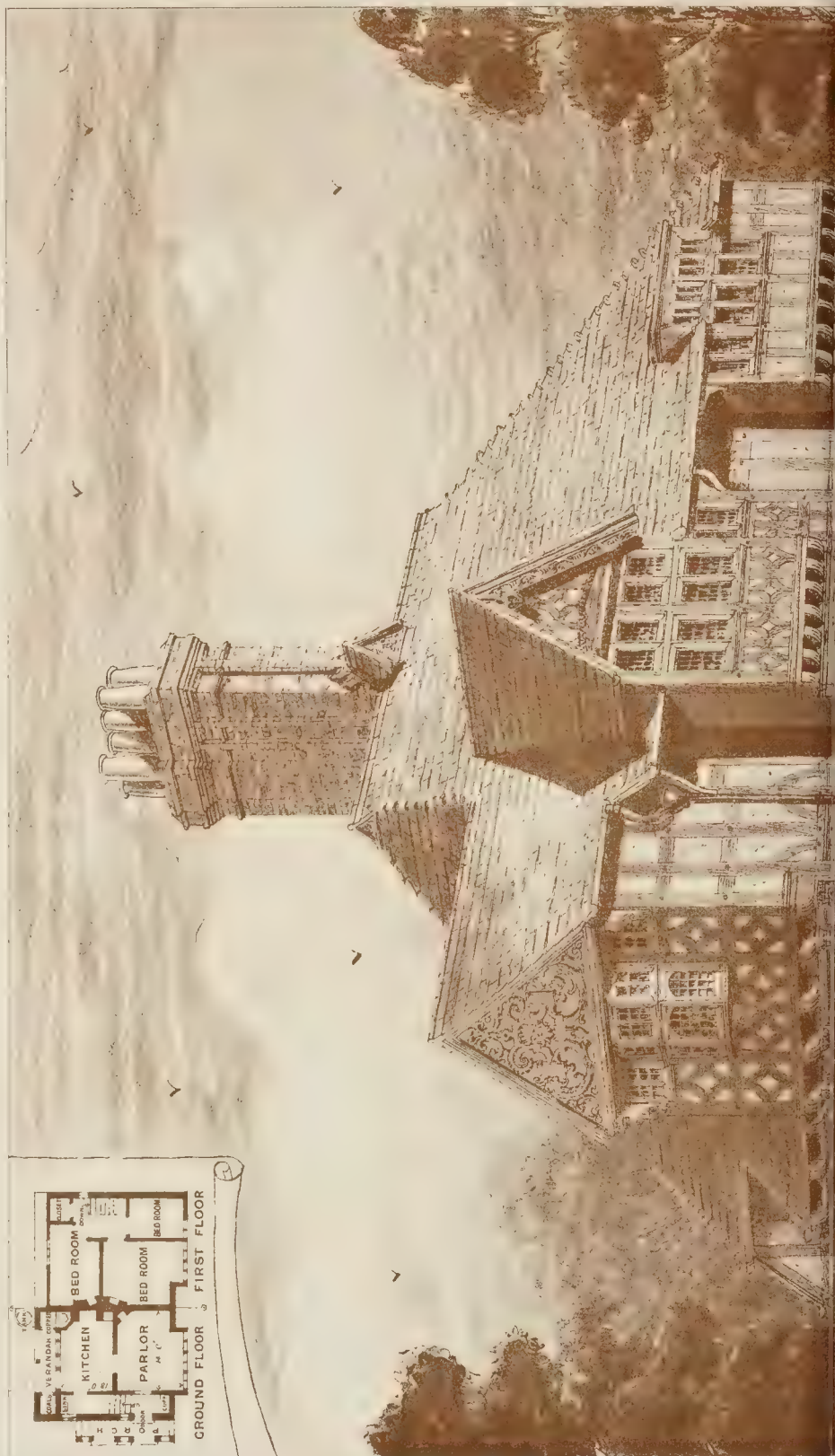
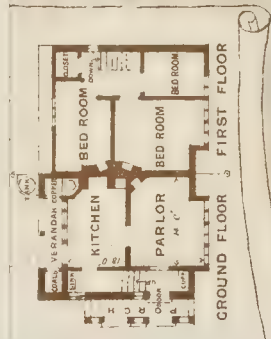
arrangements for the fifty-sixth annual meeting of the British Medical Association, in Glasgow, are now complete. The first general meeting for the transaction of business will be held on the morning of August 7th. On the following day the scientific work of the meeting, which is conducted by twelve sections, will be commenced. The public dinner of the Association will be held in St. Andrew's Hall on August 9th.

**A Locomotive in a Quicksand.**—One of the greatest difficulties of railway construction in the south-western States of America is the frequent occurrence of quicksands in rivers. In building the Kansas Pacific, and the Atchison, Topeka, and Santa Fé Railroads, according to Mr. H. L. Carter, railway contractor, there was frequent experience of this. From Western Kansas to the mountains, quicksands are to be found in nearly every stream, no matter how small, and to successfully bridge them required an expenditure out of all proportion to the width of the stream to be crossed. Pile-driving was tried, but the longest piles disappeared without touching the bottom. Then filling with earth and stone was attempted, and met with equally poor success, as the quicksands were apparently capable of swallowing the entire Rocky Mountains. The only means of crossing the rivers was found to be to construct short truss bridges across them. This was very expensive, but was the only thing to be done. As an instance of the practically bottomless nature of the quicksands, Mr. Carter cites the case of an engine that ran off the track at River Bend, about ninety miles from Denver, on the Kansas Pacific. The locomotive, a large goods engine, fell into a quicksand, and in twenty minutes had entirely disappeared. Within two days the company sent out a gang of men and a wrecking train to raise the engine. To their surprise, not a trace could be found of it. Careful search was made, magnetised rods were sunk to the depth of 65 ft., but there were no signs of the locomotive. It had sunk beyond human ken, and from that day to this the engine has never been discovered.—*Indian Engineer.*





THE BUILDER, AUGUST 4, 1888.



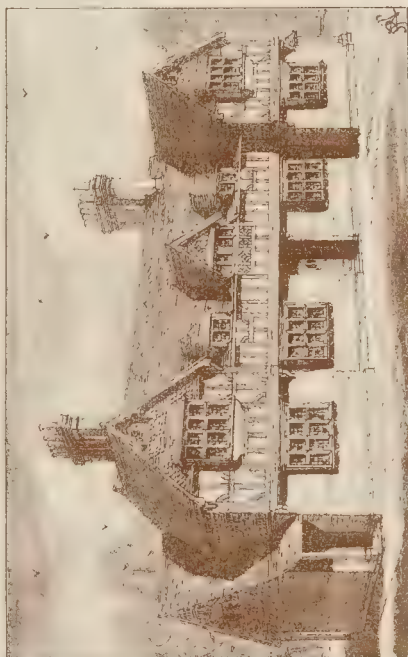




LODGE AND COTTAGE.



DOUBLE COTTAGE.



FOUR COTTAGES.

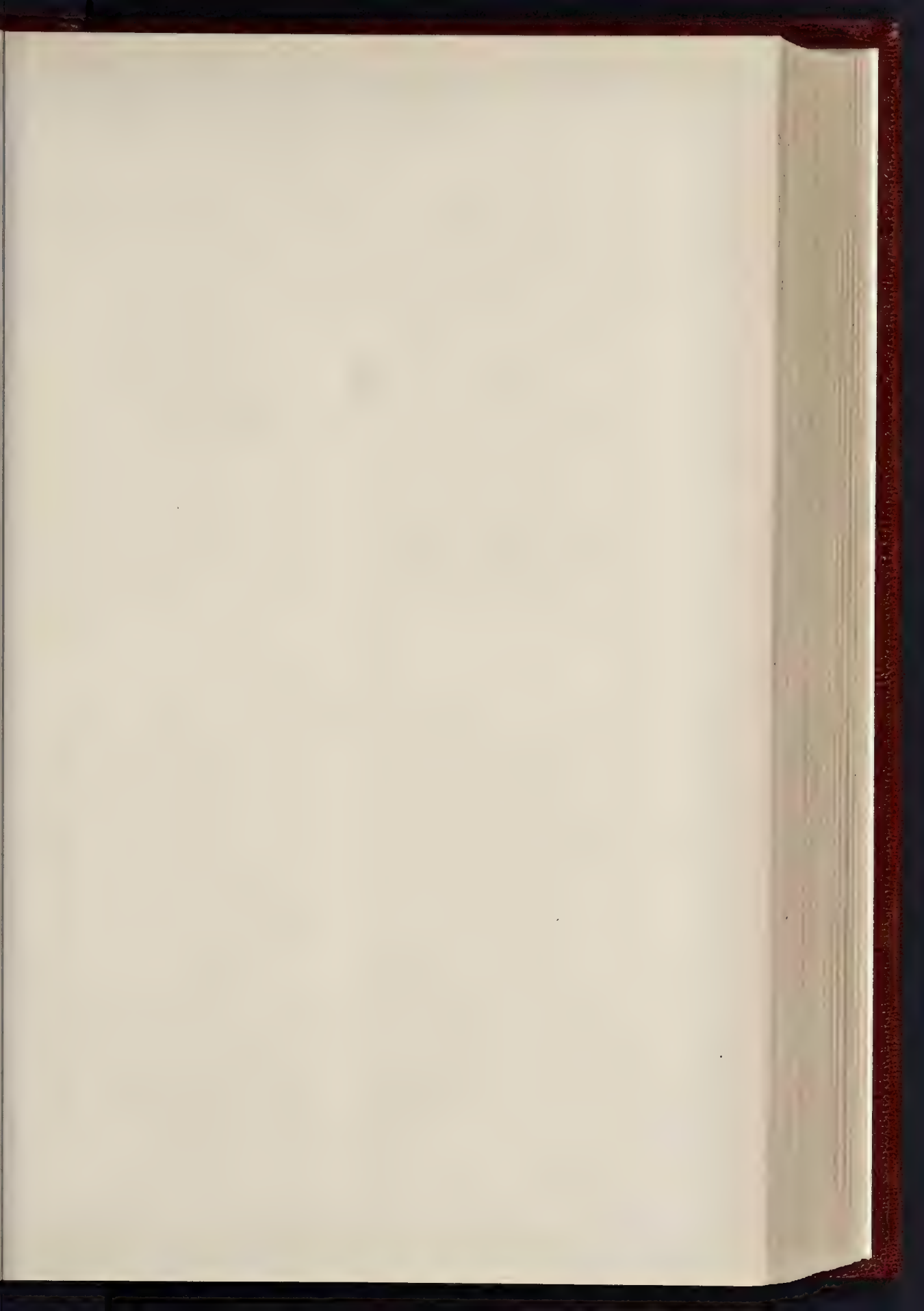


DOUBLE COTTAGE.

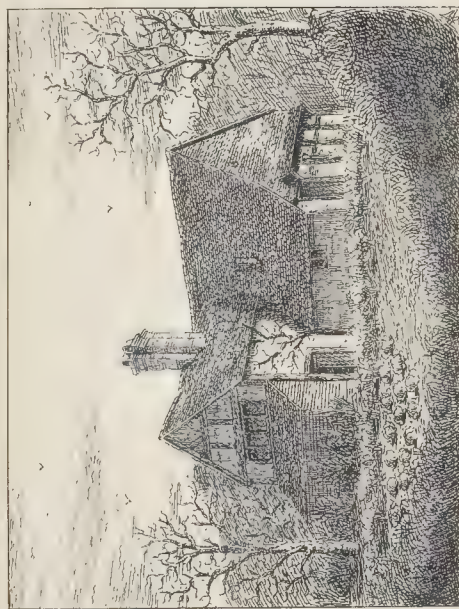
LODGE AND COTTAGES AT GREAT WARLEY, ESSEX.—MR. RALPH NEVILL, F.S.A., ARCHITECT.







THE BUILDER, AUGUST 4, 1888.



AT THORNCOMBE STREET



NURSLCOMBE BRAMLEY

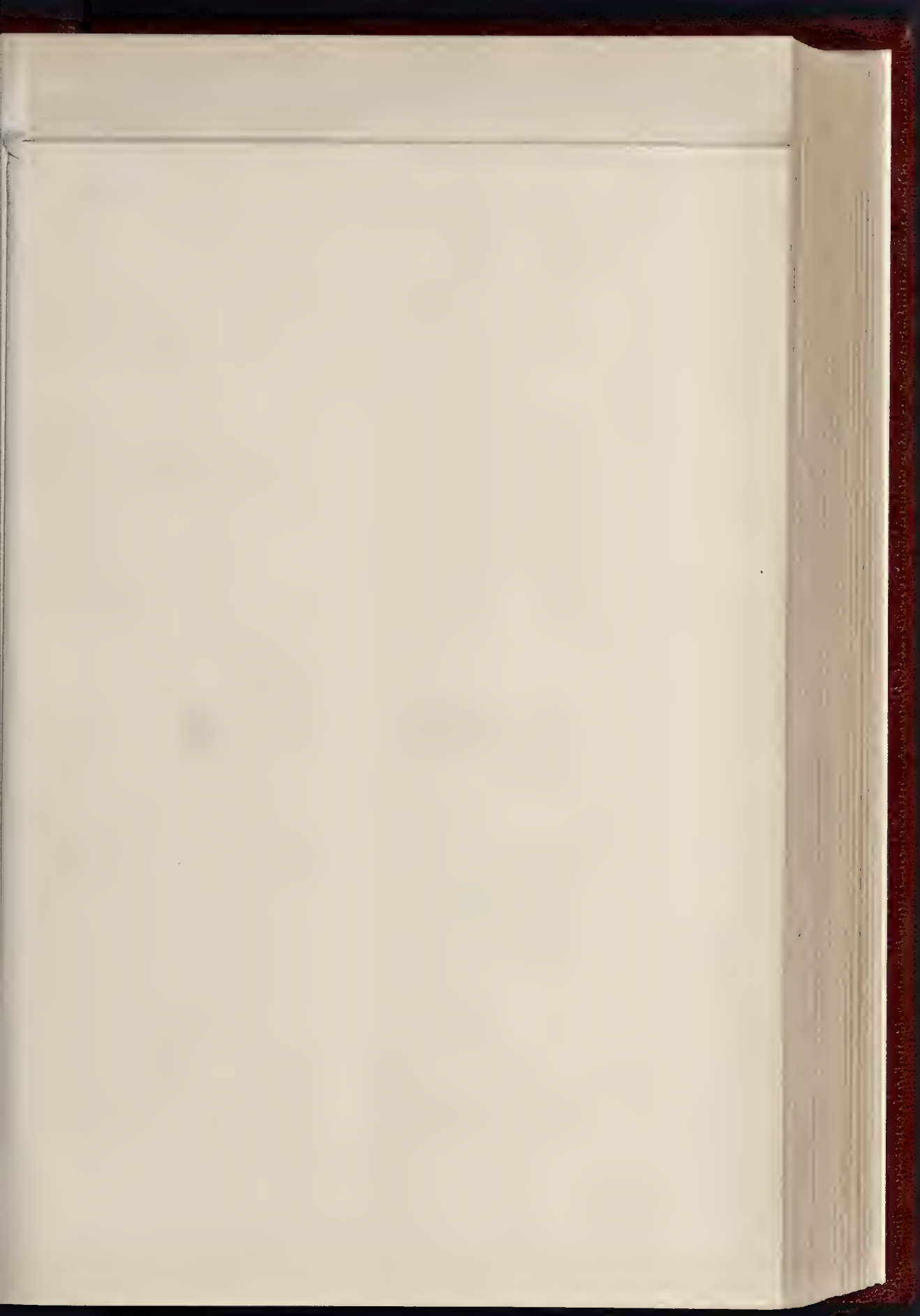


AT THORNCOMBE STREET



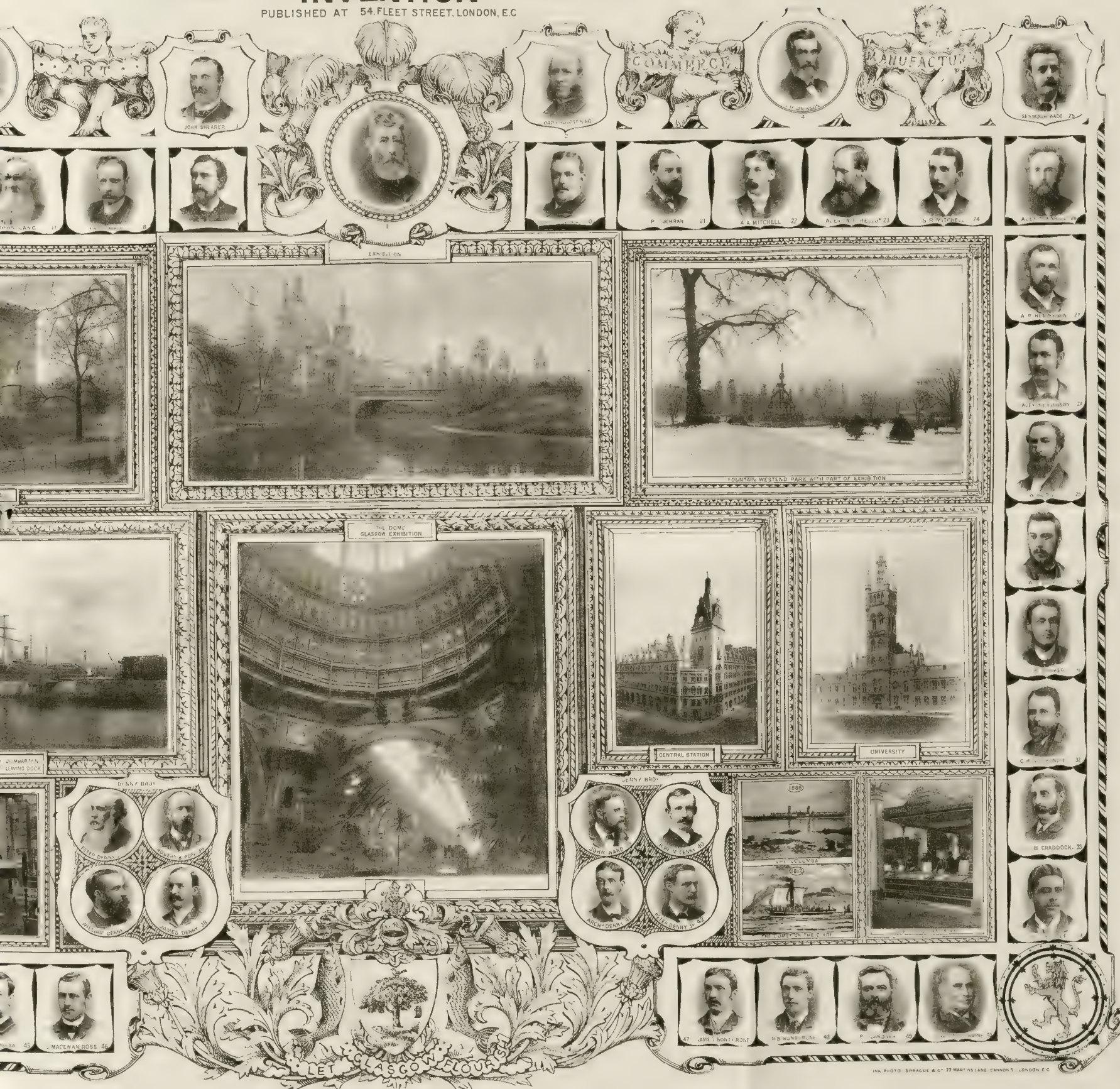
NURSLCOMBE BRAMLEY





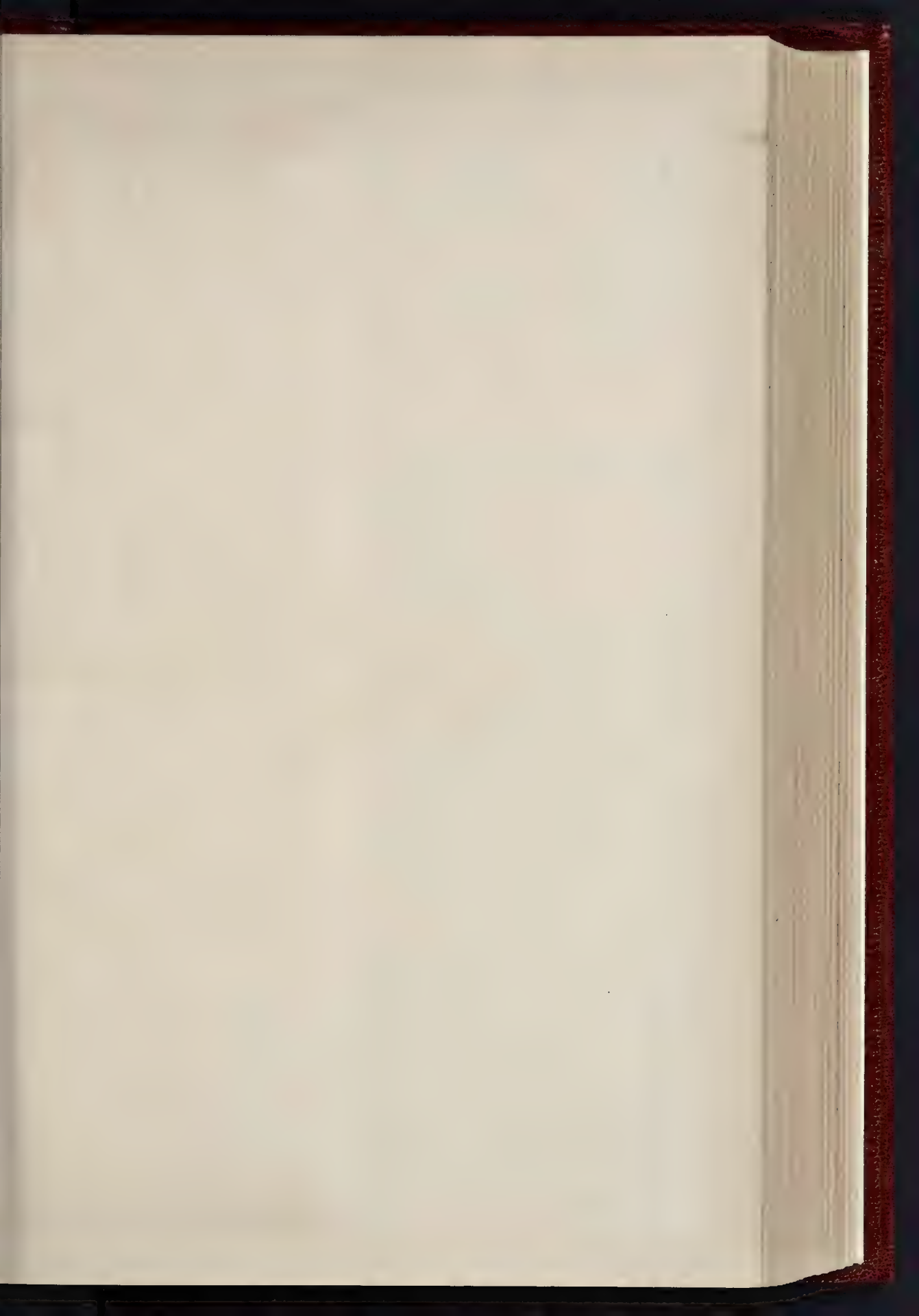


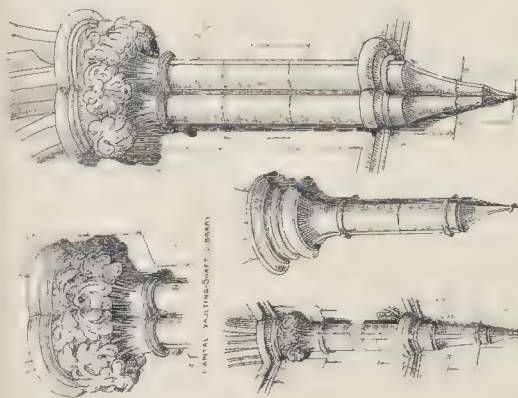










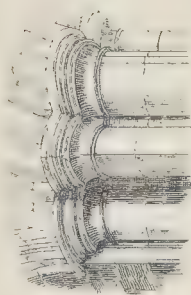


WEST WALL OF TRANSEPT

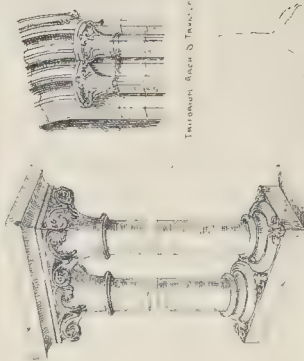
EAST WALL OF TRANSEPT



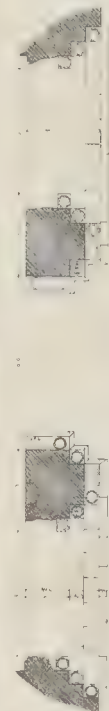
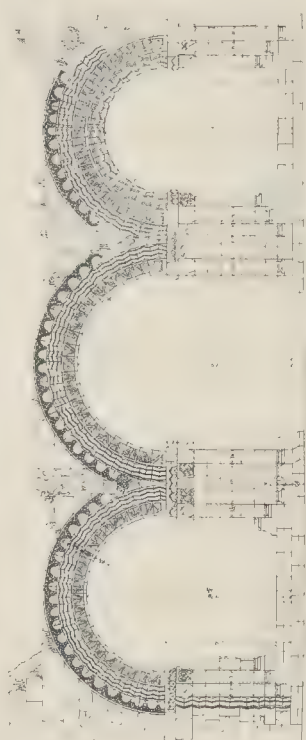
VIEW OF SOUTH TRANSEPT FROM NORTH WALL OF NAVE



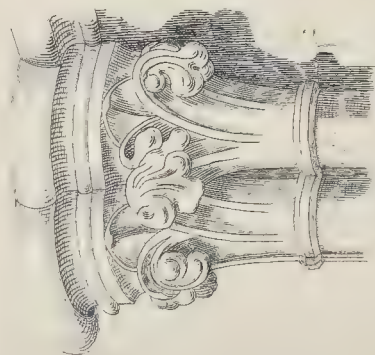
WEST WALL OF NAVE



TRANSEPT ARCH AND TOWER



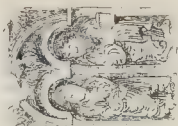
NORTH WALL OF NAVE



CAPITAL OF WEST WALL OF TRANSEPT

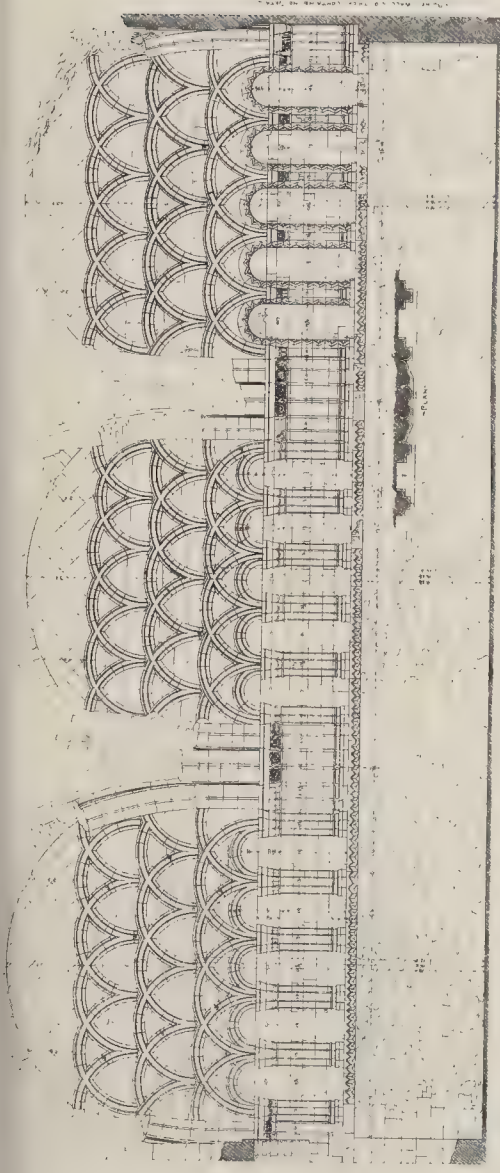


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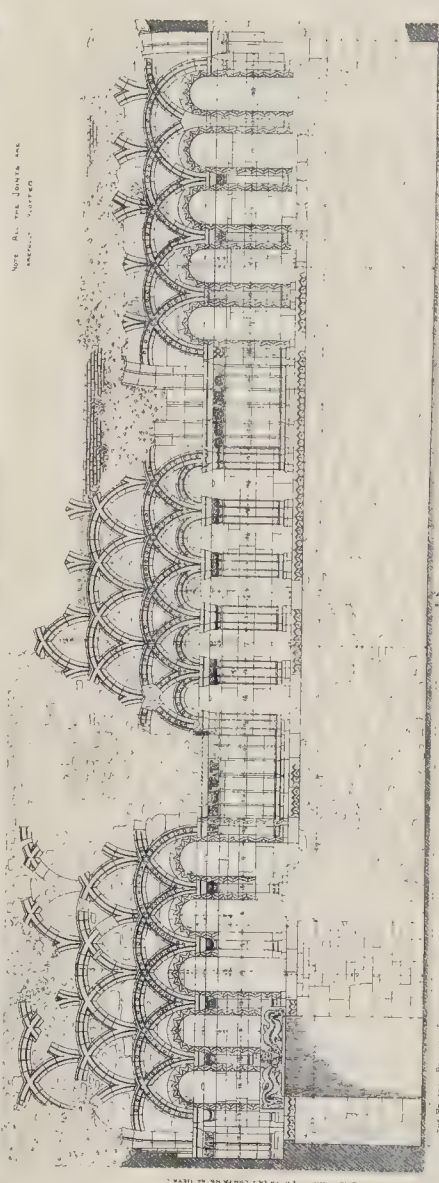
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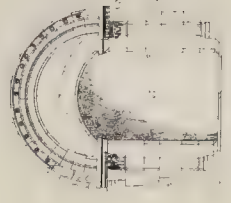
—NORTH ELEVATION OF CHAPTER HOUSE—

NOTE: See also details of Chapter House



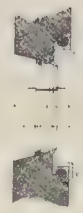
—SOUTH ELEVATION OF CHAPTER HOUSE—

NOTE: See also details of Chapter House

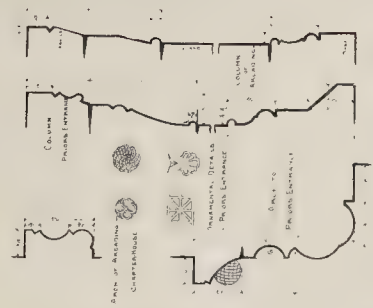


ELEVATION

Entrance to Chapter House  
NOTE: See also details of Chapter House



PLAN



CHAPTER HOUSE, WENLOCK PRIORY, SHROPSHIRE.—DRAWN BY MR. T. LOCKE WORTHINGTON, A.R.I.B.A.



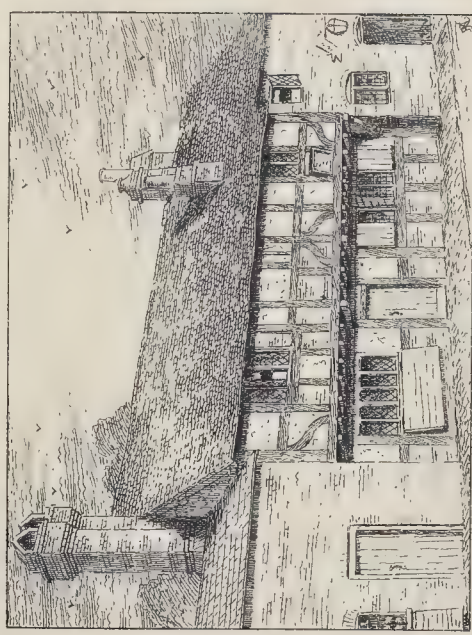




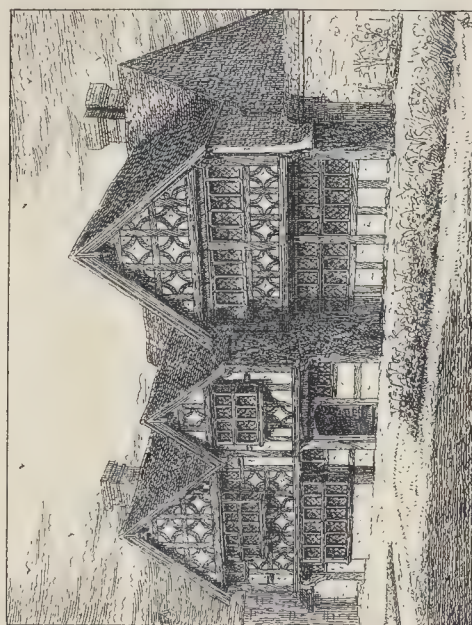
AT WONERSH.



AT WONERSH.



AT WONERSH.



GREAT TANGLEY MANOR.

OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.  
 PRINTED BY THE ARCHITECT, 15, MARK LANE, LONDON, E.C.



BRASENOSE COLLEGE, OXFORD: INTERIOR C

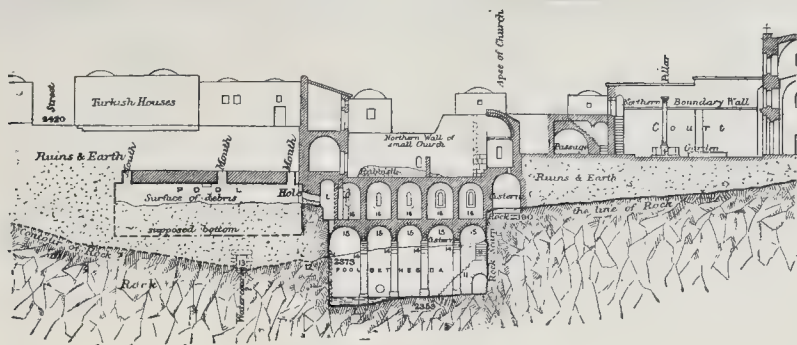




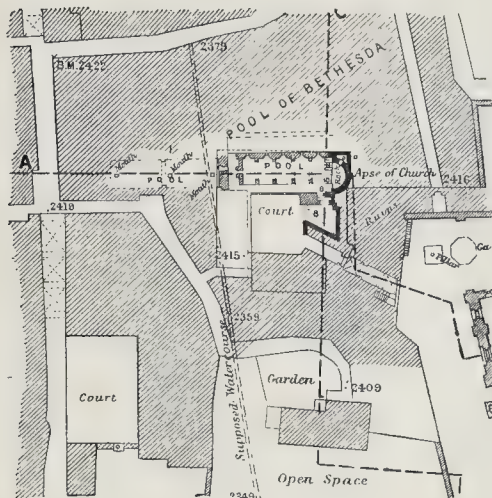
DRANGLE. -MR. T. G. JACKSON, M.A., ARCHITECT.







Section showing "Pool of Bethesda."



Plan showing "Pool of Bethesda."

#### THE POOL OF BETHESDA.

THE accompanying plan and section, reproduced by permission from a portion of the diagrams accompanying the last "Quarterly Statement" of the Palestine Exploration Fund, shows the plan and section of the supposed Pool of Bethesda, and its locality in relation to the church of St. Anne, the largest building in its immediate neighbourhood, a portion of which is shown at the right-hand extremity of the plan and section. The apse wall at the right-hand end of the "Pool" is the wall of a church of later date, which had been built over the five arches below. The arched recesses which appear to represent so well the "Five Porches" ascribed to Bethesda, are about 14 ft. long by 9 ft. wide.

#### THE "SHONE SYSTEM" OF SEWERAGE.

At the recent annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held in London, a paper was read by Lieut.-Col. A. S. Jones, V.C., Assoc.-M. Inst. C.E., of Wrexham, entitled "Ten Years' Experience of the Shone System." In the course of the paper the author said:—

It is very nearly ten years since the Shone system was introduced to the world in a paper read by its inventor at the Congress of the Sanitary Institute of Great Britain, held at Stafford on October 3, 1878.

Of course the lifting and propulsion of liquid or semi-liquid matter by compressed air automatically admitted and discharged, or blown off, by a machine called the pneumatic ejector, has always stood forth as the distinguishing salient characteristic of the Shone system, and the novelty and efficiency of that machine absorbed much attention.

But the ambition of the inventor led him to propound a complete system of sewerage and house-drainage on the most scientific sanitary principles, which principles can now be applied at reasonable cost, irrespective of any of the local conditions which, in the absence of Mr. Shone's invention, have rendered it difficult or too expensive fully to observe those sanitary principles.

He also provided an automatic flush-tank for the temporary storage and concentrated discharge of sewage, slops, or clean water, which has been usefully applied; but there is no other novel appliance in the Shone system, nor any departure from theoretical principles which have been laid down by other engineers.

The distinction between theory and practice is very great, and, where natural fall is deficient or absent, engineers have been sorely tempted to content themselves with sewers of deposit.

Economical considerations had also led to the construction of large tank sewers, with outlets closed for many hours every tide at seaside places, besides all the other lapses from a high standard of workmanship to which underground works are peculiarly liable, and it seemed high time for a reformer to cry out for a stricter approximation to true principles.

The advantages of a separation of rainfall and subsoil water as far as possible from sewage had only lately been fully admitted by the engineering world when Mr. Shone came on the scene, and perhaps some embers from the thirty years' strife waged by Phillips, Menzies, and others, on behalf of the separate system, were still alive. Consequently, it may not have been the most judicious course to introduce a new appliance by forcibly contrasting certain existing works with estimates of others which might have been designed in their place if the

new invention had been available at the period at which those works were executed.

And the adoption of the separate system was no *sine qua non* as regards employment of pneumatic ejectors; on the contrary, it was obviously against Mr. Shone's pecuniary interest, as operating to reduce the number and size of the ejectors which would be required to lift both sewage and rain-water together in the combined system.

But enthusiasm is not unknown among inventors, and Mr. Shone naturally desired to express the true theory of his system in as perfect a manner as possible. He therefore entered heartily into the advocacy of the separate system, because it would enable him to adjust the sizes of his pipes and their gradients to a more regular flow of sewage, and to show greater economy in the drainage of any town than would be possible under the combined system.

Mr. Shone, in fact, began with the careful compilation of a tabular statement of the discharge from various-sized pipes laid on different gradients, indicating at a glance those which would give a self-cleansing velocity approaching 3 ft. per second, and other particulars which should be calculated on in designing works of sewerage.

For this table alone much credit is due and has been accorded to Mr. Shone by many engineers, who refer to it with every confidence, and have found it practically useful.

The table contains two columns, which give the "population for which the pipes would be suitable at the various velocities, &c." on the hypothesis that 15 or 25 gallons respectively per head per diem would be the measure of sewage produced by the population; and it has been erroneously assumed that Mr. Shone intended the theoretical figures set forth in one or other of those columns to be adopted in designing works, without reasonable allowance or practical margin, whereas he only intended to bring forcibly before engineers the startling divergence of ordinary sewerage from the true theory, and to suggest closer approximation to the latter.

But, independently of this misunderstanding, Mr. Shone has had to contend, from the very first, with the commonly-received doctrine that compressed air is a very expensive agent.

It would hardly be right to call that doctrine a prejudice, because it rests upon special facts, but it belongs to that class of fixed beliefs which are most prejudicial to early recognition of the value of inventions, which at first sight appear to set those beliefs at defiance.

Now the doctrine rests only on these facts, viz. :—

1. That, in all pre-ejector applications of compressed air, it has been used as a motor like steam to drive a piston, in rapid motion to and fro, in a cylinder.

2. That there is considerable waste of power, by the necessary generation of heat, in compressing air beyond three atmospheres.

3. That until recently air-compressing engines were defective in design and construction.

But in the Shone system the air itself is a slow-moving piston employed to lift the sewage, and its pressure need not exceed the limit below which the waste of power is of less consequence.

This should be obvious to any one who will take the trouble to understand the action of a



pneumatic ejector; but it is to be feared that there are still men who think or assert that Mr. Shone disputes the three facts on which their doctrine depends.

Engineers designing works of sewerage must often have regretted being under the necessity of leading all the sewage of a large undulating area by valley lines to some common sumpt, whence the whole has to be pumped up to an outfall (situated, perhaps, at a lower level than the source of a large portion of the sewage) simply on account of the prohibitory expense of establishing several pumping-stations, each requiring its own engine, boilers, pumps, and attendance on the spot.

And here in the Shone system they have the means of collecting each district's contingent of sewage by sewers at little depth below the surface, converging to a point on no lower level than that required to give good gradients to the short lengths of the district sewers, with the certainty that so soon as a regulated volume of sewage shall have been collected at such district centres it will automatically be passed on to the main outfall.

This is accomplished either by lifting and discharging, into a neighbouring gravitating sewer leading to the outfall, or through a sealed pipe which may follow the natural ups and downs of a road, and in neither case is the power expended greater than that which is sufficient for lift and friction, counting the lift only as difference of level between the district ejector and final outfall, instead of having to pump the sewage back again all the height from which it has gravitated to the single sumpt, as in the old system. It may be said, therefore, that the Shone system consists in the arrangement of such convenient districts, each with its own independent outfall in an ejector station to which proper gradients can lead the sewage through small self-cleansing pipes laid within a moderate depth from the surface, and in calculation of each ejector required to lift the contents of each ejector when full either into a gravitating sewer or through a junction with the common rising main to the common outfall.

The saving, in depth of excavation, thus effected may often cover the whole cost of ejector station and plant, and it only remains to keep up in any convenient place, central or otherwise, an air-pressure equivalent to the highest lift in the system to secure the regular evacuation of all the ejectors immediately on their being filled, and without loss of power, because reducing valves adjust the pressure applied in each case.

Mr. Shone's two chief opponents have lately acknowledged the advantage of this subdivision of the area to be sewered into independent districts, by proposing a similar arrangement with hydraulic instead of pneumatic lifting power, thus preferring, in point of fact, to employ four pistons and four cylinders to accomplish the end which Mr. Shone attains with two of each.

But it is not only the extra friction involved in a high-pressure\* water-engine which conflicts with common sense as regards such a substitute for the pneumatic ejector, because the sewage which falls into the latter is expelled bodily from the bottom of the receptacle, so that no screening and accumulation of rags and heavy matter (which require constant attention at every sewage pumping-station) can take place, and the ejectors can be left for days to work under a public street without being visited, while the storage and removal of foul screenings from such a situation would be an intolerable nuisance as well as a cause of expense.

Then, moreover, all the water, after it had worked the hydraulic pump, would generally have to be pumped away like so much additional sewage, and the machinery and extra thickness of pipes for the much higher pressure of water than that of air must make the cost of installation much greater in the one case than the other.

And against these arguments we have only vague references to the loss by heat in compressing air supported by arithmetical calculations founded upon very insufficient data, and all this while practical men are constantly improving air-compressing plant with a firm conviction that the power can be produced so economically on a large scale (as in the case of the Birmingham Compressed Air Company) that it can be distributed at a profit to its producers, when paid for, by those who require to use it.

\* Say 400 lb. the square inch as compared with air at 45 lb.

in place of steam as a motor for small steam-engines, at less cost than they can produce the steam.

*A fortiori* must economy be greater in the case of ejectors, since the compressed air directly moves the sewage by expansive force, and forms, as it were, a continuous elastic cushion from which successive portions, exactly equal in volume to the sewage they have displaced, are cut off and harmlessly blown away.

The distinction between direct and the ordinary indirect action of compressed air or high-pressure water (as respectively exemplified at Windsor Castle and Torquay) seems to make the Shone system much more economical than either of the others. In the ejector system two pistons and two cylinders alone are employed, i.e., one of each for steam as prime mover and the other to compress air.

But in the old system, when the compressed air or high-pressure water, as the case may be, reaches the scene of operations, either agent has to move a third piston in a third cylinder, and finally we have the heavy pump plunger working as a fourth piston in a fourth cylinder, amid all the convulsions of a solid body with an incompressible heavy fluid.

The valves may be the same for pump or ejector, with, however, this important difference, as to wear and tear in favour of the latter, that those for the pump must move over at least fifteen times more frequently than in the case of the ejector, for equal volumes of sewage lifted. We need not concern ourselves further with the recent controversy published by *Iron* on the Margate sewerage. At any rate the main object of this paper is to record the actual practical facts of the last decade, though it seemed desirable to open the matter with the above restatement of the Shone system, and to notice the bitter hostility it has encountered in one or two quarters whence it might have been least expected.

It is true that general assertions to the effect that "an enormous loss of power arises in the compression of air, as the whole (*Q*) of the power exerted appears again in heat," and that 25 lb. or 27 lb. pressure was required to lift sewage 6 ft. on Mr. Shone's system, are palpably absurd, but when they emanate from an engineer who has made a reputation by his writings, and as an adviser of sanitary authorities, such bodies may well be falsely alarmed.

Borough engineers well know the difficulty of moving public bodies out of an old groove of practice, and can understand Mr. Shone's obligation, on the other hand, to all those public-spirited engineers and others who have seconded his effort to conquer that difficulty; but the fact is that the principle of his system is so thoroughly sound that nothing could upset it.

Eastbourne, under the influence of Mr. G. A. Wallis, C.E., and its Borough Surveyor, Mr. C. Tomes, made the first plunge with three large ejectors to drive the whole of its sewage out to sea at all heights of tide. This first installation was of course no adequate example of the system, but it established once for all the thorough efficiency of the pneumatic ejector as a remedy for tide-locked sewers, and its ability to cope with all the variations of flow due to the combined system.

Two miles and a half of large outfall sewer, which had all the inconvenience of an elongated cesspool backing up the flow of contributory sewers in the town, except at low tide, was at once entirely relieved, even at highest tide, by passing its contents through the ejectors to sea, and this improved state of things has been fully maintained for the last eight years.

But there remained certain low-lying areas in the town of Eastbourne, and the Sanitary Authority, fortified by experience, proceeded step by step to establish subsidiary ejector stations in these places to lift their sewage into the gravitating sewer, bringing the compressed air to work them by a pipe nearly three miles long from the original air compressors.

The first of these steps in advance of the original installation was taken in 1882, after two years' experience of the latter, the second in 1883, and the third is now in progress, all apparently supplied with power from the original air compressors, and the result of this healthy gradual advance has been to make Eastbourne a very fair example of the judicious application of the Shone system to remedy the necessary defects in one of the best examples of sewerage to be found in seaside towns as such works used to be designed ten years ago.

Mr. James Lemon, C.E., one of the earliest

converts to the Shone system, and Mr. V. Gamon, Borough Surveyor, followed very closely on the first Eastbourne ejectors, by introducing a small one into the sewerage of Winchester, worked, as are railway brakes, by a Westinghouse air-compressor.

Then Mr. Thomas Longdin, Borough Surveyor, started two ejectors at Latchford, near Warrington, in 1882, and four or five years later applied two other ejectors for transmitting part contents a distance of about two miles, thus effecting a great saving in the previous cost of carting to the depot.

Mr. W. B. G. Bennett, C.E., followed with one ejector of 700 gallons capacity, for driving the effluent from precipitating tanks at Southampton against high tide, and two of 360 gallons each to lift from low-level sewers. A novel alternative use is made of one of these small ejectors to discharge the precipitated sludge from the tanks to other works one mile distant, and no difficulty has been experienced with either pail contents or sludge. Mexborough (Californa), Darlaston, Wednesbury, Compton Gifford, &c., followed suit with from two to five ejectors each, not to mention clubs, restaurants, &c., in London.

In Henley-on-Thames, on a small scale, is the town of Henley-on-Thames, the Shone system is perhaps more fully carried out than in any other instance of its application as yet completed; and the following quotation from a pamphlet by Mr. F. Ball, ex-Mayor of Henley, shows how much it has given satisfaction:—

"Advantages were gained (by adopting the Shone system) which it will be well to enumerate.

1. Small sewer-pipes laid with good inclinations at a great depth, watertight, and mostly above the subsoil water-level, discharging the sewage into an ejector, whence it becomes effectually trapped.

2. The rapid transit of the sewage into an ejector before decomposition sets in.

3. Reduced cost for flushing when that operation becomes necessary, the small sewers necessarily being more effectively flushed with less water than larger ones would be.

4. Freedom from bad smells emanating from the manholes; for, the cubic capacity of the sewers being small, the volume of air in contact with the sewage is proportionally small also, and, being constantly changed through the rapid flow of the sewage, the latter cannot become stagnant and dangerous.

5. Less risk of the spreading of diseases; the noxious matters entering the sewers of one district not being in any way communicated to another.

6. The facility afforded of extending the system to new districts irrespective of levels in either.

7. The reduction in cost both in the initial outlay and in the working expenses."

Such testimony as this, after a year's trial at Henley, with a lift of 140 feet, must be very satisfactory to Messrs. Shone & Anlt, the engineers, and Messrs. Hughes & Lancaster, the sole licensees of the patents, as all will acknowledge who know the difficulty, time, and money required to introduce a revolution in engineering practice.

But the careful investigation by a Select Committee of the House of Commons, which resulted in Mr. Shone's appointment as engineer to carry out a thorough reform of the sewerage of the Houses of Parliament, was a further guarantee of the worth of his system, and the impetus thus acquired is very great,—in fact, large works in Moscow, Rangoon, Lowestoft, Heston, and Isleworth, &c., show that a world-wide interest is now awakened, and amongst others the following engineers have either prepared or carried out, or are now preparing schemes on the system,—viz.:—Messrs. Thomas & Charles Hawkesley; Messrs. Bateman, Parsons, & Bateman; Messrs. Bailey, Denton, Son & North; Mr. G. Staiton, M. Inst. C.E.; Mr. E. Pritchard, M. Inst. C.E.; Messrs. Gottlieb & Beazley, Mr. F. C. Stilleman, C.E.; Mr. J. C. Inglis, C.E.; Mr. W. B. Bromley, C.E.; and Mr. J. C. Mellis, C.E.

The works undertaken at Rangoon, in British Burmah, are very extensive, and provide not only for removing the sewage of a population of 50,000, but for a high-pressure water supply to be maintained from the same air compressors.

These and other sewerage schemes now in progress will have a discharging capacity of about 8,600,000 gallons per diem, and the fact that several sanitary authorities in different parts of the world have let contracts to provide for that aggregate amount of work shows that the Shone system has gained considerable confidence.

But work actually performed is the basis of that confidence, and it has occurred to the writer to make an approximate estimate (on the basis of population sewered) of the sewage which has been lifted by pneumatic ejectors.



to the present date. This amounts to nearly 48,000,000 tons of sewage raised to heights ranging from 6 ft. to 140 ft.

Besides this, Mr. Bennett, C.E., estimates that nearly 5,000 tons of sludge have been moved one mile at Southampton; and Mr. Longdin, C.E., returns the quantity of excreta or pail contents as about 11,000 tons transported about two miles at Warrington.

Considering that four-fifths of the period of time, and a large amount of brain work and paper work have necessarily been expended in preliminary demonstration of the merits of the system, the above statement, of actual work done in moving sewage, can hardly be thought insignificant as the record of the first decade of the Shone system, while the number of ejectors already ordered and in progress is very large.

As an illustration of what the above figures mean, it may be remarked that the air-pressure employed on the above work would more than suffice to remove down to Sea Reach one-sixth part of the annual flow of sewage at present discharged at Barking and Crossness, i.e., about 170 million gallons per diem for some sixty-three days.

The writer is not in a position to state the cost of the work done, or to compare it with that of lifting sewage in any other way; but the fact that so many different sanitary authorities, who have paid the cost, are generally satisfied with their experience is encouraging, and the time will doubtless arrive when some common basis of comparison may be agreed upon and results carefully noted.

Hitherto, however, so much heat and friction has arisen in argument between the advocates of low-pressure air and high-pressure water, on technical points such as the curves of adiabatic and isothermal compression, and on the efficiency of prime movers, that it is hopeless to look for speedy agreement to abide by the issue in foot-pounds and coal consumption, because wear and tear of plant would still form a bone of contention.

Under existing circumstances, therefore, the practical view of this problem must surely be "*Solstitur ambulando*."

In the discussion which followed,

Mr. R. W. Peregrine Birch said that there could be no doubt that the Shone system had a very good champion and a very strong advocate in Colonel Jones. But he (the speaker) did not share the gallant Colonel's view that Mr. Shone was the introducer of self-cleansing sewers, or of sealed rising mains or drain-pipes. He (Mr. Birch) would very much like to see some figures showing the cost of lifting sewage by the Shone ejector, as compared with the cost of lifting by steam pumps, or pumps worked by gas-engines or other motors. He would also like to know whether the net average work done by the Shone ejectors at the Houses of Parliament exceeds what could be accomplished by 1/10 of a horse-power if steam pumps were to be employed for lifting the sewage there. Without professing to have read all that had been said by Mr. Baldwin Latham in the controversy that had been referred to by the reader of the paper, he thought that Mr. Latham's views on the matter were sound. He (the speaker) believed that the Shone machine was an expensive and even extravagant appliance to use where only the mere pumping or lifting of sewage had to be considered.

Mr. James Lemon (Southampton) said that as his name had been mentioned in the paper, he should like to say that it was quite true that he was one of the earliest converts to, he would not say, "the Shone system of sewerage," which was a somewhat misleading phrase, but to the Shone ejector. The reason why he (the speaker) adopted the ejector at Winchester was that he wanted to put his pump in one place and his power in another place. Only by using Mr. Shone's pneumatic ejector was it possible to do this. In such exceptional circumstances only could the ejectors compete with the best kind of steam-engine and pumps. He agreed with Mr. Birch that it would have been desirable that the paper should have given some particulars of the cost of lifting sewage by the Shone ejector as compared with the cost when a good steam pump was used. As far as his (Mr. Lemon's) experience went, the Shone ejector was a costly machine as compared with good pumps.

Mr. E. Fritchard (Birmingham) said that as his name also had been mentioned in the paper, and as he had had considerable experience of the Shone system, he should like to say that he agreed with both of the previous speakers

as to the comparative costliness of the work done by the Shone ejectors as compared with that done by good pumping engines of the best type. But, as had been said, the Shone ejector possessed great merits as a substitute for pumps in exceptional situations. If Mr. Shone had been a little extravagant in appraising the merits of the ejector, it should be remembered that Mr. Shone was its inventor, and that, like all inventors, he was an enthusiast. Personally, he (Mr. Fritchard) must acknowledge Mr. Shone's services in connexion with the elucidation of the sewage problem, and he could testify to the value of the elaborate tables which he had prepared—tables which he (the speaker) had found of great use, and in which he had not been able to detect any error. Although it was some time before he had felt justified in advising clients to adopt the Shone ejectors, he was glad to be able to say that where, under exceptional circumstances and to meet special conditions, they had been adopted, their use had been most advantageous to the districts concerned. But at the same time they must, as engineers, protest against the notion that the ejector could, under ordinary circumstances, be a competitor with the pump. There was inevitably and necessarily a loss of power by the use of compressed air, and to expect that compressed air could give us back all the power absorbed in compression was as futile as to attempt to solve the problem of perpetual motion. He thought that the term, "Shone system of sewerage" was to a great extent a misnomer. Self-cleansing sewers, which were claimed to be an integral part of the "Shone system," were no new thing; they had been attained to many years ago by such veteran sanitarians as Edwin Chadwick, Robert Rawlinson, and their disciples. But Mr. Shone deserved the credit, which no one grudged him, of having devised the ejector known by his name—an appliance for lifting liquids, and which, though costlier in working than an ordinary pump, yet possessed exceptional advantages for special situations, inasmuch as it could be placed at a distance remote from the power which actuated it.

Mr. G. R. Strachan (Chelsea) spoke in support of these views.

Mr. E. G. Mawbey (York) said that borough engineers, and engineers to Local Boards and other authorities, often had reason to complain of Mr. Shone's methods of propagandism. No sooner was any scheme of sewerage proposed or prepared, than Mr. Shone flooded the place with pamphlets and other printed matter vaunting the advantages and superiority of his so-called "system." He was, no doubt, within his right, as a man of business, in doing this; but when he claimed that his "system" was as economical in cost and working as any other, and that it was equally suited for all situations, he was certainly going too far, and he often entailed upon the responsible professional advisers of public bodies a great deal of trouble in answering and refuting him.

Mr. Lobb (Hanley) said that as his name had been mentioned in the paper as having adopted the "Shone system," he wished to say that he shared generally the views of previous speakers; he did not regard the Shone ejector as being likely ever to generally supersede good pumping engines; but in special situations, and as an adjunct to existing sewerage systems, it had been found to be of great service, and notably so at Fenton, in Staffordshire.

Mr. J. Gordon (Leicester) said he came to the consideration of this question with a perfectly open mind; but how were they to decide upon its merits when such material particulars as cost of working were not given in the paper, only mere assertions? As practical men they did know what it cost to lift sewage or water by steam-pumping; what they wanted were figures showing the cost of doing the same work by the Shone ejector. As to the works carried out at the Houses of Parliament, at Eastbourne, and other places mentioned in the paper, was it at all certain that in some, at least, of the instances the work could not have been done as satisfactorily, and perhaps more cheaply, by the aid of good pumping engines? He thought that Col. Jones was not well advised in placing himself so strongly in the position of an advocate.

Mr. Cooper said they were told that where the Shone system had been adopted there was a perfect immunity from smells, but that was hardly the case at Henley. And, whatever might be the explanation of it, the death-rate of Henley had increased since the "Shone system" was adopted. In 1866, before

the Shone system was adopted, the death-rate of the town was 17.8 per thousand; in 1887, after the system had been applied, the death-rate rose to 19.7 per thousand. Now at Henley the sewage was lifted up a considerable height on to permeable ground, and it appeared to him (the speaker), from an inspection of Ordnance sheets of the district, that it was possible that some of the sewage found its way into the well-springs from which the water-supply was obtained.

Mr. Eachus (Edmonton), Mr. Hall (Torquay), Mr. Silcock, and Mr. De Courcy Meade (Hornsey) having each said a few words,

Mr. Ball, ex-Mayor of Henley, said that the smells referred to were in no way attributable to the Shone system, which had been adopted at Henley only after very conclusive demonstration that it was cheaper and better-suited for local requirements than any other system.

Mr. Fowler (Leeds) said that a great deal of the time occupied in this discussion would have been saved if Mr. Shone had, through Colonel Jones's paper, informed the meeting of the exact cost per unit of work of the Shone ejector.

Mr. Ellice-Clark, the President, in closing the discussion, said he stayed in Henley during the Regatta week, and a more stinking town he never was in, and he wrote to the Mayor and told him so. But he understood that Mr. Shone was not responsible for the way in which the sewers were ventilated. It was a great pity that the paper read by Colonel Jones did not contain more facts and figures in support of its assertions. Mr. Fowler had touched the keynote of the whole discussion. We wanted units for comparison, and without them no satisfactory conclusion could be drawn.

Colonel Jones, in reply, said that, as to the question of cost of working, it was hardly to be expected that the inventor of the Shone ejector, with his present limited experience of the use of that appliance, and with comparatively little data to go upon, would show his hand, or commit himself to any definite statement of cost, just at present.

#### NATIONAL ASSOCIATION OF MASTER BUILDERS OF GREAT BRITAIN.

THE half-yearly meeting of this Association was held on Wednesday, the 25th ult., at the offices of the Liverpool Master Builders' Association, 6, Lord-street, Liverpool. Mr. Robert Neill, jun., was in the chair, and representatives from London, Manchester, Liverpool, Bristol, Birmingham, Bradford, Leeds, Nottingham, Wolverhampton, Cambridge, Bolton, Wigan, St. Helen's, Crewe, Lancaster, Huddersfield, Stalybridge, Lincoln, Hull, and Northampton, were present.

The following report of the Council was read and adopted:—

##### "The Twenty-first Half-yearly Report. 23rd July, 1888.

The Officers and Council beg to lay before the Members of the Local Associations and Master Builders and Contractors of the country, their twenty-first Half-yearly Report.

The Association now comprises the following local Associations and single members:—

|                       |                                        |
|-----------------------|----------------------------------------|
| Ashton-under-Lyne     | London                                 |
| Barrow-in-Furness     | Manchester and Salford                 |
| Birmingham            | Northampton                            |
| Bolton                | Nottingham                             |
| Bradford              | Oldham                                 |
| Bristol               | Portsmouth                             |
| Belfast (Dixon & Co.) | Reading                                |
| Cambridge             | Rugby                                  |
| Cardiff               | Southampton                            |
| Crewe                 | St. Helens                             |
| Derby                 | Southport                              |
| Doncaster             | Scottland Master Painters' Association |
| Folkestone            | Walsall                                |
| Hull                  | Wolverhampton                          |
| Kidderminster         | Warrington                             |
| Lancaster             | Wigan                                  |
| Leeds                 | Weston-super-Mare                      |
| Liverpool             |                                        |

As decided upon at the last half-yearly meeting, the half-yearly statements of hours worked, state of trade and supply of labour in the principal towns have been issued as follows:—One copy to each of the Council and six copies to each of the local associations, which show that though the building trade generally is still depressed, there is a slight improvement in one or two districts, and the supply of labour is abundant everywhere.

In Leeds the operative joiners and carpenters gave notice for an increase from 7½d. to 8d. per hour, and to reduce the working hours from 50 to



491 per week. The employers offered to give the advance of wages of 3d. per hour from the 1st July, 1888, and to keep the hours the same as at present worked, but this was refused by the operatives, and the employers withdrew the offer. On the 1st of the present month the operatives struck work in five of the leading shops, but as there was no bulk of work going on in the town the employers decided to withstand the demand. The Leeds members therefore ask the members of Associations in other towns not to take on any joiners, and employ as few as possible during the pending dispute.

During the present session the Government have introduced a new Employers' Liability Bill, framed entirely upon the report of the Parliamentary Committee which sat last session. A joint Parliamentary Committee of this Association, the Institute of Builders, and the London Association, have had frequent meetings and prepared an elaborate statement of Amendments. These were laid before Mr. Matthews, the Home Secretary, on the 20th of April last. At this interview the deputation dwelt upon the injustice of many of the clauses of the proposed Bill, both to employers and employed, and urged Mr. Matthews to modify them. The Home Secretary gave the deputation a very patient hearing, and very courteously promised to consider the amendments. Since this interview the Chairman of the Parliamentary Committee has had frequent interviews with many M.P.'s.

This Bill has now been submitted to the Grand Committee on Law, and the Solicitor, Mr. Maton, has been fortunate enough to obtain the assistance of Mr. Staveley Hill (M.P. for Nuneaton Division), who has placed the whole of the amendments upon the agenda paper, and has given them his support; but your Committee regret to find that the Bill, as amended, and the draft of which is now before the House, is altered to such an extent as to render it very much more harsh than it was when presented to the Grand Committee.

The one clause which will bear very hardly on the building trade, and particularly in the provinces, is No. 9, which defines the compensation to be paid. The minimum sum to be paid is now to be 250*l.*, or three years' average wages of workmen in the same grade whichever is larger. In the Bill, as presented to the Grand Committee, it was 150*l.*

In Clause No. 14, a new sub-clause is introduced to define the expression "superintendence," but it leaves the matter pretty much as it was.

The Parliamentary Committee are much afraid that little is to be hoped for in the way of modification of the great hardships which this Bill will entail upon the building trade; but, at the same time, it is satisfactory to know that the trade unionists have not been able to induce the Grand Committee to make the Bill more harsh than at present drawn. Your Committee would point out the immense influence which the trade unionists seem to have in Parliament, and they would strongly urge the members of the National Association to interview the M.P.'s for their divisions, and, if possible, make them understand the aims and wishes of the employers.

The Iron Trades Employers' Association, the Agricultural Engineers' Association, the Cotton Spinners' Association, and other important organisations are using their influence to secure the same result.

As mentioned in the last half-yearly report, there has been no further action taken by the Trades' Union Congress on the eight-hour question. The Steam Engine and Boilers (Persons in Charge) Bill, which was brought into Parliament, has been withdrawn for this session.

The Bill as to the Rating of Machinery has been brought into the House by Sir W. H. Houldsworth and others, but during the present session nothing is likely to be done in the matter, but the question is about to be raised in another form by Sir W. Houldsworth's colleague, Mr. E. W. Tomlinson, of Preston, who has given notice of his intention to move in the House of Commons:—

'That the present state of the law relating to the rating of hereditaments containing machinery gives rise to great variations of practice on the part of valuers in different parts of the country, and is likely in the future to be the cause of much uncertainty and injustice; and that with a view of promoting uniformity and preventing excessive burdens being laid upon industries in which machinery is used, legislation is urgently required.'

The Council wish again to bring before the members of the local Associations the necessity of every employer of labour, whether sole or sub-contractor, covering their risk by insuring in the Builders' Accident Insurance (Limited), the cost of which is under 1*d.* in the pound of wages paid. The policies cover, not only the employers' own operatives, but workmen who may be hurt or killed through the negligence of the insureds' workmen at the same works. For 1*s.* per cent. additional premium the risk to the general public caused by the negligence of the insureds' workmen is covered.

These rates have been found by the Builders' Accident Insurance (Limited) to be sufficient, under ordinary circumstances, to cover the employers' risk under the present law, but when the new law comes into force they may possibly have to be amended.

The sub-committee appointed to meet the committee of the Royal Institute of British Architects upon the question of the Form of Contract have not yet been able to move in the matter.

The Council again urgently desire that members of the local Associations should do their utmost to keep up their Associations in a thorough state of efficiency, so as to meet any emergency that may arise.

The Treasurer submits his audited accounts for the past half-year.

It was resolved to hold the next meeting at Manchester.

In the evening the gentlemen attending the meeting were entertained at a banquet at the North-Western Hotel, by the President, Committee, and Members of the Liverpool Master Builders' Association; and on Thursday, the 26th, those gentlemen who could remain went with the members of the Liverpool Master Builders' Association for an excursion on the river, and after luncheon at the Eastham Hotel, through the courtesy of Mr. E. Leader Williams, the engineer, and Mr. Walker, the contractor, they were taken over the works of the Manchester Ship Canal, returning to Liverpool at 5 p.m.

#### BUILDERS' BENEVOLENT INSTITUTION.

The forty-first annual meeting of this Institution was held on Thursday, July 26, at Willis's Rooms, St. James's. Mr. H. H. Bartlett, President, occupied the chair, supported by Mr. George Plucknett, J.P., Mr. Thomas Stirling, and other gentlemen.

Major Bruton, the Secretary, read the annual report, which stated that the income had not been sufficient to maintain the charity, and it had been necessary to have recourse to the remainder of the Reserve Fund to meet the liabilities for the support of the pensioners. That fund was now entirely exhausted, and an urgent appeal was made for sufficient funds to carry on the Institution for the forthcoming year. Should that appeal not be liberally responded to, some of the funded property would have to be realised—a misfortune which well-wishers of the Institution would much regret. During the past year the Committee had only been able to recommend the election of two men, although there were several candidates, and three widows of pensioners had been placed on the pension list. The number of deaths of pensioners had been eight; the total number now on the funds being twenty-eight men and thirty-five women. To the President (Mr. H. H. Bartlett) the Committee offered their grateful thanks for the kind interest he had shown for the prosperity of the Institution, and it was with great satisfaction they were able to announce that Mr. J. Howard Colls would be the President for the ensuing year; and that the annual dinner would be held, with the consent of the Court of the Worshipful Company of Carpenters, at their Hall, in London-wall, on Thursday, November 29 next.

The report and accounts were adopted, on the motion of Mr. George Plucknett, seconded by Mr. Thos. Stirling.

Votes of thanks were passed to the President for the past year (Mr. H. H. Bartlett), to the Vice-Presidents, to the Trustees, and to the Treasurer (Mr. George Plucknett), who was again re-elected.

Votes of thanks were also accorded to the Committee, the retiring members of which were re-elected; and Messrs. W. Brass and G. Wall added to their number. A similar compliment was paid the Auditors (Messrs. Ward, Duffield, & Widdall).

The Chairman proposed as President for the ensuing year, Mr. J. Howard Colls, who, he believed, had the interests of the Institution at heart, and would do all he could to make his year of office a successful one.

The proposition was duly seconded and agreed to, and with a vote of thanks to the Chairman the proceedings terminated.

#### BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

A SPECIAL general meeting of the subscribers and donors of this Institution was held at the offices 21, New Bridge-street, E.C., on Tuesday, July 31, Mr. E. C. Roe (of Messrs. Geo. Trollope & Sons) in the chair, in the absence of the President.

The Secretary (Mr. H. J. Wheatley) having read the advertisement convening the meeting, the minutes of the last general meeting were read, confirming the election of Messrs. J. Howard Colls, Thomas F. Rider, and William Robert Freeman (John Mowlem & Co.) as Trustees of the Institution, in succession to the

late Mr. Benjamin Colls (who died some years since) and Messrs. Edward Conder and Arthur Cates, who have recently resigned. Three of the original Trustees, viz., Messrs. G. S. Pritchard, Charles Richardson, and W. O. Anderson (who were appointed at the foundation of the Institution in 1886) still retain office, and, together with the three gentlemen recently elected, make up the number of trustees, as required by the rules.

The election of a pensioner (Mrs. Louisa R. Styles) to the Widow's Pension then took place; by show of hands, the amount of the pension being £20 per annum. The election of Mrs. Styles makes up a total of seventeen pensioners now on the books of the institution.

At the conclusion of the business a vote of thanks was presented to the Chairman for presiding.

#### A CLAIM IN RESPECT OF "SHORT" QUANTITIES.

PRIESTLEY AND ANOTHER v. STONE.

This important case, as to which we published several letters in the early part of this year,\* has now been before the Court of Appeal (the Master of the Rolls, Lord Justice Lindley, and Lord Justice Bowen). We take the following report of the case from the *Times* of July 31st:—

This was an action by builders against a quantity surveyor. The Rev. Reginald Duke, who was about to build a Roman Catholic church at Chiswick, employed one Kelly as architect. Kelly prepared the plans and instructed the defendant, a quantity surveyor, to take out the quantities according to the plans. The defendant accordingly prepared a bill of quantities, but a number of copies lithographed and handed them to Kelly. Kelly thereupon applied for tenders for the building of the church, and the plaintiffs, among others, tendered. Another tender was accepted for a certain sum. The plaintiffs brought this action to recover damages for injury caused by the alleged negligence and breach of duty of the defendant as quantity surveyor in preparing an inaccurate bill of quantities. The plaintiffs based their claim upon the ground that the defendant, by preparing the bill of quantities, represented that the same was correct, and would be sufficient for the building of the church according to the plans, and that it was the duty of the defendant to use ordinary care and skill in the preparation of the bill of quantities, knowing that tenders would be made upon the faith thereof. The defendant, in his statement of defence, denied that he was negligent, and said that there was no privity of contract between him and the plaintiffs, and that he did not owe any duty to the plaintiffs. He also denied that there was any inaccuracy in the bill of quantities, and alleged that the plans were altered after the quantities had been prepared. At the trial before Mr. Justice Stephen, without a jury, the Judge gave judgment for the defendant. The plaintiffs appealed.

Mr. Edwyn Jones appeared for the plaintiffs; Mr. Spence, for the defendant, was not called upon.

The Court dismissed the appeal.

The Master of the Rolls said that no such action as this had been known before the present case. The contract as to taking out the quantities was made between the architect and the quantity surveyor, and not with the builders. The surveyor was employed to take out the quantities for the architect, and handed them to him; and the surveyor had no control over the way in which the bill of quantities was used. The quantities might not be used at all, and they did not amount to a representation that they were true in fact. The architect could check them. If the bill of quantities were fraudulently made, the case might, perhaps, be different; but the case at the trial was not put upon this ground, and there was no evidence of any fraudulent or reckless statement. The quantity surveyor was not bound to conclude that the bill of quantities would be shown to anyone. The architect, in fact, might alter the quantities before sending them to the builders. This was an attempt to manufacture a new action which the Court would not sanction.

Lord Justice Lindley concurred. There was no privity of contract between the builders and the quantity surveyor. The custom relied upon as to delivery between builders and quantity surveyors was not proved; and, even if proved, the custom would probably be held to be unreasonable and bad within the decision in "*Bradburn v. Foley*" (3 C. P. D. 120). It was there put upon the ground that the defendant, in effect, made a negligent representation to the plaintiff. The real truth was that the delivery between the plaintiff and the defendant, and not by the builders, and there was no such representation. In his opinion there was no evidence of want of reasonable care.

Lord Justice Bowen also concurred. The action was without precedent. There were two fatal objections to the plaintiffs' case—there was no privity between the plaintiffs and the defendant, and the defendant owed no duty under the circumstances to the plaintiffs, as duty would only arise

\* See last vol. of *Builder*, pp. 60, 69, 70.



from privacy. It was said that the defendant made a misstatement which he knew would be passed on to other persons, and that he was liable on the authority of "Peek v. Derry" (37 Ch. D. 541). In applying "Peek v. Derry" it was always important to consider the meaning of the word "statement." If a man made a statement as upon his own belief, he either believed it or he did not. If he believed it, the statement was true; if he did not believe it, the statement must be fraudulent. The decision in "Peek v. Derry" could not apply to such a case as that. But it would be otherwise if a man made a statement outside his own belief. A quantity surveyor was, of course, bound to take reasonable care in taking out quantities. But he made no representation that he had taken such care. He only represented that those were his quantities,—a statement as to his belief. Therefore, assuming that there was evidence of negligence in the defendant, it was not enough to render him liable to the plaintiffs. Even assuming that a fraudulent misrepresentation, or one so reckless as to be fraudulent, would render the defendant liable to the plaintiffs, that case was not put at the trial, and there was no evidence of it.

# THE CHURCH OF ST. MARY-LE-STRAND.

SIR,—The drawings which you published last week of the steeple of St. Mary-le-Strand serve to draw attention to an unnecessary act of vandalism perpetrated in this interesting church a few years ago.

Messrs. Ketchlee & Hutchings have shown the vases in their proper places at the angles of the two upper stories. Alas, where are these vases!

When a scaffold was seen slowly rising round the tower a few months since, I, in common with many others, was in hopes that when it came down again it would reveal the vases replaced in their old positions, but we were doomed to disappointment; and, the scaffolding gone once more, the tower stands forth bare, and denuded of the ornaments which Gibbs placed there to serve a definite function, viz., to mark the set-back of the successive stories as they reduced in width towards the top, and to carry the eye upwards, just as in Gothic steeples a pinnacle or broach marks the junction of the octagon with the square and carries the eye from tower to spire.

Vases, as a rule, are doubtless not a very beautiful or commendable form of architectural ornament, but at least these served a purpose, and served it well, until, forthwith, one fine day, a small portion of one of them fell down, when, instead of repairing or replacing it,—a by no means difficult task,—they were all condemned, hewn down, and cast into the churchyard; and this latter was, I believe, a very difficult task, for they stoutly resisted the efforts of the iconoclasts, and in some cases only came down in pieces.

The fact that they are shown in your correspondent's drawing leads me to hope that they have not yet been broken up for concrete or otherwise disposed of, and if this is so why should they not once more be erected?

Let any one interested in the subject compare the steeple of this church with that of St. Martin-in-the-Fields if he wishes to see the effect with vases and without, and I think he will come to the conclusion that much of the unfinished and forlorn aspect which St. Mary's presents is due to their absence.

A PASSER-BY.

London, July 30th, 1888.

## SCHOOL-BOARD TENDERS.

SIR,—Referring to the letter, signed "Heating Engineer," on p. 68 in your issue of the 28th ult., I am not surprised at all at the contents. The Board advertised for tenders for heating the new schools, Amiens-street, Battersea, and they were desirous of obtaining a perfect system of heating. We, with others, received necessary plans and elevations, and tendered on our own lines, and adopted our own system, since the system was left open to each party tendering. The time and cost to us on plans, &c., was about 15*l.*, but still we sent in our estimate, guaranteeing the perfect working of the apparatus, and were surprised to find some time after that the Board had accepted a tender hundreds of pounds below ours, the material alone costing us more than the amount of the accepted tender. The Board in many cases for heating make out their own specifications, and there is not one respectable firm who could carry the work out in accordance therewith and guarantee success. If the Board wish a perfect system of heating and ventilating, they can have it by paying for it; but not when their mode of working is rule of thumb.

ONE OF THE FIRMS TENDERING.

SIR,—In reply to the letter of "Heating Engineer" in your last issue, no specification was provided, but the printed instructions stated that each scheme must comprise a detailed specification of the work and description of the system proposed, together with sketch plans complete, a guaranteed minimum temperature, and that "attention is

directed to the fact that the school is planned for future extension."

Over forty tenders were sent in, some of them lower than the accepted one.

We think that the discrepancy in the figures is due to the fact that the important questions of temperature and the provision for future extension were left to the discretion of the firms tendering.

We fully concur in the opinion expressed in the editorial note, and would suggest that more definite instructions be given for future tendering.

J. JONES & SONS.

P.S.—The amount of our tender, including the pupil teachers' school and provision for future extension, was 547*l.* We calculated for an average temperature of 60° Fah.

## DOWN-DRAUGHT IN DWELLING-HOUSE CHIMNEYS.

SIR,—May I, through the medium of your columns, ask for advice from some of your practical readers, under the following circumstances:

My house is situated on the summit of a very high hill in Derbyshire, and in a very exposed situation. On a rough night we experience great discomfort from the tremendous noise which the wind makes in the chimneys. My rooms are 10 ft. high, and from the ground-floor to the chimney-head would be about 33 ft. The flues measure 14 by 9 (internal dimensions), and upon each there is a "wind-guard" pot. There are register-grates in two of the bedrooms, but the closing of these has little or no effect on the roaring-noise, which seems to proceed from the chimney-breasts. I am very rarely troubled with smoke.

If any reader will give me the benefit of his experience in such a case, I shall be greatly obliged. Is there any means of closing a chimney at the top when not in use?

BOREAS.

\* \* The roaring of the wind in a chimney which, as "Boreas" observes, "seems to come from the chimney-breast," is not caused by the wind blowing down the chimney, but by the blast passing over it setting in motion the column of air in the chimney, on the same principle as that which causes the sound of an organ-pipe, or (which is a more precise analogy), the shrill whistle produced by blowing over the top of the tube of a key. Hence wind-guards, the object of which is to prevent the wind blowing down a chimney, may have little or no effect in checking a sound induced by the wind blowing over it. We cannot suggest any remedy except covering the top of the chimney when not in use. We do not know of any implement made for that purpose; no doubt terra-cotta closed pots, like extinguishers, could be made, but the putting them on and off would be a troublesome business.

## The Student's Column.

### ARTIFICIAL STONES.—Y.

Stones formed from Plaster of Paris.

THIS section deals with those expedients which have for their object the treatment of plaster of Paris casts, &c., so as to render them harder, more stone-like, and durable.

Plaster of Paris is obtained by the dehydration of natural gypsum at a temperature of from 110° C. to 120° C. If heated much above this the substance loses a good deal of its facility of combining with water, and consequently does not quickly harden.

A mode of obtaining dense translucent alabaster-like casts is to use plaster that has been prepared at 500° C. The combination with water takes several weeks, but with the above result.

The facility with which ordinary plaster casts may be obtained is largely discounted by their porosity and softness, which renders it practically impossible to preserve them clean and sound in exposed situations for any length of time.

Consequently a large number of proposals have been made for the superficial hardening of such casts. J. Penwarne, in 1809, was the first inventor who worked in this direction, and his process consisted in the immersion of the articles in a strong solution of alum for from fifteen to twenty minutes, subsequently suspending them over the bath until crystallisation began, when they were "basted" carefully with the solution from time to time. When well crystallised all over, the casts were rubbed smooth with sand-paper. The action of the alum here is chiefly mechanical, by closing the pores of the cast with crystals; but also apparently, to some extent, chemical, possibly by the formation of a double salt of sulphate of potash (alum is a double sul-

phate of potash and alumina) and sulphate of lime.

In the manufacture of the artificial marble termed "certainite," the plaster of Paris article is first well dried, to expel all uncombined water, and, after very careful cooling, immersed for twelve hours in an indurating bath, which may be composed of a variety of materials, such as salts of magnesium, carbonate or sulphate of potash or soda, sulphate of iron or copper, or, in fact, almost any saline or acid mixture that will not decompose the plaster, and is capable of imparting hardness to it. A favourite mixture is one of oxalic acid and alum or of oxalic acid and sulphate of iron, and when coloured marbles are desired, the colours should be added to the indurating bath. Another patent by the same Certaldo Marble Company relates to the treatment as described of the native gypsum cut to the desired shape.

Although the hardening of gypsum and plaster by alum is partly accounted for, as already mentioned, by the property which sulphate of lime possesses of forming double salts, the action of many other salts and acids does not seem quite so clear. It is probable, however, that the oxalic acid solution may be useful in precipitating oxalate of lime in the pores of the plaster by the decomposition of the sulphate dissolved by the water in contact with it. Bitartrate of potash, again, another salt that has been largely used, acts by the production of tartrate of calcium and sulphate of potash, which latter will unite with another portion of sulphate of lime forming the double salt.

When desiring the production of plaster casts possessing the maximum of hardness that untreated plaster will attain, the observation of Gay-Lussac should be borne in mind, viz., that the hardest natural gypsum produces plaster that yields the hardest casts.

Dr. Reissig's methods of hardening and preserving casts, which obtained a few years ago the prize offered by the Prussian Government, involve the soaking of the articles in a solution of barium hydrate (baryta water), or in a solution of silicate of potassium. In the first case the baryta decomposes a portion of the sulphate of lime, forming the more insoluble sulphate of barium, hydrate of lime being at the same time formed, which, absorbing carbonic acid gas from the atmosphere, ultimately becomes converted into carbonate. The silicate of potassium acts by the production of insoluble enamel-like silicate of lime, the sulphate of potash simultaneously formed uniting with sulphate of lime. In both processes the articles are finally treated with an alcoholic solution of soap.

Bruce Joy and Lewen's method, patented in 1884, is one for the production of imitation marble by immersing the cast (formed of a mixture of from 15 to 20 parts of plaster to 1 of zinc white) in refined linseed oil for six or seven days. It is then taken out and allowed to stand in a warm place for four or five days, and finally given a coat of flake white in refined linseed oil.

**The Liverpool Water Supply.**—At the meeting of the Liverpool Water Committee, on Monday last, Mr. Parry reported that the stock of water at Rivington had increased to 1,230 million gallons, and the Committee decided to increase the hours of supply in the city and Bootle to twelve hours per day, and in the suburban districts other than Bootle to eighteen hours per day. The alteration took effect on Wednesday.

**Rendering Walls Waterproof.**—The *Wiener Gewerbe Zeitung* advocates the following method for rendering brick walls impervious to moisture. It consists in giving the wall several consecutive coatings, first with soap and water, and secondly with water and alum, the proportion being 300 grammes of soft soap to a litre of water, and 200 grammes of alum to the same quantity. The walls must be very dry and clean, and the temperature of the air not below 8 deg. R. The soap-water is first applied boiling hot with a brush, and in twenty-four hours this coating is hard and dry. The alum-water is then applied, its temperature being from 16 to 17 deg. R. Twenty-four hours later the process is repeated, and afterwards twice or three times more. Should the walls be particularly exposed to wet, as for instance seawater, the process should be repeated a few times more.



## Books.

*First Elements of Experimental Geometry, applied to the measurement of Length, Breadth, Area, and Volume.* By PAUL BERT. Translated from the French, with additional questions and exercises based on the lessons. London, Paris, New York, and Melbourne: Cassell & Co.

**H**IS is a charming little book, written by its late accomplished author with the object of rendering geometry an attractive study to very young learners. In the preface the author says that having been often surprised to find how little taste the children in elementary schools have for geometry, he came to the conclusion that it was owing to the way in which the first notions of the science of mensuration was usually presented to a child, with catalogues of definitions in conventional language which conveys no idea to the childish mind. "A point has 'no dimensions,'—a philosopher will understand the definition, but not a child; 'no magnitude,' and to prove it, the master chalks on the blackboard a white spot as big as a sixpence. . . . Of what possible interest can it be to a child to learn to describe a circumference touching the three angles of a triangle? Or to divide a line? A time comes, no doubt, when all this may become interesting; but as he meets with these enunciations and demonstrations in the course of his lessons the pupil sees no use in them, and merely learns them mechanically by rote."

This criticism is, of course, equally true with regard to the commonly-accepted ways of teaching a great many things. Children are taught rules of which they do not see the bearing, and are told "they will see the use of it when they are older." The intelligent child wants to see the use of it *now*, and would pay attention and be interested if anyone would take the trouble to tell him. This is what Paul Bert has done, and done admirably, for geometry. You want to find out how far off that stick at the other side of the pond is from this tree here? And the author shows them how it may be done, not with mathematical, but with fair practical accuracy, by taking a base line on this side of the pond, and sighting along two sides of a piece of paper folded, after some experimental trials, into the right triangular shape; a kind of childish substitute for the theodolite. "This little figure, with three sides and three angles, is a picture or copy on paper of the big figure or triangle ABC drawn upon the ground." And he goes on to show that as we know the length of one side of the big triangle, and the same side in the little picture is 1-36th of the reality, and as by sighting along the two edges of the triangular piece of paper to the distant point and the near point we have got the angle and the shape of the triangle and the right proportion of the other two sides, the sides of the big triangle are in the same proportion to its base. Or does the child want the height of a tree? We show him how to get it with a right-angled isosceles triangle of card, the lower edge held level with the ground and the eye sighting the top of the tree along the hypotenuse, and then—

Make a mark on the ground just where your feet stood. Now take the yard measure and find the distance between the mark you have made and the tree. The height of the tree will be exactly equal to that distance added to your own height, or rather the height of your eye from the ground. It is done now, you see. The distance is 18 ft. 9 in., your height is 4 ft. 3 in.; 22 ft. 8 in. therefore is the height of the tree.\* Easy enough to do, is it not?"

Only the author does not, at this point, use any such hard words as "hypotenuse" or "isosceles." His lessons are illustrated by realistic little sketches. In this way of learning a child really sees that he is learning to find out things that may be of use, not merely playing with words and figures on a slate or a piece of paper. The ordinary definitions are gone into later on, when the pupil has learned to know something practically of what he is dealing with.

The book is one which ought to be most useful in teaching the elements of mensuration to the young, and indeed may be useful reading for many older people who have never had an idea on the subject, of whom there are not a

\* We presume that four inches is subtracted, as the distance of the eye below the top of the head.

few outside the ranks of the professions for which geometrical knowledge is more or less a necessity.

*Mathematical Drawing Instruments.* By Mr. WILLIAM FORD STANLEY. Sixth edition. Published by the Author at 5, Great Turnstile, Holborn, and by Messrs. E. & F. N. Spon, 125, Strand.

MR. STANLEY'S practical knowledge of the construction of mathematical instruments as a manufacturer has enabled him to produce a book of the highest value to those who have to use these instruments. In this book we find mathematical, drawing, and measuring instruments; their construction, uses, qualities, selection, preservation, and suggestions for improvements, fully described. A table of contents is provided at the beginning, and an index of instruments under their technical names is added at the end of the book. A natural prejudice in favour of the author's own improvements, the result of a life devoted to his work, and a desire to aim at perfection, has led him to give due prominence to his own instruments, but the work can be accepted as a useful guide to the student, independent of the maker he employs, though such names as those of Messrs. Elliott, Messrs. Adie, Messrs. Casella, Messrs. Troughton & Simms, and Messrs. John Davis & Son ought certainly not to be omitted in speaking of mathematical, drawing, and measuring instruments.

As stated by the author, our first ideas of mathematical instruments do not extend beyond a case of drawing-instruments; but we have only to refer our readers to our "Student's Columns" of last year to show how extensive the subject becomes when surveying instruments are added; and even when limited to drawing instruments, the author shows that there are many instruments very little known and not generally understood, that are worthy of attention. We are glad to see that the author, upon p. 3, emphasises the importance of purchasing good instruments. It is the greatest fallacy to suppose that *any* instruments will do for a beginner—a learner requires the very best instruments. When he has learnt the use of the instrument, and understands its adjustment thoroughly, an inferior article may serve his purpose, but certainly not for the purpose of studying his subject. Hence cheap second-hand instruments for a beginner should be avoided. The author's recommendation of fluid colours upon p. 311, and his condemnation of liquid Indian ink on p. 15, we entirely agree with. Indian ink requires to be rubbed fresh every day for nice work, and to be re-mixed every day when not washed out of the palette for ordinary work. Even then the old ink will not re-mix satisfactorily after the third day. The stick of Indian ink should be carefully wiped with a duster before the stick is laid down, otherwise next time it is used the ink will become gritty. Colours, on the contrary, when used in cakes as sold for mixing water-colour tints, should not be wiped, but placed upon their dry edge for the wet edge to dry. It is very wasteful to dry them with a cloth or duster. It is so often found expedient to mix more colour than is used, that the liquid colours recommended by Mr. Stanley for use in professional work are very economical.

Needle-points for drawing instruments are strongly recommended by the author, who has done much to improve the attachment of the needle to the instrument. Needle-points are excellent, except for "dividers," and "spring bow dividers" should never be used with needle-points. The same objection applies to needle-pointed dividers as to the road-pencil illustrated upon p. 19, namely, that it is difficult to maintain the points evenly apart. They are apt to shift, and, in the case of a road pencil, the points vary as the pencil wears down. The author's improved hair-spring connexion, shown on p. 30, and his inner nib to the dotting pen, on p. 21, are very good. The inner nib could also be applied to a large pen for ruling thick lines on a diagram, or for border-lines. Knife keys are now seldom used. The author's template keys for brick dimensions, on p. 32, and his calliper compasses, on p. 33, are worthy of commendation, the latter, with the addition of a vernier, would be especially useful. Faber's leads, which Mr. Stanley adapts so many of his instruments to fit, are, as stated, "regular in size, and sufficiently firm to bear clamping tightly."

The author's remarks upon double-jointed compasses are very proper. Neat work can

only be produced when the instrument used for drawing moves at right angles to the paper. The old-fashioned lengthening-bar to compasses is now seldom employed. For circles having a radius larger than can be struck with an ordinary compass, tubular compasses are found to work very steadily. They are complete in one piece, and do not require any loose parts. For circles with a larger radius than the limits of a tubular compass will set out, beam compasses are the best, those described by the author on page 61 being especially excellent. Several elliptic instruments, such as the "Oograph," described by the author on page 83, are very ingenious, but are not likely to be much in request. The remarks upon page 88, chapter xli., relative to the application of the parabola to scientific work, might have been omitted. They are foreign to the subject of the book, and much more might be said to make their purpose clear.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

## 8,917, Cows for Chimneys. T. S. Truss.

According to this invention, the force or action of the external air is employed to eject the smoke or air from the chimney. The injectors are also constructed so that the external air from the injectors passes over the flues on or over which the injectors are fixed. An elaborate specification describes the method of construction of the injector and the injector; the principle is, however, that of receiving and ejecting chambers with curved or bent-mouthed inlets and outlets.

## 11,508, Opening and Closing Fanlights, &amp;c. R. E. Harrison.

A vertical screw is by this invention carried by a fixed bracket and is in a manner that will put it in lower end, which is operated by a cord running over guide pulleys carried by lugs attached to the same bracket. The opener can be used either vertically or horizontally, and two shafts, spigots, or frames may be moved simultaneously in the same direction from the same motion by attaching two links to the screw nut.

## 3,001, Securing Door-Handles. W. Johnson.

This invention consists in fitting the knob to the spindle by a longitudinal dovetail connexion, so as to ensure a permanently tight fit of the spindle in the socket of the handle, and prevent play of the handle in any direction. A dovetailed tenon in the socket of the handle fits in a longitudinal dovetailed groove in the spindle (or vice versa) in combination with a cross-pin, set screw, or other means of preventing longitudinal motion of the knob on the spindle. The latch follower is also affixed by similar means.

## 7,354, Construction of Iron Buildings. L. S. Bunting.

This invention relates to fire-proof buildings composed chiefly of iron, and the objects are: (1) The construction of an iron building in a manner that will practically obviate any expansion and contraction during extremes of heat and cold; (2) A novel construction and arrangement of the main structure and of the stairs and elevator shafts, whereby there is attained the necessary strength and stability together with compactness, and the utilisation of the space to the best advantage; and (3) An improved plan of floors and means of bracing the iron beams in fire-proof floors in such structure. Details with this end in view are shown in several sheets of drawings accompanying the specification.

## 7,751, Improved Window-sill. H. Breuer and Others.

The sill which is the subject of this patent is made in metal, and is designed to be strong and durable, and when set in place to present a neat finish, and to effectually exclude rain, dust, or snow from the building. It is formed with a sloping ledge or plate, and an ornamental or moulded front pendant portion, which projects below the plate in the front of the building.

## 7,774, Stays for Casements, Fanlights, and the like. J. G. Dunn.

The improvements which are the subject of this patent consist in providing an arm attached at one end to a stationary part and at the other end to a moving part, with a centre joint consisting of enlarged discs, having teeth or projections thereon, which lock into each other. It is operated by a spring or screw or similar mechanism.

## 7,792, Sliding Doors. A. H. Ford.

The sliding doors are hinged or otherwise attached to a sliding jamb, and the invention is intended to be used principally in the manufacture of wardrobe doors, the object being to enable such doors as are lined with looking-glass to be so arranged that a front, side, and partial back view of the person to be seen.

## NEW APPLICATIONS FOR PATENTS.

July 29.—10,501, B. Jones, Tipping Cart, &c.—10,514, T. Neal & W. Moyle, Securing Edge Tools to their Handles.—10,515, J. Auth, Window-Glass Setting.—10,525, A. Bonit, Water and Fire Proof Floors, Ceilings, Roofs, &c.—10,527, A. Bonit, Machines for Lifting and Delivering Bricks, &c.—10,538, F. Geuth, Water Closets.

July 21.—10,544, F. Wieser, Flushing Tanks or Cisterns.—10,550, J. T. Haines, Safety Locking Gear for Actuating Fanlights.—10,563, F. Rorer, Electric Bell.—10,580, W. Thompson, Hinges.—10,586, A. McLean, Blocks or Slabs for Faving, &c.

July 23.—10,614, J. Howorth, Self-acting Popper-Ventilators.—July 24.—10,662 and 10,663, A. Tite, Burglar Alarms.—10,668, G. Herdman, Asphalt for Pavements, Buildings, &c.—10,670, J. Wright, Self-locking Window-sash Fastener.—10,706, G. Evans, Construction of Window-frames and Hanging the Sashes.



July 25.—10,755, T. Normanton, Inlet and Outlet Ventilators.—10,757, F. Wendling, Paint for Stone, Plaster, &c.—10,770, H. Hind, Door Fastener.  
 July 28.—10,801, G. Garrett, Sanitary Traps, &c.—10,805, T. Normanton and S. Major, Inlet Ventilators, &c.—10,824, C. Tockington, Preventing the Shaking of Windows.—10,842, W. Davies, Flushing Apparatus.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

6,510, S. Smith, Moulding Machines.—7,618, W. Ross, Bricks.—8,963, W. Sayer, Apparatus for Making Bricks, Tiles, &c.—9,054, W. Peyton, Chimney Head or Pot.—9,243, F. Hodges, Mitreing Mouldings, &c.—9,388, A. Hamden, Sewer and other Pipe Joints.—9,591, E. Thorp, Wind and Water Bars for Meeting Rails and Sliding Sashes.—9,594, L. Pary's Raising and Lowering Sashes.—9,644, S. Bagg, Dust and Draught Preventer for Doors.—9,645, A. Taylor, Boxes and Moulds for Pressing Bricks.—9,760, R. Pym, Fasteners for Doors.—9,761, J. Palmer, Elastic Wall Decoration Composition.—9,876, T. Clarke and C. Crapp, Preventing Cellars, Rooms, &c. from being Flooded from Drains or Sewers.—10,099, H. Hart, Brick for Building Purposes.—10,100, G. Dixon and W. Freeman, Window Fastenings.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

11,635, H. Joel, Pneumatic Bells and Signals.—12,362, P. Barrett, Counter-balancing Window-sashes.—12,917, M. Clarke, Fireproof Curtains for Theatres, &c.—12,972, M. Blanchard, Bricks for Walls, &c.—16,769, R. Melhuish, Joiner's Parallel Vice.—16,927, T. Ford, Hydraulic Lifts.—7,840, E. Rowe and J. Smith, Door Fastening Indicator.—7,940, G. Dolliner, Opening Windows Outside and Inside of the Room.—8,245, G. Anslow, Door Locks and Latches.—8,408, H. Lott, Metallic Roofing Plates or Shingles.—8,897, H. & H. House, Controlling the Movement of Doors, &c.—9,036, G. Carlson, Grinding Machine for Timber Frame Saws, &c.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

JULY 19.

By HUMBERT, SON, &amp; FLINT.

Staffordshire, The Laphay Hall Estate—Laphay Wood Farm, 218a. 3r. 1p., freehold ..... £4,325  
 Leicestershire, land and water meadows, 62a. 2r. 27p., freehold ..... 1,300  
 Numerous enclosures of land, 200a. 1r. 35p., freehold ..... 5,050  
 Rent-charges amounting to £147. 13s. 6d. .... 2,700

JULY 23.

By FULLER, MOORE, &amp; FULLER.

Banstead Common—The Residence, Mogador, a cottage, and about 14 acres, freehold ..... 810

By BROWN, ROBERTS, &amp; CO.

West Croydon Ground-rents of £100, reversion in 93 years ..... 2,540  
 Regent's-square—Ground-rents of £95, term 17 years ..... 805

By RYMONDS &amp; ELSON.

Bethnal Green—50 and 62, Quaker-street, 37 years, ground-rent £8. 8s. .... 4,200  
 Cheapside, Feather's-court—Freehold, area 1,600 ft. 420

By R. THORNGOOD.

Ware, Herts.—The Grange, with grounds, freehold ..... 1,510

By BENINGFIELD &amp; TIDY.

Broxborough—Wormley House, freehold ..... 600

By NEWSON &amp; HARDING.

New Southgate—6, Millbrook Villas, freehold ..... 250

By ROBERTSON &amp; BIRCHALL.

Bridport, near—Coombe Farm, and 530a. 3r. 15p., freehold ..... 11,650

By E. WOOD.

Battersea—232, York-road, 33 years, ground-rent £8 Wandsworth—16, Sangora-road, 93 years, ground-rent £28. 8s. .... 460

Camberwell—15, Baldwin's-crescent, 79 years, ground-rent £10 ..... 530

Bowes Park—1 to 3, Carlton-villas; and 15 to 31 and 41, Queen's-road, 93 years, ground-rent £400 ..... 1,900

Upper Clapton—21 and 23, Laver-road, 91 years, ground-rent £10 ..... 350

Woodford, Chelmsford-road—Woodbine Villa, freehold ..... 380

Egham—Stanley-cottages, freehold ..... 620

By ROBSON &amp; PERLIN.

Crouch-hill—44, Shaftesbury-road, 79 years, ground-rent £7 ..... 830

JULY 24.

By A. WATSON.

Kensington—One-sixth share of Nos. 15 and 22, Holland-street; 5, Duke's-lane; 9 and 10, New-lane-street; and 1 and 2, Baxendale-cottages, freehold ..... 1,020

By C. D. FIELD &amp; SONS.

Peckham—5, Lindo-street, 76 years, ground-rent £4 Kingsland—4 and 6, High-street, freehold ..... 4,040

Beachwood-street—Freehold stabling, &c. .... 1,510

By BEAN, BURNETT, &amp; CO.

Kensington—Ground-rent of £70, reversion in 83 years ..... 1,600

By FRASER, PRICE, &amp; FRASER.

Shepherd's Bush—60, Godolphin-road, 86 years, ground-rent £7 ..... 110

West India Dock-road—No. 67, freehold ..... 250

Kensington No. 49, High-street, freehold ..... 3,450

Fulham—34 to 38, Caroline-street, rental £70 34, 35, and 36, Victoria-road, 65 years, ground-rent £40 ..... 165

By DEBENHAM, TEWSON, &amp; CO.

Upton Park Two plots of freehold land ..... £1,430  
 Winchester, near—The residence, Greenhill, and 452a. 2r. 33p. .... 5,000  
 Wimbledon—The residence called Park House, and 6a. Or. 25p., freehold ..... 13,500

By S. &amp; G. KINGSTON.

Spalding—Freehold farm, and 81a. 3r. 34p. .... 3,770

JULY 25.

By H. DONALDSON.

Dalston—24, Regent's-row, 55 years, ground-rent £3 ..... 195

25, Allerton-road, 92 years, ground-rent £7 ..... 400

By A. SAVILE &amp; SON.

Miford—Great Newbury Estate of 170a. Or. 8p., freehold; and a rent-charge of £299. 18s. a year ..... 11,500

By ROGERS, CHAPMAN, &amp; THOMAS.

Battersea—15 and 15, Elcho-street, freehold ..... 520

Regent's Park—15, Dorchester-place, 43 years, ground-rent £14 ..... 650

By RUSWORTH &amp; STREVENS.

New Bond-street—No. 32, Corporation leasehold, 4 years, High-road—The Black Lion public-house, freehold ..... 4,950

Brasted, Kent—Two cottages and a plot of land, freehold ..... 8,920

Iver, Bucks—Two cottages and a plot of land at Love-greave ..... 820

By D. SMITH, SON, &amp; OAKLEY.

Liphook Station, near—Three cottages and 2a. 1r. 17p. .... 360

By ARBER, RUTTER, &amp; WAGHORN.

Lambeth—18, 20, 24, and 26, Broad-street, copyhold ..... 795

8, Broad-street, The Coach and Horse tavern, copyhold ..... 760

11, Prince-street, copyhold ..... 480

1 to 4, Gunned-court, copyhold ..... 1,000

21, Salamanca-court, copyhold ..... 300

6, Graby-buildings and 23, Salamanca-street, copyhold ground-rents of £28. 6s., reversion in 20 years, and 11 to 14, Little Salamanca-court, copyhold ..... 1,730

4 to 16 even, Salamanca-street and 1, 2, and 3, Salamanca-court ..... 840

4 to 10, Salamanca-court and 4, Little Lemon-court, freehold ..... 530

32 and 33, Albert Embankment, copyhold ..... 555

Albert Embankment—A plot of land, area 3,350 feet ..... 1,000

Copyhold ground-rent of £13, reversion in 67 years ..... 820

Copyhold ground-rent of £50, reversion in 67 years ..... 1,140

JULY 26.

By C. C. &amp; T. MOORE.

Bow-road—31 and 32, Merchant-street, freehold ..... 510

1, Mile End—14, 16, 18, and 20, Court's-road, 49 years, ground-rent £18 ..... 750

Commercial-road—3 and 11, Dean-street, 9 years, ground-rent £11 ..... 90

By A. YOUNG.

Bermadsey—153 to 163 odd, Ford-road, freehold ..... 2,580

Bromley-by-Bow—A plot of freehold land, 3,510 ft. 540

By BAKER &amp; SONS.

Chelsea, Broughton-road—Ground-rent of £13, reversion in 97 years ..... 299

64 to 74 even, Eulowood, freehold ..... 1,135

Victoria-road—Three plots of freehold land ..... 178

Upper Norwood, Alexandra-road—Lawnwood, 66 years, ground-rent £3 ..... 620

The residences, Mill and Mansors, 86 years, ground-rent £18 ..... 1,230

By G. B. HILLIARD &amp; SON.

Maldon, near—Red Lion's Farm, about 130 acres ..... 1,300

King's Farm, 38a. 2r. 32p., freehold ..... 300

Beacon Hill Farm, 104a. 1r. 12p., freehold ..... 275

By E. STEVENSON.

Horsleydown—10, Thomas-street, 18 years, ground-rent £12 ..... 125

50, Gainsford-street, 32 years, ground-rent £12 ..... 130

Camberwell—88 to 96 even, St. Mark's-road, freehold ..... 1,615

98, St. Mark's-road, freehold ..... 660

128 to 134 even, Farmer's-road, freehold ..... 1,220

137, 139, and 141, Thomas-street, freehold ..... 1,190

Old Kent-road—1, 3, 5, and 5, Stockwell-street, freehold ..... 300

By ARBER, RUTTER, &amp; WAGHORN.

Lambeth—Copyhold ground-rent, £20. 10s., reversion in 25 years ..... 600

78 to 88 even, Vauxhall-walk, copyhold ..... 1,170

1 to 20, Gloucester-street, copyhold ..... 5,350

Gloucester-street—A plot of land, area 1,400 ft. 44, Vauxhall-walk, copyhold ..... 605

1 and 2, Windsor-cottages, copyhold ..... 250

Woolwich—20, Church-street, freehold ..... 600

By FRASER, PRICE, &amp; FRASER.

Westbourne Park, Langwater-road—Ground-rents of £130, reversion in 75 years ..... 3,370

All Saints-road—Ground-rents of £110, reversion in 75 years ..... 2,800

Tavistock-crescent—Ground-rents of £85, reversion in 75 years ..... 3,980

St. Luke's-road—Ground-rents of £40, reversion in 75 years ..... 2,173

Finbury Park, Osborne-road—Ground-rents of £115. 14s., reversion in 84 years ..... 2,950

Marquis-road—Ground-rents of £15. 10s., reversion in 84 years ..... 395

Florence-road—Ground-rents of £28, reversion in 84 years ..... 710

Ground-rents of £28. 17s., reversion in 84 years ..... 725

Harrow-road—Ground-rents of £25. 16s., reversion in 79 years ..... 660

By JENKINS, SONS, &amp; BLISS.

Lordship Lane—35, Cathew-road, freehold ..... £240

By GLASIER &amp; SONS.

Pulborough, Sussex—Stall House Farm, 112a. 2r. 38p., freehold ..... £1,060  
 Slatter Farm, 370a. 2r. 20p., freehold ..... 3,300  
 Gatwick and Broadford farms, 293a. 3r. 19p., freehold ..... 2,900  
 Woodhill and Gobles farms, 300a. 2r. 22p., freehold ..... 3,100

By H. J. BLISS &amp; SONS.

Old Kent-road—23 & 25, Upcott-street, 73 years, ground-rent £9 ..... 325

Victoria Park—16, Cawley-road, 66 years, ground-rent £8 ..... 445

Shoreditch—21a, Kingsland-road, freehold ..... 610

Islington—10, Union-square, 39 years, ground-rent ..... 460

Victoria Park—9 to 14, Robinson-road, 66 years, ground-rent £24 ..... 2,250

Hackney—19, 20, & 21, Rutland-road, 64 years, ground-rent £12 ..... 890

6, Derby-road, 54 years, ground-rent £4 ..... 250

Shoreditch—17 to 25 odd, Weymouth-terrace, 25 years, ground-rent £17. 10s. .... 1,010

8 to 13, Fleming-street, 7 years, ground-rent £21 ..... 380

Dalston—75, 77, & 79, Marlborough-road, 57 years, ground-rent £12. 10s. .... 810

Hoxton, 16, 18, & 20, Norris-street, 31 years, ground-rent £12. 10s. .... 300

Bethnal Green—41 to 47 odd, James-street, and a plot of land, freehold ..... 800

James-street—The Fountain public-house, freehold ..... 1,650

163 to 177 odd, West-street, freehold ..... 940

179 to 193 odd, West-street, freehold ..... 835

Limehouse—34, St. Ann's-road, freehold ..... 600

Spitalfields—40 & 42, White Lion-street, 21 years, ground-rent £24 ..... 60

33 & 35, Hanbury-street, 21 years, ground-rent £55 ..... 195

27, 29, & 31, Quaker-street and 1 to 4, New Square, 6 years, ground-rent £40 ..... 110

39 & 41, Quaker-street, 6 years, ground-rent £30 ..... 25

JULY 27.

By W. B. HALLITT.

Kingsland—A profit rental of £51, term 34 years ... 650

1, Ardleigh-road, 35 years, ground-rent £4 ..... 340

Sydenham—2, 4, 6, and 8, Kiver-road North, 25 years, ground-rent £24 ..... 1,150

By FLOOD &amp; SONS.

Harrow-road—67, Clarendon-street, 64 years, ground-rent £5 ..... 345

10, Clarendon-street, 75 years, ground-rent £8 ..... 250

By TURNER, RUDON, &amp; TURNER.

Lingfield—An enclosure of freehold land, 4a. 3r. 15p. .... 400

By HENRY &amp; LATCHFORD.

Clapham—33 to 39 odd, Lavender-terrace, 46 years, ground-rent £11. 15s. .... 475

By GIBBS &amp; SON.

St. James's—2, Bennett-street, freehold ..... 3,800

By R. KNID.

Tottenham Court-road—An improved rental, £105, term 40 years ..... 2,000

5, Tudor-place, freehold ..... 445

By DRIVER &amp; CO.

Bridgnorth—The Hay Farm, and Eardington Iron Works, 307a. 2r. 20p., freehold ..... 8,000

By BALL, NORRIS, &amp; HADLEY.

Peckham—98, 100, and 102, Pomeroey-street, 53 years, ground-rent £7 ..... 510

Brixton—50, Gresham-road, 76 years, ground-rent £1 ..... 760

By E. SMITH &amp; CO.

St. John's Wood—74, Hamilton-terrace, 45 years, ground-rent £18 ..... 1,600

By ARBER, RUTTER, &amp; WAGHORN.

Lambeth—32 to 42 even, Vauxhall-walk, copyhold ..... 3,120

24 to 30 even, Vauxhall-walk, copyhold ..... 1,385

Copyhold ground-rent of £6, reversion in 33 years ..... 150

Copyhold ground-rent of £10. 10s., reversion in 17 years ..... 750

4 to 9, High-street, copyhold ..... 890

130 and 141, Lambeth-road, copyhold ..... 890

20, Saville-place and 3, Berkeley-street, copyhold ..... 510

29 to 32, and 34, Berkeley-street, copyhold ..... 2,330

16, 20, and 21, Berkeley-street, copyhold ..... 935

5, Mill-street, copyhold ..... 930

11 and 12, Fruit-street and 7, Mill-street, copyhold ..... 610

68 to 74 even, Lambeth-walk, copyhold ..... 1,380

## MEETINGS.

TUESDAY, AUGUST 7.

Royal Archaeological Institute.—Opening of the Leamington Congress. Visit to Stratford-on-Avon.  
 Glasgow Architectural Association.—Mr. A. N. Prentice on "Early English Architecture."

WEDNESDAY, AUGUST 8.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Banbury, Broughton Castle, &c.

THURSDAY, AUGUST 9.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Warwick, &c.

FRIDAY, AUGUST 10.

Royal Archaeological Institute.—Leamington Congress (continued). Visits to Kenilworth Castle and Stoneleigh Abbey.

SATURDAY, AUGUST 11.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Coventry.



### Miscellaneous.

**The Registration of Plumbers.** A public meeting was held in the Free Library at Liverpool, last week, "to consider the registration of qualified plumbers as a measure for securing higher efficiency of plumbers' craftsmanship in the interests of public health." The chairman of the Health Committee presided, supported by the medical officers and sanitary authorities of the chief towns in the district. Dr. J. S. Taylor, Medical Officer of Health, Liverpool, proposed that a district council should be appointed for Liverpool, Birkenhead, West Lancashire, Cheshire, Denbigh, Flint, Carnarvon, and Anglesey, to act in union with the Plumbers' Company.—Mr. Duckworth, President of the Liverpool School of Science, seconded the resolution, which was carried, and a district council, composed of representatives of the public and the plumbers of the locality, was appointed.—At the City and Guilds Institute, Finsbury, on Monday, an examination was held, under the auspices of the Worshipful Company of Plumbers, for certificates of registration. The practical examination included various branches of lead work, and the theoretical questions relating to the several subjects of plumbers' materials, house fittings, and sanitation. Plumbers attended from Fordingbridge, Exeter, Tunbridge Wells, Ryde, Bicester, Margate, and various districts of London. The examiners were Mr. Chas. Hudson, Assistant Chairman of the Registration Committee, and Messrs. Ashdown, Davis, Lobb, Lyne, Millis, Smeaton, Taylor, and Webb. Rather less than 50 per cent. of those attending passed the full examination.

**Fire Rescue Exhibition.**—On Monday the Lord Mayor opened an exhibition of articles and appliances relating to the rescue of life from fire and cognate dangers, at the Portman Rooms, Baker-street. The proceedings were opened by Dr. Danford Thomas, who explained the aim of the exhibition to be the instruction of the public, both as to preventive and remedial measures. The apathy that existed upon the subject was appalling, and he hoped one result of the exhibition would be to induce the heads of business firms and private persons to provide themselves with effective means of escape. The exhibition, which is both extensive and interesting, contains a large variety of fire-escapes suitable for private houses and public buildings; fire extinguishers, and preparations designed to render dress materials, curtains, &c., non-inflammable. Interesting trials are conducted daily while the exhibition lasts, with the view of showing how rapidly and easily escape from a burning building may be effected by some of the appliances exhibited. The exhibition remains open until Saturday, and any profits resulting from it will be given to the Royal Humane Society. Of a few of the more notable of the exhibits we propose to speak on a future occasion.

**Excursion of Messrs. John Mowlem & Co.'s Staff.**—On Saturday last the staff of Messrs. John Mowlem & Co. had their summer excursion. The party, consisting of the managers, foremen, and clerks, and numbering about 170, left Waterloo at 7 a.m. by special train for Bournemouth, whence the party proceeded by steamer for a sea trip, and then to Swanage, where Mr. Burt, senior, resides. Dinner was served at Durlston Castle, Durlston Head, Swanage, all the members of the firm (as also the lately-retired partners, Mr. Joseph Freeman and Mr. George Burt, and other friends) being present. Mr. Burt gave the toast of "The Queen," the only other toast drunk being "The Firm of John Mowlem & Co.," which was proposed by Mr. Robertson, of the Outside Staff, and very cordially received. After dinner the company dispersed to examine the objects of interest in the neighbourhood, meeting again later in the grounds of Mr. Burt's house, where tea was partaken of. The party returned by steamer and train, and reached Waterloo at 11 p.m., the weather having continued fine throughout the day.

**The Great Northern Central Hospital.**—In reference to this hospital, of which we gave a description last week (p. 65, *ante*), we are asked to mention that Boyle's latest improved patent self-acting air-pump ventilators are used on certain portions of the building. Mr. J. E. Ellison, of Leeds, writes to say that the gratings between the beds in the wards are fitted on the inside with his patent "Radiator ventilators." Messrs. Gynan & Son, of Carburton-street, supplied the whole of the blinds.

**The English Iron Trade.**—The improvement in the English iron trade continues to make steady progress. The pig-iron market is especially strong. Scotch warrants have been active this week, and are steadily advancing; Scotch makers' irons having also risen from 6d. to 1s. a ton. Middlesbrough pig has likewise made another move upwards, of 6d. per ton, or 1s. during a fortnight, and is now quoted 38s. cash, at which price makers decline selling. The Lancashire pig-iron market is stronger, and there has been an advance of between 1s. and 1s. 6d. a ton in the lower-priced brands. Bessemer iron has gone up from 9d. to 1s. per ton, and is now quoted at 43s. 6d. to 44s. for mixed numbers. Besides a steady demand, the gradual decrease in stocks helps to strengthen the pig-iron market. Manufactured iron is enjoying a good inquiry, under which prices have considerably stiffened. The same can be said of tinplates, of which makers hold large orders. Steelmakers are much pressed for delivery of shipbuilding material, and they are also busy on rails; but there has been no upward movements in values. Shipbuilders are well off for work, and their prospects are very fair. In the engineering trades the improvement recently reported is well maintained. —*Iron.*

**The Drainage of Swinton.**—The *Manchester Guardian* reports that Mr. Arnold Taylor, of the Local Government Board Office, opened an inquiry a few days ago at the offices of the Swinton and Pendlebury Local Board into that Board's application for sanction to borrow £8,128 for works of sewage and sewage disposal. The Clerk (Mr. Hewetson) explained that the Swinton and Pendlebury Local Board, being threatened with litigation in respect of the pollution of Black Brook and the River Irwell, had, with the advice and assistance of Mr. Vawser, C.E., adopted a scheme for the treatment of sewage, which the Board proposed to carry out on land at the Carrs, Pendlebury, now belonging to Messrs. A. Knowles & Sons. Mr. Mountain and Mr. Vawser explained the nature of the proposed works, and Mr. Arnold Taylor, having heard further evidence for and against the scheme, afterwards visited the site in question.

**The New Crematorium in Milan.**—Referring to the new crematorium just opened in Milan, the *Secolo* states that it is situated at the end of Campo Santo, just outside the walls of the city. The "Temple," as it is called, is in Doric-Greek style, and built of stone, with an open facade supported by columns. Behind it rises a tower, which seems connected with it, but it is in reality a huge chimney. The building is divided into rooms for various purposes, as the religious ceremonies, the depositing of urns containing the ashes of the cremated, &c. There is one furnace for the consumption of bodies infected with contagious diseases, and one for ordinary cases. Neither the bodies nor the ashes are seen by those present. The process is the most perfect known, and occupies two hours. New crematoria will also be opened this year in Turin, San Remo, Verona, Bologna, and Padua.

**Mr. John Bellamy's Employees at Broxbourne.**—Last week the employees of Mr. John Bellamy, tank and boiler-maker, of Byng-street, Millwall, had a most enjoyable outing to Broxbourne, to celebrate the twenty-fifth anniversary of the foundation of the firm. The excursionists made the journey in brakes. Mr. Bellamy, with his clerks and heads of departments, being of the number. They were lucky enough to have good weather, which is saying a great deal just now. On arriving at the Crown Hotel the party was entertained by Mr. Bellamy to dinner, Messrs. Parnell and Scriven occupying the vice-chairs, and the host being supported right and left by Messrs. Hooft, Dyson, Howlett, Piper, Davis, Clague, and Campbell.

**Sales of Building Sites at Dovercourt.**—Last week Mr. F. C. Kettle, of Moorgate-street, submitted for sale at Dovercourt, near Harwich, several plots of building land, being a portion of an estate belonging to the Chelmsford Land Company. The company had engaged one of the Great Eastern Railway Company's trains to take intending purchasers and others to the estate, and about 200 persons were present. The estate is situated in an eligible locality, with a commanding sea-view. Out of eighty-two lots which were submitted, upwards of fifty were sold, the average prices obtained being from 50l. to 60l. for each lot, the sale realising about 3,600l.

**Large Sale of Building Land at Frinton.**—On Monday last Mr. Richard J. Collier conducted in extensive sale of freehold building land at Frinton, a new seaside resort on the East coast, situated between Clacton-on-Sea and Walton-on-the-Naze, at which an estate of upwards of 100 acres in extent has been purchased by the Marine and General Land, Building, and Investment Company, who have laid out the estate for building upon several new roads having been formed, together with an esplanade facing the sea, upwards of a mile and a half in length, in front of which is a turfed promenade running the entire length of the esplanade. The estate is situated on high ground, with a commanding view of the German Ocean. Already several high-class houses have been erected along the esplanade frontage, and also facing the several new roads which have been formed, whilst building is now going forward on different parts of the estate. The Tending Hundred Water Company, whose district includes Walton-on-the-Naze, Clacton, and several surrounding parishes, have nearly completed the laying down of water-mains in all the newly-formed roads; and amongst other works to be carried out is an ornamental sea-wall, running the full length of the cliffs and esplanade. The lots offered were ninety-seven in number, including several shop plots and a large hotel plot facing the sea, having a frontage of more than 200 ft. The sale took place at the Queen's Hotel, which has recently been erected on the estate. The plots submitted were all unusually large ones, varying in their frontages from 30 ft. to 120 ft., and in depth from 100 ft. to 160 ft. On the sale commencing the biddings became close and spirited, and a large proportion of the lots offered were sold at prices varying from 30l. for the smaller lots, to 60l., 80l., and 100l. for those having a larger area. Three lots on the East Cliff, facing the sea, and situated on that part of the estate described as the Crescent, having frontages of 100 ft., and depths of 170 ft., were sold for 125l. each. An angular plot close to the sea, containing 3½ acres, was sold for 395l. For the large hotel plot facing the West Cliff, having frontages of 200 ft., 410l. was offered, but being below the average, was bought in at 450l. The total proceeds of the day's sale amounted to 3,400l.

**Unseasonable Weather and the Public Health.**—The popular conviction that seasonable weather—that is, the prevalence of Arctic cold in winter and of Tropical heat in summer—is conducive to health, will probably long survive the most convincing statistical evidence of the fallacy on which it is based. It may be useful, however, to call attention to the apparent effect of the recent long-continued spell of unseasonable summer weather upon the public health, judged by the death-rate. During the six weeks ending on Saturday [July 21], the mean temperature at the Royal Observatory, Greenwich, was almost continuously below the average. If we except five days in June (the 11th, 12th, 24th, 25th, and 26th), a deficiency in the mean temperature was recorded on each of the forty-two days in this period. The average daily deficiency on these thirty-seven days of low temperature was no less than 5.2 deg. F., the coldest days being the 11th and 12th of July, when the deficiency was no less than 14.0 deg. and 13.4 deg. The frequency and amount of rainfall during this period were almost as remarkable as the low temperature. Rain was measured on twenty-seven of the forty-two days in this period of six weeks to the aggregate amount of 6.13 in., being almost identical with the amount measured this year previously to the six weeks under notice. Let us now consider what has been the death-rate in our largest English towns reported by the Registrar-General during this unseasonable, and probably unprecedentedly cold and wet period. In the twenty-eight large English towns dealt with in the Registrar-General's weekly return the annual death-rate in the six weeks now under notice was equal to 15.7 per 1,000 of the estimated population,—a rate very far below any previously recorded during this period; the mean rate in the corresponding period of the six preceding years 1882-87 was 19.3, and exceeded by 3.6 the rate in the six weeks ending July 21. From the above-mentioned facts, it is, at any rate, patent that the recent cold, wet, and sunless weather cannot have unfavourably affected the public health, even if we hesitate to affirm that the low death-rate has been due to the prevalence of such exceptionally unseasonable weather.—*Lancet.*





LONDON.—For the erection of a school to provide accommodation for 800 children, and also a pupil teachers' school, on the site in Laverden-hill (West Lambeth B.), for the School Board for London. Mr. T. J. Bailey, architect.

|                |             |
|----------------|-------------|
| Kirk Bros.     | £20,335 0 0 |
| S. Hart        | 19,700 0 0  |
| H. L. Holloway | 19,552 0 0  |
| C. Wall        | 19,212 0 0  |
| S. J. Jerrard  | 17,935 0 0  |
| Stimpson & Co. | 17,680 0 0  |
| W. Johnson     | 17,493 0 0  |
| J. Holloway*   | 17,000 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a school to provide accommodation for 1,000 children on the site in Langford-road (Chelsea Q.), for the School Board for London. Mr. T. J. Bailey, architect.

|                |             |
|----------------|-------------|
| H. L. Holloway | £13,664 0 0 |
| S. Hart        | 13,539 0 0  |
| S. J. Jerrard  | 13,277 0 0  |
| W. Johnson     | 13,074 0 0  |
| Stimpson & Co. | 12,890 0 0  |
| J. Holloway    | 12,656 0 0  |
| C. Wall*       | 12,578 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For erecting Divisional Offices, a Deaf and Dumb Centre, a Cookery Centre, and schoolkeeper's house, on a site in Morning-lane (Hackney J.), for the School Board for London. Mr. T. J. Bailey, architect.

|                  |            |
|------------------|------------|
| Atterton & Latta | £3,295 0 0 |
| Norris & Luke    | 3,123 0 0  |
| C. Deering & Son | 3,020 0 0  |
| H. L. Holloway   | 3,060 0 0  |
| Stimpson & Co.   | 2,970 0 0  |
| C. Cox           | 2,894 0 0  |
| W. Johnson       | 2,894 0 0  |
| W. M. Dabbs*     | 2,795 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For the erection of a Cookery Centre on the Princess-road site (Marylebone Q.), for the School Board for London. Mr. T. J. Bailey, architect.

|              |          |
|--------------|----------|
| J. Lindfield | £748 0 0 |
| Wall Bros.   | 550 0 0  |

\* Recommended by the Works Committee for acceptance.

LONDON.—For certain works at Hanbury-street, Spitalfields, for Messrs. Tugby, Jacobs & Co., Mr. R. W. Hobden, architect, 14, Devonshire-street, E.C.

|                       |          |
|-----------------------|----------|
| Allard                | £300 0 0 |
| Pury & Clarke         | 279 0 0  |
| George Luck, Mile End | 259 0 0  |
| Exton & Burton        | 237 0 0  |
| Jennings              | 225 0 0  |

LONDON.—For erecting a new warehouse, on section "F" at Free Trade Wharf, Broad-street, Ratcliff, Middlesex, for the Free Trade Wharf Company. Mr. Charles Dunch, architect, Quantities by Mr. James F. Wesley, 277, Romford-road, Forest gate.

|                       |            |
|-----------------------|------------|
| Patman & Fotheringham | £5,323 0 0 |
| Grover & Son          | 5,208 0 0  |
| Colls & Son           | 5,198 0 0  |
| B. E. Nightingale     | 5,180 0 0  |
| Mark Gentry           | 5,182 0 0  |
| Moviem & Co.          | 5,180 0 0  |
| Lawrence & Sons       | 4,990 0 0  |
| J. Morter             | 4,880 0 0  |
| Harris & Wardrop      | 4,853 0 0  |
| Ashby & Horner        | 4,850 0 0  |
| W. Shepherd           | 4,723 0 0  |
| J. & J. Greenwood     | 4,721 0 0  |

LONDON.—For sanitary and decorative work at No. 25, Blyth-rillas, West Kensington. Mr. H. Phelps Drew, architect, 95, Gloucester-road, S.W.

|                   |           |
|-------------------|-----------|
| Polden            | £471 10 0 |
| Nash              | 387 10 0  |
| Hewitt            | 347 10 0  |
| Norton (accepted) | 343 0 0   |

LONDON.—For repairs and alterations to 571 and 573, Commercial-road, E., for Mr. Boner. Mr. Joseph Harris, architect, Bow.

|                   |          |
|-------------------|----------|
| Pringle           | £494 0 0 |
| Chisn             | 491 0 0  |
| Lusk              | 440 0 0  |
| Cutmore & Co.     | 425 0 0  |
| Timson (accepted) | 375 0 0  |

LONDON.—For block of offices, Cloak-lane. Mr. T. Taylor Smith, architect.

Messrs. Stephens, Bastow & Co., Bristol (accepted at per schedule of prices).

LONDON.—For works at 113, Cheapside, E.C., for Messrs. Reeves & Son. Mr. C. R. Hancock, 47, Old Broad-street, E.C., architect.

|                  |          |
|------------------|----------|
| Quartermaster    | £252 0 0 |
| Langer & Parkham | 413 0 0  |
| J. Anley         | 439 0 0  |

LONDON.—For painting, decorating, carpentry, and electrical ball-fitting, at 46, Bramham-gardens, S.W.—Godfrey Giles & Co. (accepted). £235 0 0 [Lowest of three tenders.]

LONDON.—For rebuilding the Cook Tavern, Arthur-street East, E.C., for Mr. A. Smith. Mr. Fred. A. Ashken, architect, Stratford.

|                     |            |
|---------------------|------------|
| S. Smith (accepted) | £5,320 0 0 |
|---------------------|------------|

ROMFORD.—For erecting covered yard and stabling at the rear of the Woolpack Inn, Romford, Essex, for Messrs. Ind, Coope, & Co., Limited. Mr. John Hudson, architect, 80, Leaman-street, E.

|                                     |          |
|-------------------------------------|----------|
| J. Bentley, Waltham Abbey           | £280 0 0 |
| J. S. Hammond & Son, Romford        | 887 0 0  |
| W. Gladding, Whitechapel (accepted) | 754 0 0  |

TOTTENHAM.—For rebuilding three villa residences and stabling, West Green-road, Tottenham, N., for Mr. B. Sharp. Mr. J. E. Pinder, architect.

|                |            |
|----------------|------------|
| Colville & Son | £1,680 0 0 |
| Knight & Son   | 1,420 0 0  |
| Hicks          | 1,250 0 0  |
| Groves         | 1,105 0 0  |

TOTTENHAM.—For erecting villa residence at Tottenham. W. Harris, Melbourn, Cambs.\*

|                              |          |
|------------------------------|----------|
| W. Harris, Melbourn, Cambs.* | £760 0 0 |
|------------------------------|----------|

\* Accepted.

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# The Builder.

VOL. LV. No. 2375.

SATURDAY, AUGUST 11, 1888.

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### Kentish Brasses.



IN the work thus entitled\* Mr. Belcher has aimed, we believe, at giving a complete illustration of the monumental brasses in Kent, a county so rich in this class of memor-

ials. He has at all events produced a very large collection of the brasses of the county, illustrated in very good plates, all as far as possible dated, and all with scales appended—the latter a point not unfrequently forgotten; the brasses being in most cases photographed from full-sized rubbings, the necessity of a scale is not obtruded on the attention in the first instance, and is too often overlooked afterwards.

The only thing we should have desired differently arranged in the volume would have been that the examples should have been placed in at least a general chronological order, so as to bring before the reader at a glance the changes in style in regard to execution, costume, and character of the representation attempted, as time went on. We can see no reason why this should not have been done, as it is merely a question of the order of the plates, and it would certainly have been an improvement, and would have illustrated more directly, also, the author's own remarks, in the preface, as to the alteration in character in the later brasses. On this point, however, we cannot quite concur with all that is said. After mentioning the historic interest of brasses to the students of genealogy and heraldry and costume, also to the architect, "who will see in the beautiful canopies so often found the details and arrangements and characteristics of each successive style of his art" (the architect would hardly make a satisfactory study from the brasses, however, if he had not the buildings as well), Mr. Belcher observes:—"The artist has examples in the earliest of these engravings of the beauty and excellence of his work; and can trace, as they come nearer to our own time, their gradual deterioration; for so it is, that the earliest are the best, and the latest (for they come down to the seventeenth century) are the most tasteless and badly

executed." In a general way, it is true that the earlier brasses are finer in style and more monumental in feeling; but it is hardly fair to trace the inferior dignity of the later ones entirely to the fault of the artist. The fact is that, as the brass always represented the costume of the day, the later artists in these engraved monuments fell upon times when dress was much less dignified and picturesque than in the earlier days, and also much more "fussy" in line and detail, and therefore much less suitable for production in a form of representation which must deal chiefly with outline. Ruffs and laced dresses are doubtless much less suitable for delineation in a severe monumental style than a suit of armour or a "cote-hardie." But that is not the fault of the brass engraver, who had to do his best with the costume set before him. And the remark that the brasses were "real, or, as in more modern days, fanciful representations of those commemorated," appears from the examples published in this very book to represent nearly the reverse of the fact. The inferior effect and less serious and monumental character of the later brasses is in great measure actually due to their more realistic treatment. In the earlier brasses the knight in armour is shown in a stiff, formal flat drawing—a kind of elevation drawing, so to speak—which is very severe in style and solemn in expression, but does not convey the idea of portraiture. In the modern examples there was obviously, from the more varied and individual character of the heads, a more decided attempt at portraiture, as well as an attempt to give a perspective representation of the figure instead of a flat diagram. It is very possible that the engravers of the earlier brasses would have done the same had they had the requisite skill in drawing. As a matter of fact, they had not, and their brasses are therefore less realistic than the later ones, but it is quite possible that they were as realistic as their artists knew how to make them. The inability to represent with more realism was perhaps an actual gain; it necessitated a severe style of execution in harmony with the architecture to which the brasses formed a kind of decorative adjunct, and which gives a pathos and solemnity to these more ancient figures beyond, we admit, what is found in the seventeenth century examples. But we are by no means sure that the difference arose from any deliberate feeling or intent on the part of the older engravers; it was a matter

of "environment" as much as anything else.

Where the older brass engravers were really superior to the later ones was in the fact that, whether from instinct or deliberate choice, they confined their delineations to the expression of the outline and the main lines of armour or dress in a comparatively few carefully-designed lines, and with no attempt at shading or pictorial effect. It is the shading and hatching that spoils the effect of the later brasses so much. The process is emphatically one for outline drawing, for clean and precise lines, each of which has its meaning, and not for shading up; by the latter process the decorative appearance of the brass is only blurred, and the pictorial effect supposed to be aimed at is, after all, not achieved. Here the older men were really superior as artists to the later ones: they knew better where to stop, and what were the limits of expression of their process.

Among the examples given in this book (which contains no fewer than 109 plates of large octavo size), none are finer in an artistic sense, or more impressive in effect, than the armoured figures of dates 1395, 1405, 1407, shown in plates 96, 39, and 40. In plates 40 and 96 (from Cobham and Seal respectively), the armed figure is drawn in the simplest lines, yet with conscientious attention to the construction of the mail; the band of geometric decoration around the hips has the more effect by contrast with the plain surfaces of the rest of the body-armour; and the chain-mail for the neck, out of which the head rises, gives a kind of leonine breadth and grandeur to the figure which is very impressive. A great deal of this effect is a matter of costume, no doubt; it did not appeal to the contemporaries of the person commemorated as it appeals to us. From our modern point of view it seems a costume of such majesty and dignity as is never met with now, and the simple and severe form of engraving in which it is shown seems equally in keeping. No. 40 the author calls "the finest military brass of the period." There is an inscription round and an elaborate architectural canopy over. No. 96 has also a decorative inscription border, with the emblems of the Evangelists in small panels at the angles. A characteristic contrast to these two is the brass of Thomas Nerynson (Plate 51), from Easby, in a kind of "elegant" attitude, drawn in perspective, with a meek, slightly-stooping attitude; this is the best of several of somewhat similar stamp

\* Kentish Brasses. Collected by W. D. Belcher, Member of the Kent Archaeological and Hærcian Societies. London: Sprague & Co. 1885.



dating from the latter part of the sixteenth or the early part of the seventeenth centuries. In regard to grandeur of style and character these are, no doubt a great descent from the early fifteenth-century examples, and the change is not less marked in the female figures, from the grandly-flowing robes of the earlier figures to the thick-waisted, wide-skirted, and often hatted women of the sixteenth and seventeenth century brasses, with their skirts in some cases resembling a large butt or barrel out of which the head and shoulders seem to rise. This, again, is more a matter of costume than anything else; but it is sufficient to make all the difference between the heroic appearance of the more ancient figures, which are emphatically those of knights and ladies, to the comparatively bourgeois style of the figures of the later time, the women especially, whose brass effigies seem those of pious house-wives rather than of high-born ladies. It is noticeable that the earlier brasses seem to exaggerate very much the thin proportions of the waist in the female figures,—apparently, then, as among many unwise persons now, considered a mark of feminine superiority of style and breeding; but the effect is less ugly in the flowing robe of the older period than in the later or the modern dress, where the pinching in of the waist is deliberately marked and emphasised.


Architectural canopies are numerous in the brasses illustrated in this book, mostly of much the same date, about the early part of the fifteenth century; and even when there is a difference of half a century between them, from *circa* 1350 to *circa* 1400, there is little distinction in feeling or character of detail. They generally consist of a framework formed by a very thin buttress seen in front elevation, with its base mould and an open stage with a crocketed pinnacle over at the top, and a profile indication of a shaft and capital on the inner sides of the buttresses, from which spring a foliated arch with an ogee crocketed and finial gable; in fact, they are like the detail of a bit of rood screen architecture of the period represented *en silhouette*. An example from Cobham dated 1298 shows a shaft only, without the buttress form, supporting pinnacles with a trefoil arch and a straight-lined crocketed gable between. In one case, dated 1450 (plate 100, from St. Clement's, Sandwich), occurs the geometrical delineation of a groining under the canopy, indicated in single lines, giving the projected curves of the ribs; this is unusual, and hardly in place in a representation on the flat, as a brass must necessarily be.

A figure of the rector, Peter de Lacy, from Northeast Church, date 1375 (plate 88), is remarkable as a fine example of the decorative treatment of the sacerdotal robes in a manner quite accordant with the severe lines proper to a brass. There are several things in the book which are among the curiosities of brasses. A very odd one is the representation, from Margate, of the figure of the deceased as a skeleton, a piece of sensation unusual for the period to which it belongs (1146), but which may be paired off, as a piece of bad taste, with the skeleton tomb at Lewesbury. The mural brass from Maidstone (plate 76) is a curious example of a kind of bad quasi-Classical architectural framework to the series of figures. Perhaps the very oddest thing is the brass of Mistress Silvester Lambard, from Halling (plate 69), representing the deceased in a four-post bed, in a room defined by lines drawn to a vanishing point for the flooring, and a representation of a wall with masonry joints behind, her four older children standing about the floor, and the twins in a cradle by the bedside. The date is 1587. There is a kind of semi-humorous pathos in this; but it is needless to say that it is quite out of keeping with the artistic conditions of brass engraving, as well as with monumental character in the higher sense.

The brasses are shown in the usual way produced by rubbing: white lines on a black ground. Processes have been suggested lately for obtaining rubbings, or transfers, of them with dark lines on light ground, so as to give the real effect of the brasses, or some-

thing more like it. In regard to truth of effect this is desirable; but as far as brilliancy and attractiveness in the illustrations are concerned, we imagine nine people out of ten prefer the white on black as ordinarily shown, in which medium, to say truth, the decorative effect obtained often surpasses that of the originals; and considering that the facts of the design are conveyed with equal accuracy by either system, we do not know that there is really any necessity to change from a system of reproduction which is very simple and direct, and has the additional merit of making a very picturesque and effective plate. Still, it is as well to remind brass-rubbers and brass illustrators that the positive, instead of the negative, effect can be obtained, and that some readers and students may prefer it.

#### COLFE GRAMMAR SCHOOL COMPETITION.

HE designs by the five architects who were selected, after the first sketch-competition, to compete in the second competition for the proposed new Grammar School, have been exhibited this week in the Hall of the Leather-sellers' Company.

The stipulated limit of expenditure, 4,500*l.*, appears too small for the carrying out the scheme in a proper manner, as it is to include not only the building, containing a hall or large room, five class-rooms, rooms for masters, dwelling-rooms for porter and family, and lavatories and urinals for 200 boys, in a separate building apart from the school; but the same sum is also to include the entire completion of the playgrounds and of an ornamental fence on a dwarf wall with stone coping on the Lewisham Hill frontage. In the second notice to competitors a laboratory was also added to the requirements, but nothing seems to have been added to the original stipulated cost in consequence of this addition to the building. Each of the five selected competitors is to receive 25*l.* for his work. The Governors intend to employ as architect the author of one of the selected designs, but do not bind themselves to do so or to carry into execution any design selected. The plans are to show provision for future extension. The sum named does not include school fittings.

Taking the designs in the order of hanging, the first is that by Mr. E. Lyne Parsons. He, with one or two other competitors, adopts the plan of making the large hall the approach to most of the class-rooms, avoiding corridors to a great extent. The hall lies, roughly speaking, north and south, or parallel to the roadway of Lewisham Hill, and the class-rooms are mostly east and south of the hall. This condemns some of the class-rooms to a south light, which is not desirable in summer, as it means either working under a hot sun or with blinds down, either condition being very annoying to the workers, and much better avoided. The masters' rooms are on either side of the entrance. Some of the hat-and-coat rooms are practically lobbies of communication, which is not a very convenient or suitable arrangement. The design is a good and effective one, in the prevalent style of the day, with pilasters and window-heads apparently to be executed in brick, and shown in a good pen perspective. There is a clock-tower over the entrance. The whole seems far too ambitious, however, for the stipulated cost.

Messrs. Clark & Moscrop's design, which hangs the next, is a studiously plain and unambitious school-house, Elizabethan in character as far as architectural character is given to it. The drawings are not attractive, but the authors have shown good sense in studying economy under the circumstances, and there is nothing untasteful or unsuitable in the design. The hall is here also placed with its length north and south, but the five class-rooms are placed to east and north of it,—a much better arrangement in regard to light than in the last-named set. A corridor is carried round three sides of the hall; on the east side the three class-rooms are

separated from it by movable partitions. The hall is lighted, besides an end window, by a range of small clearstory windows high up in the open timber roof, making an agreeable feature externally, but there may be a question whether it would be quite adequately lighted. Generally speaking, this seems a design suitable and well-planned, and has evidently been devised with the desire to go it, if possible, within the stipulated cost.

The design of Mr. H. T. Bonner shows some originality of treatment in the planning. The hall runs north and south, but at the east or further side of the building; three class-rooms are placed westward of it partitioned off and lighted towards Lewisham Hill; in front of these runs a corridor on a lower level communicating with entrances at each end, and in front of this are three hat and cloak-rooms in apsidal form opening out of the side of the corridor. The class-rooms are lighted above the level of this portion. These class-rooms with the little apses below them and the hall rising behind make a picturesque bit of architectural grouping, shown in a good water-colour perspective; but the arrangement of a stair from the corridor out of the floor space of each class-room is not a convenient or sightly one, and there is some oversight as to the levels, for we observe there are ten steps from the corridor level to the class-rooms, but only five from the same level to that of the end corridor leading to the hall, though on the section the hall and class-rooms are shown as on a level floor throughout. Of the other two class-rooms, the Head-Master's has a south light, the remaining one an east light. The design is obviously beyond the limit of cost.

The design by Messrs. Giles, Gough, & Trollope is the only one in which the principal entrance is not from Lewisham Hill but from the north end of the building, with a vestibule opening into the end of the hall, which is placed north and south, with three class-rooms on the west side partitioned off so as to combine with the hall, and two on the east side separate, between which is the exit to the playground and to the covered way to the latrine. The authors have placed the laboratory out in the playground, reached by the covered way, and forming part of the latrine block. This has its advantages in the way of position, for keeping smells of chemical work away from the main building, but it must add to the cost. There are no corridors except the short entrance one, the hall being the centre of traffic. The design is of a very plain character, with square mullioned windows; economy having been studiously considered as far as architectural treatment is concerned.

The design by Messrs. Weatherley & Jones is, in point of architectural treatment, the most picturesque and characteristic of the set, and the least costly among the three which aim at architectural effect; it is shown in a well-executed pen perspective. There is a central feature with two tiers of dwarf pilasters, with a gable over, which marks the entrance, and a gable at each end of the front. A small clock-turret forms a central feature on the ridge of the roof. The plan is simply a collection of rooms ranged about and opening chiefly from the hall, which runs east and west, or at right angles to the direction taken in all the other plans. Four class-rooms open, two out of each side of it, two of which therefore have south light; the fifth class-room is at the north-west angle of the building, balanced by the laboratory at the south-west angle; the entrance between them. The four class-rooms can all be thrown into the hall at pleasure. The plan is a cleverly-contrived one, and the whole scheme combines picturesque effect with practical considerations of concentration and economy of space and construction.

The problem of economy with convenient arrangement under the conditions imposed appears, however, to be best solved in Messrs. Clark & Moscrop's design, as far as we can judge from a comparison of the drawings apart from the architects' descriptions, which were not appended to them. In fairness to the architects, this ought always to be done when public comment on designs is invited.



NOTES.

**T**HE case of "Claxton v. Mowlem & Co.," which was heard before the Court of Appeal this week, is an illustration of the working of the Employers' Liability Act. The plaintiff was in the employ of the defendants, unloading ballast from a barge, a full bucket being sent up and an empty one down simultaneously. By carelessness in lowering, apparently, the buckets struck each other in passing, and the bucket going down was knocked off its hook and fell on the plaintiff. The latter claimed that the contractors' plant was defective, as the hooks should not have been open ones, and he made out that the banksman's order, "lower away," meant "lower away quickly," and was an incitement to undue hurry. This latter argument, which does not seem to have been specially commented on by the Judges, appears to us utterly absurd. The Court of Appeal, however, non-suited the plaintiff (who had previously been non-suited in the Divisional Court, after being awarded damages in the County Court), on the ground that the use of the open hook, which was proved to have been always used by contractors in work of this kind, did not amount to a defect under the Act, and that the banksman was not "delegated with the authority of the employer." We are sorry for the plaintiff, but we quite concur in the verdict on the evidence given. The case was one of those far too common ones of working men injuring each other by want of proper care and precaution in what they are about; and the moral is that they should learn to be more careful.

**S**IR ROBERT RAWLINSON, in his letter in Wednesday's *Times*, makes another vigorous attack upon the policy of the Metropolitan Board of Works in regard to the London sewage problem. He fully emphasises the doubts which have been frequently expressed in these columns, and by many engineers, as to the permanent utility or efficacy of the costly precipitation works now nearing completion at Barking,—which were fully described in our columns a fortnight ago. Indeed, Sir Robert goes so far as to say that these works, instead of tending to the "purification" of the Thames, as was gratuitously assumed by a *Times* reporter, will ensure "the continued pollution" of the river. Sir Robert says that on this question of sewage purification the Board "have gone mad from the beginning, the works they are now prosecuting being the ultimate passion of madness." He charges the Board with having entered upon the enormous works now in hand at Barking and Crossness without informing themselves of the present position of the sewage question. He says that they evidently do not know "what good progress has been made in the use of sewage when applied to land in broad irrigation in England and on the Continent, where the entire sewage of the town is disposed of year by year and all the year round, so as not to be a nuisance. There are sewage farms in England sufficient to convince any open-minded persons that where land can be acquired for broad irrigation the problem of what to do with sewage is solved. But on a very large scale, out of England, there is Berlin, where, by pumping, sewage is distributed all the year round over some thousands of acres of land with perfect success, and that which is done for Berlin may be done for London." Sir Robert denies that the Board are carrying out the recommendations of Lord Bramwell's Commission, as they profess to be doing. As Berlin has been mentioned by Sir Robert, we take the opportunity of saying that Mr. Charles Hancock, F.R.S., who has recently called attention to the subject in our columns, has lately received a letter from Herr Stadtrath Marggraff, the Chairman of the Sewerage and Sewage-Disposal Committee of the Berlin Municipality. Herr Marggraff writes:—

"We and the inhabitants of Berlin, as well as of the district around, are fully satisfied with the

sewerage of the town and with our irrigation system. Before beginning our works we have, for about ten years, made experiments, which are well described in the work, 'Cleansing and Drainage of Berlin' (Reinigung und Entwässerung Berlin), in about fourteen vols., with maps; and now that these works have been in operation for about fifteen years we are more and more satisfied every year. At the same time, the Berlin Sewage Farms (as you will gather from the annual report I send herewith) are beginning to yield a better revenue—even to the extent of giving a profit of two per cent. on the outlay—which I hold to be a very favourable result, considering the very extensive costs we have been put to in the preparation of the land, its levelling, draining, &c. We hope in the future for further favourable and even better successes, and we do not by any means think of giving up our system or adopting any other. I maintain that our method is the best—nay, for a large town, the only possible one. Deodorisation, chemical processes, precipitation schemes, are one and all—when tried on a large scale—hardly capable of being carried out with effect, and are very expensive too; while as to the resultant sludge, not only is it impossible to make advantageous use of the same, but the mere getting rid of it is a most difficult matter."

**O**N Monday the question was asked in Parliament as to the procedure in regard to notices to acquire property for street improvements in London during the next session of Parliament, in view of the fact that, while the London "County Council" will not be constituted in time to give the necessary notices, the Metropolitan Board of Works would have no power to carry out any improvements of which it might give notice. Mr. Ritchie was of opinion that there was nothing to hinder the Board of Works entering into schemes for street improvements and giving the notices, leaving it to the County Council, as the successors of the Board of Works, to determine whether they would proceed with any measure which the Board of Works might have introduced.

**T**HE melancholy railway accident at Hampton Wick seems to have been one of the class of entirely inexcusable railway accidents—not the result of unexpected failure of any portion of the mechanism of the rolling-stock, or of the construction of the road or of signals, but simply and purely the case of an engine being where it had no right to be. Who is the person precisely to blame, and what, if any, degree of moral culpability attached to him, it would not, of course, be right or reasonable to suggest until we have the evidence on the inquest. We may observe, as to the surprise we have seen expressed that the driver and stoker of the light engine should not have observed that they were crossing the bridge on the wrong side, that this is not so extraordinary as may at first sight appear, when it is remembered that a driver is mainly concerned in looking out a-head for signals, not in looking on either side of him; and at night, of course, this is more especially the case; he looks for signal-lights alone, and in a dark night would hardly see anything else. People who have not been on the footplate of an engine do not realise how much the attention is concentrated on the engine itself and the signals in front. There is a well-known case of a driver on the Midland railway who, having pulled up on a very dark night to examine his engine on account of something sounding wrong, pulled over the reversing lever in the course of his examination, forgot that he had done so, and travelled some distance back in the dark before he discovered that he was going backwards. The forgetfulness about the reversing gear was very careless, but the incident shows that a driver may at night know very little where his engine is going.

**T**HE Dean of Peterborough, in a letter to the *Times* of Wednesday, gives an account of a very interesting discovery of a richly-ornamented Saxon tombstone in the course of the excavation for underpinning the interior of the north transept wall of the cathedral. We extract a portion of the letter:—

"The surface of the slab is about 1 ft. 6 in. below the level of the late floor, which, in its turn, was

about 5 in. above the Norman floor. The length of the slab remaining is about 5 ft. 3 in., with a top width of 1 ft. 10½ in., and a bottom of 1 ft. 6 in. The surface is completely covered with the richest Saxon interlacing ornament, forming a design of a central band of ornament about 5 in. wide, crossed at right-angles by rather wider strips of ornament. Three of these are uninjured; the fourth, at the top, was almost entirely destroyed, as I have already said, when the present transept was built by William de Waterville. The design was originally, therefore, a fourfold cross. Each of these crosses is outlined with a double-roll border, the inner one being twisted work. There is thus left between the borders of the cross arms three oblong spaces on each side between the broad central strip and the outer edge of the slab. Three of these are filled in with finer interlacing work, two with star crosses, and one is plain, having been left unfinished."

It has been decided to raise the slab perpendicularly to a position above the level of the new floor, so that it will be visible, but will still mark the position of the old grave which it formerly covered.

**S**OME conversation took place in the House of Commons on Monday evening in regard to monuments in Westminster Abbey, arising out of the fact that the erection of the monument to Lord Shaftesbury had been delayed owing to the committee not having been prepared with the funds to pay the fee of 400*l.* due to the Dean and Chapter of Westminster before the monument could be erected. The fee has been reduced to £250 in consideration of the fact that the erection of the monument is a matter of national interest; as the fees go to the conservation of the fabric, they also are paid in the national interest. From some correspondence which had previously appeared in the newspapers, it would appear that the Committee and secretary for the erection of the monument regarded themselves as rather ill-used persons in having this fee suddenly sprung on them, for which they were not prepared. But why did they not ascertain in the first instance the conditions of erecting a monument in Westminster Abbey? They could not suppose that any one was at liberty to bring a monument and put it up there as he pleased. Mr. Cavendish-Bentinck, in accordance with his usual policy in regard to art of trying to prevent anybody from doing anything, inquired whether the Government would consider the amendment of the Westminster Abbey Act with a view to prohibit the erection of any more monuments, but got no consolation from the leader of the House. Mr. T. P. O'Connor's cynical suggestion, that it might be well to wait till some years after a man's death before deciding that his fame justified a monument in the Abbey, is not without its point. We could name one bust of late years which would not have found entrance into the Abbey if that course had been adopted. But the deferring of the erection till several years after the death of the subject of the monument would take away a great deal of the interest of its inauguration; and the question as to whether the deceased filled a position in the front ranks of the men of his time is not really a difficult one to decide, if it is put to general public testimony and not to the voices of friends and partisans.

**W**RITING to the *Times* Lord Meath urges that, upon the approaching demolition, and sale of the site, of Millbank Prison, "a small part of the site should be made into a public playground, and another into a garden"—say, five out of the total 23 acres. This prison, one of the largest, and certainly the most costly of its kind, was begun in 1812, upon a plot of 16 acres, which had been bought some thirteen years before of Lord Salisbury for 12,000*l.* The plan was adapted from Jeremy Bentham's idea for a Panopticon or Inspection House. The six pentagonal buildings served for a while as a Penitentiary for London and Middlesex. In 1843 that style was changed to Millbank Prison. Various faults of construction,—as, for instance, narrow passages and basement and stone-paved cells,—combined with the natural unhealthiness of the situation, have contributed to throw this establishment far behind our modern conceptions of disciplinary or punitive



incarceration. Of late years, certain sanitary improvements having been effected, convicts condemned to penal servitude were conveyed hither to undergo the first period of sentence. Since the destruction in 1881 of the Tothill Fields Prison,\*—successor to the old Bride-well, whose gateway has been set up against the Sessions House wall,—female prisoners have been sent to Millbank.

**AUGUSTUS**, sixth and late Earl of Buckinghamshire, in holy orders, died on October 29, 1885, leaving extensive estates in Ireland and in Buckinghamshire, the latter including the historic Hampden House. The property is heavily encumbered, and several annuities are set up by his lordship's will. An action for administration of the estate has, on two or three occasions during the past nine months, been before the Chancery Division. On December 20th Mr. Justice Kay made an order for the sale or mortgage of the properties in England and Ireland, in so far as is necessary to complete administration of the testator's estate. On April 13th an order was made for the sale of the Irish estates; but the tenants—who, it seems, are, as affairs now stand there, the only likely purchasers—cannot be induced to buy land which, as in this case, happens to be vested in co-owners. The matter having been again argued before Mr. Justice Kay on July 31st last, the Court directed that an action should be brought in Ireland for the partition of the estates in that country—those estates to be chargeable with the costs for the same. It was further decided that the order for sale of the English estates shall continue in force, all fair opportunity being first given for the sale in Ireland.

**THE** manor of Great Hampden is reputed to have been granted by Edward the Confessor to the ancestors of a family in whose possession it remained, by direct inheritance, until 1754. In the parish church of St. Mary Magdalen are numerous memorials of their house. The most ancient are the brasses to John Hampden (1496) and his wife, Elizabeth, and their ten children. Others commemorate Sir John Hampden, Knight (1553), and his two wives; Griffith (1591) and William (1597) Hampden, father and son. And here is the monument that was erected over the patriot John Hampden's grave by the Hon. Robert Trevor, who had succeeded to the property on the death of a John Hampden, last inheritor. Sir John Hobart, of Bickling House, Norfolk, married, circa 1655, for his first wife, Mary, widow of Colonel Hammond, and sixth daughter of John Hampden. His grandson, John, was elevated Baron Hobart, of Bickling, in 1728, and advanced Earl of Buckinghamshire on September 5, 1746. The main front of Hampden House, in the Classic style, was built by the above-named Robert, fourth Lord Trevor, who had assumed the surname and arms of that house, and on June 14, 1776, was advanced Viscount Hampden. The recent sale† of John Hampden's rapier—the blade 38 in. in length, inscribed "Wilhelm Wirsbergh, me fecit Solingen,"—occasioned some fine talk about its being the identical weapon which had been waved against Rupert's dragoons on Chalgrove Field. But there is extant a MS. cited in Gibbs's "Worthies of Bucks," and written by Lord Oxford upon the authority of Sir Robert Pye, of Farinford House, Berkshire, a son-in-law of Hampden. Pye's story, delivered to Colonel Sir Edward, father to Robert, Harley, is to the effect that Hampden himself, just before his death, said to Pye that one of his over-charged pistols had burst, shattering his arm, in a skirmish with the Royalists between Chalgrove and Thame. Beset by Rupert's men, and failing to reach Pyrtton, he turned his horse northwards, and managed to ride round to Thame, where, at the then Greyhound Inn, now a shop in the High-street, he expired on

Saturday, June 24, 1643. On the next day his remains were laid in the church we speak of. In 1863 a plain stone monument was erected near to Honour End Farm, in the parish of Prestwood, co. Bucks, with the inscription, "For these lands in Stoke Mandeville John Hampden was assessed 20 shillings ship money, levied by command of the King without authority of the law, 4th August, 1635," &c., &c.

**ON** Thursday, the 2nd instant, were sold at Phillips's Auction Rooms, in New Bond-street, the carved oak panelling and fittings from the old Chancery Courts, Lincoln's Inn. The two Courts that stood within Old-square were pulled down at the close of 1883. They were erected after the passing of an Act in 1841 for the appointment of two additional Vice-Chancellors, and formed the scene of many a suit similar to that of "Jarndyce and Jarndyce," which Dickens describes as being heard by the Lord Chancellor in the adjacent (old) Hall. In March, 1884, was demolished the Court which was built in 1819 at the north-western return of the then lengthened Hall, and wherein Sir Lancelot Shadwell, last titular Vice-Chancellor of England, used to sit. This was latterly the Court of Sir Richard Malins, with whom, in January, 1882, died also many of the more archaic traditions of the former Court of Chancery. As touching Old-square, we announced some twenty months ago that, by leave of the Benchers, the Society of Arts had undertaken to affix a memorial tablet against the chambers, at No. 24, which Mr. Secretary Thurlow occupied during the interval from November, 1646, to November, 1659. Old-square,—its staircases yet unnumbered,—was then known as Gatehouse-court. The duration of Thurlow's tenancy is clearly fixed by entries in the "Red Books" of the Inn. Dismissed from office, Thurlow disposed of his life interest here, and bought a similar term of some rooms on the upper two floors of a staircase in Dial-court, that was subsequently numbered as 13. In such a matter of general interest it were not impertinent to wish that the Society of Arts will delay no longer to fulfil their intention.

**A** CORRESPONDENT who is well acquainted with the lock trade writes:—"Architects and builders would do well to be upon their guard against certain recent developments in the manufacture of locks and keys which are no doubt the results of competition. First of all, let us take what are known as 'levered' locks. The only security of 'levered' locks consists in an arrangement by which the key on being turned catches up the levers each at a different level, to fit in with the notches of the key, until a certain point, at which every lever becomes parallel. This arrangement involves great care, and calls into requisition mechanical skill of a high order, and, in former years, the advantages in the way of real security thus provided were cheerfully paid for. America first set the fashion of making locks having levers all moving at one level with the key, so that, whether one or ten levers were inserted, it made not the slightest difference to the 'security' afforded, while, as a matter of fact, the so-called 'security' was not equal to the common 'warded' lock. Shams in 'wards' are as common as shams in 'levers.' Take, for instance, a 'solid ward.' This is supposed to be a ward cut or turned out of solid brass, having a series of semi-circular steps exactly fitting in to the corresponding wards in the key. The lately-developed 'sham' in 'solid wards' is that the wards are not solid, but hollowed underneath until they present a flimsy substance, and the wards of the key are so coarsely cut that they will 'fit anything.' The wholesale use of cast-iron keys is another serious question for the architect and builder. Keys hand-cut, or even machine-cut, afford a certain degree of variety in the wards which guarantee some sort of wholesale variation; but keys cast with the wards in, and produced by the million, with perhaps a dozen various wards in each thousand of keys, suggest at once to the burglar a prospect of easy business in the days to come."

**"BLÄTTER für Architektur und Kunst"** is the title of a new architectural and art magazine, issued by Messrs. Braun & Co., of Berlin. It gives plates of new buildings, executed by the "Lichtdruck" process, which is analogous to what is known in England as "Phototype." These include a rather remarkable view of the tower of the Catholic Hof-Kirche, in Dresden, taken from the roof of one of the aisles. In the illustrations of modern work the architectural interest is hardly on a par with the execution of the plates.

**WE** have received a copy of the *Revue Universelle Illustrée*, possibly a hint taken from Mr. Harry Quilter's *Universal Review*, and apparently about on the same intellectual level. It contains political, literary, and artistic articles, musical compositions, a *feuilleton*, a pretty little sonnet by Pierre Gauthiez, and various illustrations, not of a high order of execution. An article on the "Ancienne Manufacture de Sévres et ses Privilèges," the illustrations to which are the best in the number, may interest our readers. Our general impression, however, is that in these omnium gatherum magazines, where every kind of thing is offered at once, the usual result is that none of it is much worth having, except for very idle and superficial reading.

**THE** *Scottish Art Review*, which now appears as an illustrated monthly, keeps up its character as a literary matter, and gives its readers two charming reproductions from Corot and another from one of Romney's portraits; other articles are illustrated by well-executed marginal sketches. There is a little too much of what may be called the cant of aestheticism in some of the articles, but there is a good deal of thoughtful and suggestive writing.

**THE** June number of *Artistic Japan* has at last appeared—considerably out of date, it must be confessed. The illustrations, very well executed, include some charming bits of floral decoration, a ridiculous figure, and the ghost of a landscape.

#### THE LEAMINGTON MEETING OF THE ROYAL ARCHEOLOGICAL INSTITUTE.

MANY years have passed since the members of the Royal Archeological Institute held a Congress-meeting in or near Warwickshire, and therefore the members in general were pleased to find that so new and so central a place as Leamington, and one whose neighbourhood contained so many scenes of interest, had been chosen by the Council as the headquarters of this year's meeting. The Mayor and Corporation of the town, who invited them, have done their best to make the meeting a success; and, if the weather continues to improve a little, there can be no doubt that their object will have been attained. And the programme issued is certainly an inviting one; for it is not every neighbourhood in England that can show rival attractions to Stratford-on-Avon, Kenilworth, Warwick Castle, Stone-leigh Abbey, Coventry, and Baddesley Clinton; nor would it be easy to find a more kindly and genial President than Lord Leigh, the popular Lord Lieutenant of Warwickshire. Nearly all the magnates of the county give their names as patrons or vice-presidents, including the High Sheriff, Lords Northampton, Aylesford, Warwick, Clarendon, Denbigh, Jersey, Dormer, Compton, &c., Archdeacon Holbeche, Mr. H. S. Lucy, and Mr. J. Halliwell-Phillips. The local and general committee also was exceptionally strong,—nearly eighty in all, including most of the Midland antiquaries and the mayors of Leamington, Birmingham, Coventry, and Stratford-on-Avon. There are good names also among the presidents and vice-presidents of the three sections,—Antiquarian, Historical, and Architectural,—namely, the Revs. J. Hirst and W. Hunt, and Chancellor Ferguson, Dr. Cox, Professors Clark and Browne, the Rev. C. R. Manning, Mr. C. A. Buckler, and Mr. J. T. Micklethwaite.

The proceedings of the meeting were commenced on Tuesday by a gathering in the large room of the new Town Hall, which has been

\* See the *Builder*, March 8 and 15, 1884.

† At Messrs. Sotheby, Wilkinson, & Hodge's, on Tuesday, March 20, 1888. From the collection of the late Mr. J. Hain Friswell, purchased for fifty-eight guineas, for Mr. T. Bryant, of Surbiton.



placed at the disposal of the members by the Mayor and Corporation of Leamington. At the meeting of the Institute and those of the Warwickshire Archaeological and Natural History Society were favoured with a public reception by the authorities of the borough, represented by the Mayor, Mr. John Fell.

This done, Lord Leigh, as President of this year's meeting, was placed in the chair in the room of Earl Percy, and delivered his inaugural address, Lord Percy introducing him with a few brief remarks on the marked difference between the objects of interest presented in Warwickshire this year to the Institute and those of the objects of interest to which they were introduced in Wiltshire last year. Lord Leigh, in his address, briefly recapitulated the chief points of attraction that would be seen at Broughton Castle, at Compton Wynyates, at Kenilworth, at Baddesley Clinton, at Stoneleigh Abbey and Church, at Warwick Castle and Guy's Cliffe, and, above all, at Stratford-on-Avon, where not only Shakespeare's bones were revered, but where to deny his claim to be the author of his dramas was held to be rank heresy and deserving of malediction among Warwickshire men. On the conclusion of the President's address, a vote of thanks to Lord Leigh was passed by acclamation.

After luncheon, the party found their way to the Great Western Railway Station, where a train was in readiness to take them to Stratford-on-Avon, to make the customary pilgrimage to the birth-place, home, and burial-place of William Shakespeare. On reaching Stratford they first inspected the great dramatist's birthplace in Henley-street, under the guidance of Sir A. Hodgson, Mr. Hawley, and the Rev. Mr. Laffan. This house is so well known to the general reader by description and by photography that it will hardly be necessary to describe it at any length. It is a low, antique building, probably of Early Tudor date, and consisting of a ground-floor and an upper story, with small, deep-set windows, and a roof of heavy, dark-red tiles. The house at various times suffered sadly by "improvements" and alterations from the appearance which it must have presented when Shakespeare was born, part of it being converted into the Maidenhead Inn, and the rest into a butcher's shop. It was in an upper room in this last-named portion, according to local tradition and the opinion of the learned, that Shakespeare first saw the light of day. The entire double house, after passing through several hands, from Susannah Hall, the poet's daughter, to whom he left it, was bought, about forty years since, by the public, and subjected to a very "conservative" restoration, which has had the effect of bringing it back very much to its original condition. The apartment which we first enter on the ground-floor is somewhat gloomy and dreary. It is low, and panelled with dark wood, and the windows are small. Its ample fireplace is probably as old as the house itself, and at it young Shakespeare, as a boy, must often have warmed his hands when he came home from the Grammar School, in Chapel-street, on winter evenings. We pass out of it and climb a winding staircase of dark wood and find ourselves in the chamber which is regarded as his birthplace. Everything here is ancient, and preserved with the most scrupulous care, and the room is lighter and cleaner than the apartment which we left. Its walls, however, are rough and bare, and its fireplace is of a later date than the one below. But its walls were doubtless hung with tapestry or arras when Shakespeare's parents were its occupants, and that would have made it look more homelike. The walls and even the ceiling of this room are inscribed with the autographs of pilgrims from all quarters of the world who have inscribed their names with feelings of reverence; and, though the practice is one more honoured in the breach than in the observance, yet, as Washington Irving observes in his *Sketch-Book*, "these signatures present a simple but striking instance of the spontaneous and universal homage of mankind to the great poet of nature." A visitor's book is kept in the house, and in it may be seen the signatures of almost all the great literary lights of our century; and Sir Walter Scott has scratched his name on the window pane. In the room adjoining is a fine oil painting of the poet, thought to be original, a present from Mr. William O. Hunt, Town Clerk of Stratford. The garden behind the house is most carefully kept, and not a plant or flower is suffered to grow within it which has not been mentioned by Shakespeare. Some lines written on the wall of the apartment above-mentioned by Washington Irving

in 1821, but long ago obliterated, were fortunately preserved and placed on record by a correspondent of the *London Standard*. They ran as follows:—

"Of mighty Shakespeare's birth the room we see,  
That where he died in vain to find we try.  
Useless the search—for all immortal he,  
And those who are immortal never die."

The party inspected also the museum, which is enshrined in the other part of the house; in it are Shakespeare's high-backed chair, the fac-simile of his will, a collection of miscellaneous objects connected with himself and his poems, and portraits of his friends and interpreters.

A walk of five minutes or so, along the centre of the town, takes us to the Guild Chapel, dedicated to the Holy Cross, still standing close to New Place, or rather to its site, for New Place was pulled down by reckless and sacrilegious hands about the middle of the last century by its then occupant, the Rev. Francis Gastrell—a man whose name is still execrated in Stratford—the same who cut down the mulberry-tree planted by Shakespeare's own hands because he was annoyed by the frequent visits of pilgrims to the sacred spot. The mulberry-tree was cut up and made into snuff-boxes and other relics; but of New Place, where the poet spent the last eighteen years of his life, not a vestige remains.

The party lingered for a long time at the Grammar School, where within the last few months two frescoes have been found representing the union of the Red and White roses—an ornament probably set up in the newly-founded school on the accession of Henry VII. Here, and at the Guildhall Chapel, the Rev. Mr. Laffan showed himself a most able interpreter.

At the parish church, the party inspected the grave and bust of Shakespeare, which are so well known that we need not repeat a description of them; and those who had visited Stratford previously were glad to notice the recent removal of the side galleries. Precentor Venables, mounting the pulpit in the nave, gave a brief description of the fabric, showing that it was built at two different periods, in the thirteenth and fourteenth centuries, and pointing out how admirably the later artificers had wedded the new design to the old. The entire building, he remarked, very much resembled St. Mary's Church, Oxford, in some points, and in others St. Mary Redcliffe, at Bristol, especially in the panelling above the arches of the nave and below the clerestory. He trusted that before long the beauties of the north transept would be revealed by the removal of the organ.

The party, having halted at the fountain erected last year by Mr. G. W. Child, of the United States, in the Old Market-place, made their way to the station, and returned to Leamington in time for the evening meeting, when the Rev. Joseph Hirst opened the Antiquarian Section (of which he is the President) with a learned paper on the connecting links between the art of the Eastern nations and the art of Greece in its early period, which he showed to be found in the voyages of the Phœnician merchants. We are able to give here a portion of the paper:—

Archæology, as it is now understood, or the study of the monuments and relics of antiquity, was never pursued with greater ardour than in the present day. During the last century, and in the beginning of the present, classical antiquity was the object of serious study, and many admirable works, some remarkable for their colossal learning and exhaustive research, were published by the scholars of Europe in illustration of the history, laws, customs, and remains of classical antiquity. Great and important, however, as were these works, which will ever remain a monument of the industry, culture, and intelligence of their authors, they were based on a study of mere books and records, and on such inductions as might be drawn from a knowledge of the Present to unravel and unfold to us the history of the Past. It is only, to speak roughly, within the last quarter of a century that excavations have been conducted on a large scale, and the wrecks and monuments of antiquity have been investigated and studied on the spot. The information derived from actual contact with the tangible remains of the past, the sureness of touch gained by familiarity with visible structures, the light shed on the dark regions of antiquity by this new method of practical experience, can be better imagined than described. It is impossible to say how, by the aid of this decisive test of actual measurement of personal inspection, surmises were found to

be suddenly changed into facts, theories erected on insufficient grounds were scattered to the wind, and many a cherished hypothesis based merely on induction from the present was banished for ever from the domain of science. Suffice it to recall the discoveries made in Assyria, Asia Minor, Egypt, Greece, Italy, and Cyprus, to give an idea of the extent and completeness of the information gained. The names alone of Nineveh, the Troad, Ephesus, Mycenæ, Tiryns, Epidaurus, Olympia, Eleusis, the Athenian Acropolis, Pompeii, and Rome, are enough to assure us of that re-birth of the knowledge of antiquity, and of that return of taste for and interest in the history of the past, which is the characteristic of the present generation. Nay, it may be said that we are but at the threshold of great revelations, and the awakened interest in antiquity of the cultured and educated classes of our age and country gives every promise of rising to the height of the occasion, and of preparing to make still further efforts to gain the prize within its reach, which is nothing less than that of bringing the peoples and places of ancient times within the field of actual observation. The societies recently founded for exploration in Egypt, Palestine, and Cyprus, and the Hellenic Society, the British School at Athens, and the Society of Biblical Archæology, are proof enough of this. Egypt and Palestine alone have every sign of bearing in their womb vast surprises for us. It is quite evident that the knowledge we have of these two countries is as yet in its infancy, and that we are on the eve of making on this yet almost unexplored area discoveries which will confirm the Bible records, and throw light upon its teachings. I am told by a great authority in Egyptology that, in spite of our many discoveries, we have as yet found no record in hieroglyphics of Moses, Joseph, or Jeremiah. But we must remember that it is only in the present century that we have begun slowly and painfully to spell out, as it were, the pictorial language of ancient Egypt; that the number of hieroglyphic records brought under our notice is as yet but small; that an immense number of papyri and of inscriptions are yet to be examined; but amongst the vast and little-known records of ancient Egypt we are almost sure sooner or later to find all that we want. Nay, cannot we even now triumphantly say that at last these hallowed names have, during the last few months, from Egyptian sources, been swimming into our view, thanks to the generous aid and to the efforts with pick and spade of some of our own members? The last half-century has seen revealed to us another ancient language,—that of Assyria,—and we are only now putting together the broken and scattered fragments of its cuneiform tablets, which carry us back in the information they give us to a period of history long anterior to that of Egypt itself. Many other languages of the ancient peoples, which occupied the countries round about the Mediterranean, are still as sealed books to us, and utterly unknown. When the languages of Phrygia, Caria, Lycia, Carthage, Iberia, and Etruria shall have become known to us, and their inscriptions and records read, how much information shall we not receive? During the present year Captain Conder has announced his discovery of the language that was common to the vast empire of the Hittites, and I have only just received news from Italy that Professor Polari is busy translating the old Etruscan inscriptions of Italy, having found a key to their interpretation in the little-studied Basque tongue. From this rapid survey it is evident to what direction the attention of our fellow workers throughout the world is now being chiefly directed. Indeed, the field of archaeological study seems suddenly to have shifted ground, and to be transferred to deeper, wider, richer, and more important strata. Our minds seem to have been lifted out of the narrow sphere of home concerns, and of the region of our own country, and to have been transported to those vaster fields occupied by the nations of antiquity. The study of the monuments and customs of our own country will ever be of immense importance for the illustration of our own national history. But we must remember that we are only one of many nations, and that there is far away in the dim regions of the past, and calling for attention at our hands, an *aboriginal* history, of universal, or, as I may say, humanitarian interest, which concerns us all. Knit, as we all are, in one lasting brotherhood, we cannot but feel attracted to the origins of our race, which, more-



over, contain within them, in some way or other, the germs of all future separate, distinctive, and national developments in the many lands of East and West. The names of Leland, the prince of antiquaries, of Camden, Gale, Stukeley, and Horsley, and of our great county historians, will ever be held in honour, and their labours highly appreciated by us; but they themselves would have been the first to acknowledge, had the regions that are now being explored been known to them, and if the cities and monuments that have now been unearthed could have been visited and inspected by them, that these visible records of the past contain within them secrets of the utmost value, which were more deeply worthy of their attention. For in the far past are the seeds of the future, and it is only by investigating the first efforts of man in art and mechanism that we can thoroughly understand the after developments of Roman and Mediaeval times, and indeed judge and estimate at the present day. It is in the intimate study of the monuments and remains of the ancient world, when man was feebly beginning to shape the records of his history on the native rock, or on granite or marble blocks, and to trace the fancies of his mind on moulded or on pictured clay, that we see those germs of light and beauty which were afterwards to dazzle us with their finished splendour, and to charm us with their incomparable grace on the Acropolis of Athens, and in the baths and palaces of Rome. In all sciences it is the origins of things that require our first attention, and the case is not different in archaeology. May I be allowed, therefore, this evening briefly to draw your attention to that distant and hazy period when man's yearning and attempts after artistic expression were more in a state, we may say, of involution and potentiality, than of actual exercise and execution? It is by peering thus into a time when things were at their beginning, when ideas were assuming form, and forms were settling into shape, that we can come to assist, as it were, at the genesis of art, and by seeing from what it has come see also for what it is striving and whither it tends. A mere dilettante acquaintance with the monuments of antiquity, with ruins and sculptures and heirlooms from the battlefield or from the recesses of the ancient household, is not enough to satisfy the requirements of the modern mind. We live in an age of exact definitions and of scrupulous adherence to facts; when everything concerning man's physical existence upon earth must be brought to the test of accurate observation, and of strict, logical induction therefrom. If we would claim for archaeology a place among the sciences, it must be on this condition, that it is studied in a proper and scientific manner with regard to the facts with which it deals. The rank of a science can be claimed by us for Archaeology only on the condition that we take things at their origin, watch over their progress, and thus come to give every effort of fresh direction imported by the mind of man to architecture, to sculpture, to painting, and the growths and differences apparent in art, in warfare, and in domestic manners, each its proper place in history. And here I must say a word on another advantage to be derived from the study of archaeology—its relation to history itself. I am about to introduce you to a period of the world, and to a scene of man's activity in Europe, dating from before the period when history began to be written. For the office of the antiquary precedes that of the historian. Long before the first literary effort of the historian, there were tools, arms, buildings, and monuments. The period of which we have here hung on the wall some striking specimens in these votive shields that have just been discovered in Crete, the illustrations of which I am now exhibiting in England for the first time, belong to the eighth century before Christ—to a period which, as contra-distinguished from the *pre-historia*, when there were no records whatever, and from the *historia*, when the first literary records began, we had best perhaps style *proto-historia*. An artistic culture flourished on the island of Crete long before the time of Homer. There is no book, we may say of the "Iliad" and of the "Odyssey" where there is not mention of Crete. For its laws it is celebrated by Plato and by Aristotle. In Crete Plato lays the scene of his dialogue on laws. From Crete came the first artists into Greece. But we know that in Crete there were before the Greeks Phœnician colonies, and these were nothing else than so

many emporiums or factories, whence the merchandise of the East was spread over the whole country. History tells us nothing of the actual period of which we speak. Whatever we know about this very ancient phase of Cretan civilization, and of the relations of this island with the East, and especially with Phrygia and Phœnicia, is the outcome of a number of notices and incidents scattered in Classical authors, which have to be tested by the discoveries of archaeology. These deductions from the evidence of visible remains, whether in sculpture or in colour, together with the conclusions we can draw from a naturalistic or ethnological explanation of the most ancient myths, is all the information we can acquire about those primitive times. Hence the historian can now no longer dispense with the archaeologist, and archaeology is absolutely necessary for this archaic and unhistorical period in order to show forth the relations which the different peoples of the earth had then with one another, and to illustrate the high significance which all artistic productions have for the history of religion and the development of human thought.

Professor Clark moved a vote of thanks to Mr. Hirst for his paper.

The other paper, read by the Rev. George Miller, of Radway, treated at some length on the surviving specimens of early Church plate in Warwickshire; having searched the whole county round, he had found none of which he could be sure that it was of pre-Reformation date, though much was Elizabethan. The reading of the paper was followed by a long discussion, in which the Rev. Dr. Cox, Chancellor, and Mr. George Lambert took part. Mr. Lambert expressed an opinion that some of the plate generally thought to have belonged to churches was really secular, and that further researches would probably bring to light in Warwickshire, as elsewhere, some specimens of date earlier than Henry VIII., though probably only a few. A vote of thanks was accorded to Mr. Miller for his paper.

On Wednesday nearly 100 members made an excursion to Broughton, near Banbury, the ancient moated castle of Lord Saye and Sele, and to Compton Wynnyates, one of the seats of Lord Northampton.

We shall continue our report of the proceedings next week.

#### THE CROYDON WATERWORKS.

THE inauguration, on Thursday, the 2nd inst., of the well and reservoir of the new waterworks for the town of Croydon, by the Archbishop of Canterbury, was made the occasion for great rejoicings and festivities; and certainly, if the municipal authorities can succeed, as they hitherto have done, in reducing the rates as often as they increase their expenditure on public works, there will be few people inclined to find fault with their occasional rejoicings. It appears that, whilst in the past fourteen years no less than 147,000*l.* have been spent upon previous waterworks, upon recreation grounds and improvements in drainage, roads, and footways, the rates have come down from over 3*s.* 4*d.* to 2*s.* 6*d.* in the pound of assessed rental. Although the waterworks already in existence continue to give a large supply—last year over two million gallons per day—the increasing extension of the town has called for a large addition of water-supply available over the whole of the borough.

The new works have been carried out from the plans of the Borough Engineer, Mr. Thomas Walker, under the sanction of the Water Committee, of which Mr. Councillor Morland, J.P., is chairman. The well has been sunk into the upper chalk in an isolated hollow near Hare's Bank, a short mile in front of the Archbishop's Palace in the "wilderness" of Addington.

The surface level at this spot is 315 ft. above Trinity datum, and the well, 10 ft. in diameter, is sunk to a depth of 200 ft. At a depth of 142 ft. headings have been driven off from the well in various directions, by which means various important water-bearing fissures have been cut through and tapped, chiefly on the east side, and from which a water-supply of 2,491,000 gallons per day has been attained. The dimensions of these headings are 6 ft. by 4½ ft., and their total length is 813 yards. Their storage capacity, combined with that of the lower depth of the well, amounts to 502,000 gallons. The buildings, which consist of engine and boiler houses, are lofty and well-designed, and with the tall chimney shaft have a hand-

some appearance. The engine, which is fine and well-proportioned, and of 125 h.p., has been designed by Messrs. Easton & Anderson, on the Woolfe type of compound beam-engine. The high-pressure cylinder is 20 in. in diameter and 4-ft. stroke; and the low-pressure cylinder, 34 in. in diameter, with a 6-ft. stroke. The two pumps are of the bucket and plunger type, 19 in. in diameter and 6-ft. stroke, delivering 72 gallons at each stroke. The long rod of one pump is attached to the beam, and descends to the depths of the well, lifting the water into the headings reservoir under the engine; and the other pump, attached to the piston-rod of the low-pressure cylinder, forces the water along 21-in. iron mains to the new reservoir on the Addington Hills, two miles nearer to the town,—the well being four and a half miles away from the same. The engine will make eighteen strokes per minute, and, therefore, will deliver 77,760 gallons of water per hour. The water, as pumped, has 16½ degrees of hardness. The three boilers are each 26 ft. long and 5 ft. in diameter, and work at a pressure of 100 lb. of steam. The buildings are so arranged that a second set of boilers and a second pumping-engine can be erected in them when required; and they are surrounded by four acres of ground fenced in, and upon which residences for the engine-driver and stoker have been built.

The new reservoir is very long and tortuous, the contour of the summit of the hill having been followed. It is constructed entirely of concrete, formed with the local pebbles of the Woolwich and Reading Tertiary strata, without the puddle backing; and is rendered water-tight by a coating of neat Portland cement. Its length is 420 ft. by 124 ft. wide, and 16 ft. 8 in. deep. Its capacity is five million gallons. It is covered by seven arches, with spans of 16 ft., and rises of 4 ft.; the sustaining walls (2 ft. thick) consist of piers and arches, and there is a division wall 12 ft. in height.

The outer concrete walls of the reservoir are 6 ft. thick at their base, battering to 4 ft. 6 in. at top; and over the covering arches there is spread 18 in. of earth. The level of the overflow is 465 ft. above sea-level, 100 ft. above the high-level tank on Park Hill, and 86 ft. above the highest road in the borough. The delivery main from the new reservoir is 18 in. in diameter to Coombe-lane, whence a 12-in. main runs off to the old reservoir, and a 15-in. main to Upper Addiscombe-road; a 12-in. forward to South Norwood, and a 9 in. to Upper Norwood new Town-hall. There are other branches, the total length laid being about thirteen miles and a half, and the weight of pipe 2,454 tons. The greatest pressure is in Portland-road, being due to a head of 345 feet.

A luncheon was given in a large canvas marquee on the Reservoir, at which the Mayor of Croydon, Mr. J. W. Hobbs, presided, and after which the Archbishop, who had previously started the engine at the well works, opened the valves of the reservoir main and turned the water-supply on to the town.

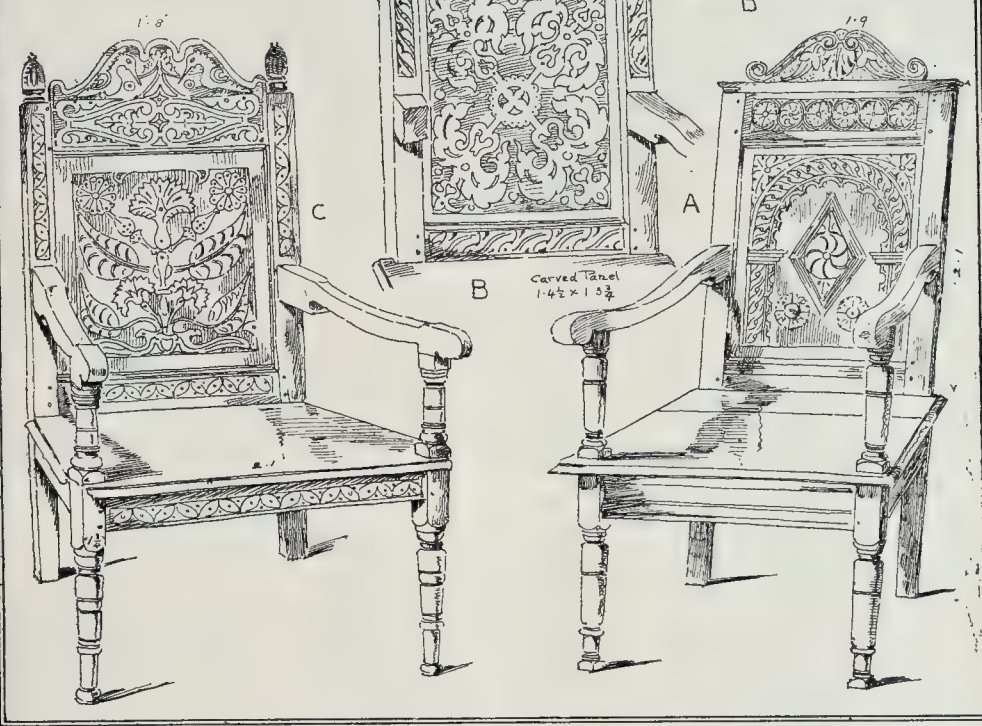
#### THE KENT ARCHEOLOGICAL SOCIETY.

THE annual meeting of the Kent Archaeological Society has just been held at Hythe. The members assembled in the Town Hall of the ancient borough on Wednesday, August 1st, when the routine business was despatched under the presidency of the Bishop of Dover, and many new members were elected. A visit was then paid to the stately parish church, which is now to be seen to great advantage, since the work of restoring the ancient vaulting of the choir and its aisles is now completed. The Rev. T. G. Hall and the indefatigable Secretary of the Society, the Rev. Canon Scott-Robertson, conducted the party over the church, and into the curious crypt beneath the easternmost portion of the chancel, which is filled with human bones. These are not of one time or people, but of many varying races. The members then proceeded in carriages to Lympne, the start being made in a steady downpour of rain, which, fortunately for the comfort of the members, speedily gave place to bright sunshine.

On arrival at Lympne, the ancient church was inspected, and portions of the edifice, erected by Archbishop Lanfranc, were pointed out. The building is, for the most part, a singularly plain example of First Pointed work, justifying the inquiry why a solid Early Norman church should have been almost rebuilt to give place to a fabric equally plain. The castle, adjoining the church, with which it makes a very effective group of buildings, con-



Woodwork from Somerset.  
A & B - Chairs at Dominican  
Friary, Bristol.  
C - Muchelney Church.  
D - from Pulpit, Aller Church.



spacious for many a mile across the flat land of Dymchurch Level, having been examined, the party proceeded to the point nearest to the ruins of Studfall Castle. These remains are those of an ancient Roman *castrum*, ruined by landslips, and now reduced to an irregular mass of disjointed masonry, banded by bright red Roman bricks.

Here Mr. Roach Smith, F.S.A., gave a brief and lucid narrative, not only of the present condition of the ruins, which were visible in the sloping ground, far below the feet of the party, but of the excavations made under his direction, to determine their nature. Proceeding onwards, Aldington Church was visited, and here the members were welcomed by the Rev. G. J. Blomfield. The building contains some good screenwork and stalls, and some late domestic panelling removed from Scots' Hall. The good Perpendicular tower was only completed in the reign of Queen Mary, but the base of a plain Saxon tower still exists in the south-west of the building, used as a vestry. The north side of the nave and chancel were found to be of the same early date, and there is also a tall, narrow doorway.

The remains of the old manor-house of the archbishops is close to the north side of the church. What has been a fine hall of the fourteenth century, with a circular coved roof, may still be traced, although divided into small bedrooms. At the evening meeting, papers were read by G. Wilks, Esq., town clerk, on Hythe Town and on Hythe Church, and Mr. Geo. Dowker read another upon the altered coast line at the supposed site of the *Portus Limanus*.

On Thursday, August 2nd, bright weather tempted a very large party to proceed on the day's excursion, the first stopping-place being Cheriton Church. There is here an elaborate and artistic chancel, built boldly on the slope of the hill. It contains some interesting brasses. The western tower is of great antiquity, doubtless of Saxon date. The openings

consist of jambs and arches formed of small uncut stone. The age of the tower is attested by the fact that it is buttressed for support by buttresses of thirteenth century date, not bonded into the walls. A sham-fight was proceeding on the adjoining heights of Shorncliffe, and the church seemed to be undergoing a siege when the party was inspecting it. Newington Church was next visited. It is a very plain Early Norman fabric, enlarged in the twelfth century. Passing through beautiful country, progress was made to Lyminge Church (dedicated to St. Mary and St. Eadburga), which was fully described by the Rev. Canon Jenkins. The building stands on the site of a Roman villa, and, thanks to the Canon's exertions, the ground-plan has been traced in many places. The buildings have been of great extent, and a large semicircular apse has been traced. On the south side of the church, which contains Saxon work, as well as good examples of most of the later Gothic styles, are the foundations of a simple nave, ending in a semicircular apse. These are most probably the remains of the church occupied by the Saxon princes, Eadburga; but the work is clearly of earlier Roman date. It is composed of tile and masonry, the mortar being formed with pounded brick, and many fragments of wall decoration, in plain Pompeian red, have been met with. The party partook of hospitality in the adjoining rectory, where an interesting collection of antiquities was laid out for inspection.

The visitors left this remarkable spot with reluctance, and, carriages being resumed, progress was made to Saltwood Castle. This ancient residence of the Archbishops of Canterbury has recently been formed into a dwelling-house, by the engraving of various new offices on to the old gateway, which has been entirely restored.\* The remainder of the fabric has,

\* For plans and views of the Castle, as restored, see the *Builder* for August 22, 1888.

fortunately, been left in an undisturbed state of ruin. After inspection, the party proceeded to the inner courtyard, where, surrounded by the ancient walls, they listened to a graphic description by Canon Scott-Robertson, who proceeded to identify the various portions of the castle. The members then dispersed, very well gratified by their inspection of many objects of interest situated in a county of very great beauty, which was seen to great advantage.

#### WOODWORK FROM SOMERSETSHIRE.

UNDER this general title we give illustrations of three interesting Renaissance chairs, much alike in their general principle of design and construction, though varying in detail.

#### THE BUILDING TRADE IN ROME.

ACCORDING to the information given by the British Consul at Rome in a report dated June 13th last, "the year 1887 marked a period of serious trial in the economical and building progress of Rome. The main cause of the crisis as regards house-building was the want of both business capacity and capital on the part of the builders, who sprang up from the most different, and some from the most humble, classes of society, allured by the facilities afforded to the building speculation, and by the encouraging results which had been obtained in the past years of the building activity. Building-ground was then sold at reasonable prices, and a house, including the land on which it stood, used to cost 55 or 60 per cent. of the estimated value reckoned according to the average of rents, and builders could very easily sell at 70 or 80 per cent. of the estimated value, thus realising a profit of between 27 and 33 per cent. As the cost of building-ground increased, and the main conditions of the enter-



prise underwent a notable change, the cost rose to 80 and 90 per cent. of its value, taken on the basis of the rents. The profits of the builders were thus considerably diminished, and the selling of houses to investors became difficult, unless at a loss. The fears entertained by foreign bankers as to the state of the building trade, the limitation of discounts by the local banks, and the panic which seized the firms supplying building materials, brought difficulties to a climax. The sudden check in the sale of building-ground will be severely felt by the said banks and firms, one of which, at the end of 1887, had on hand 280,680 square yards of land nominally disposed of, but the transfer of which has not been carried out, by the fault of the purchasers. One builder, perhaps the foremost, became bankrupt with liabilities amounting to 2,000,000. The class of builders is very numerous, one bank having amongst its customers 350. It is doubtful whether this state of things may be called over-building, when with the slackening of the construction of new buildings house rents became still higher. This shows that the extension of the town answers to a real want of the population. The construction of houses is now conducted with less feverish haste; still the work already begun proceeds regularly, and the greater part of the buildings are brought to completion. The cost of building-ground keeps about the same. In November, 1887, several lots of ground, amounting to 69,512 square yards, situate in the Prati, close to Castel S. Angelo, were sold by auction for 304,160*l.*, averaging 4*l.* 7*s.* 3*d.* a square yard. In May last the appropriation of a large palace, covering 3,756 square yards, situate in the centre of Rome, in the Piazza Colonna, was valued at 241,11*s.* 9*d.* a square yard, and the vendor accepted the condition of taking back a portion of the area from the Municipality at a minimum price of 25*s.* 1*s.* 7*d.* a square yard.

The works connected with the embankment of the Tiber are proceeding regularly. The embankment on both sides of the lower portion of the river from the Church of San Giovanni dei Fiorentini down to the Marmorata and the relative bridges are in a very advanced state of completion. The Ponte Garibaldi will very soon be open to the public. As regards the mode of constructing the new bridge to replace the Ponte Cestio, serious opposition was raised by the Archaeological Commission, and it was arranged to demolish it completely, but to carefully undo the middle arch, so as to have it put up again on the new foundations. The bridge is to be partly reconstructed with the old materials, and is to maintain its present shape in all details.

The new drainage of the city is being conducted on a vast scale. A system of drainage and sewerage, worked on the same principle as that of London, collects the foul matter, which is carried away by a continuous current of water and ejected through the main sewers in the Tiber, far from the inhabited part of the town. It has, however, been discovered that in the quarters situated in the upper part of the town the drainage is in many ways defective."

#### THE AVERAGE METER SYSTEM FOR PUBLIC GAS-LIGHTING.\*

THE writer has been experimenting with regular gas-burners for some eighteen months, with a view to ascertain their reliability under various and varying pressures and conditions, and in the course of the experiments doubt has been raised in his mind as to whether the average meter system is necessary to a reliable and economical determination of the volume of gas consumed in the public lamps. His object in bringing the subject before the Association is to obtain the criticisms of the members on his conclusions, in order that the true system may be revealed.

The average meter system, as practised in the Metropolis, is briefly as follows:—Each lamp is provided with a regulator gas-burner which passes a definite quantity of gas per hour under the varying pressures in the mains; and at certain lamps, carefully selected by the gas company and the local authority, meters are fixed, which record the volume of gas burned. Each month the meters are read, and after striking out the returns of those which show a variation

of 10 per cent. over or 10 per cent. under the theoretical volume obtained by multiplying the number of hours during which the lamps were lighted into the cubic feet per hour to which the burners are set, an average consumption is obtained for the selected lamps, and this is taken as the consumption for each lamp throughout the district. The question raised is, Are the regulator gas-burners sufficiently accurate to be relied upon for the quantity burned without the check of the meters?

In the following experiments, an experimental gas-holder and a minute clock by Parkinson were used. When the burner experimented on was fixed over the meter, it was not removed until the experiment with it was completed. In each experiment the gas-holder was filled with 5 cubic feet of gas, and was not refilled during the time, so as to secure as far as practicable gas at the same temperature and barometric pressure. The increase of temperature in the gas by the increased pressure is common to all the experiments, so that they give a basis of comparison when this slight error is neglected. The water-gauges on which the pressures were recorded were 4 in. below the regulators. The regulator gas-burners experimented on were bought in the open market without the knowledge of their makers, so as to avoid specially-prepared burners, and it is possibly due to this that the results obtained present discrepancies. The names of the makers are not stated in the paper, as the writer does not approve of using the platform of the Association as an advertising medium. The aim of the tests was to find out whether the regulators controlled the consumption of gas under varying pressures at the volume to which they were fixed. The pressures given are water-pressures: thus, 1 in. is ten-tenths pressure, &c.

*Experiment 1.*—Burner used was a 5-ft. fish-tail common burner, said to be a "regulator," but possessing no regulating apparatus whatever. The figures under the pressures give the number of cubic feet per hour:—

|         | PRESSURES IN INCHES. |      |       |       |       |       |       |
|---------|----------------------|------|-------|-------|-------|-------|-------|
|         | 1                    | 1.5  | 2     | 2.5   | 3     | 3.5   | 4     |
| A       | 7.12                 | 8.83 | 10.70 | 11.55 | 12.82 | 13.52 | 14.55 |
| B       | 8.35                 | 7.67 | 10.12 | 10.83 | 13.00 | 12.65 | 13.90 |
| C       | 8.58                 | 7.86 | 10.17 | 10.73 | 11.85 | 12.93 | 13.97 |
| Average | 8.05                 | 8.13 | 10.33 | 11.04 | 12.22 | 13.04 | 13.91 |

These results show that the burners are not regulators. The vertical column of averages shows the greatest variation to be 7½ per cent. The horizontal column of averages shows that the burners at 1 in. pressure passed 35 per cent., and at 4 in. pressure 178 per cent. more gas than they were marked to do.

*Experiment 2.*—Burner used was a 6-ft. bat-wing common burner, said to be a "regulator," but possessing no regulating apparatus whatever.

|         | PRESSURES IN INCHES. |       |       |       |       |       |       |
|---------|----------------------|-------|-------|-------|-------|-------|-------|
|         | 1                    | 1.5   | 2     | 2.5   | 3     | 3.5   | 4     |
| A       | 8.87                 | 11.06 | 12.87 | 13.77 | 14.77 | 16.25 | 16.70 |
| B       | 7.70                 | 10.93 | 11.50 | 12.75 | 13.10 | 14.35 | 16.22 |
| C       | 8.40                 | 10.83 | 12.20 | 12.20 | 14.32 | 15.50 | 16.35 |
| D       | 9.38                 | 11.32 | 12.42 | 13.65 | 15.00 | 16.10 | 17.90 |
| Average | 8.59                 | 11.00 | 12.25 | 13.34 | 14.90 | 16.70 | 16.84 |

The vertical column averages show the greatest variation to be 9 per cent., the horizontal column averages show that at 1 in. pressure the burners passed 43 per cent., and at 4 in. of pressure 181 per cent. more gas than they were marked to do.

*Experiment 3.*—Burner used was a 5-ft. public lamp regulator burner with a regulating apparatus.

|         | PRESSURES IN INCHES. |      |      |      |      |      |      |
|---------|----------------------|------|------|------|------|------|------|
|         | 1                    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4    |
| A       | 5.82                 | 5.51 | 5.55 | 5.47 | 5.38 | 5.16 | 4.98 |
| B       | 5.33                 | 5.39 | 5.23 | 5.17 | 5.08 | 4.85 | 4.60 |
| C       | 5.43                 | 5.47 | 5.31 | 5.15 | 5.03 | 4.83 | 4.65 |
| Average | 5.52                 | 5.43 | 5.36 | 5.26 | 5.16 | 5.01 | 4.81 |

The vertical column averages show the greatest variation to be 6 per cent., and show carelessness in manufacture. The horizontal column averages show that at 1 in. pressure the

burners passed 10.4 per cent. more, and at 4 in. of pressure 4 per cent. less, gas than they were marked to do, or a total variation of 14.4 per cent. They also show that the regulating apparatus checks the waste of gas at increased pressures, but that the burners are not true regulators, for the volume of gas passed falls off gradually as the pressures increase.

*Experiment 4.*—Burner used was a 4-ft. public lamp regulator burner with a regulating apparatus:—

|         | PRESSURES IN INCHES. |      |      |      |      |      |      |
|---------|----------------------|------|------|------|------|------|------|
|         | 1                    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4    |
| A       | 4.27                 | 4.57 | 4.47 | 4.48 | 4.45 | 4.47 | 4.45 |
| B       | 4.18                 | 4.38 | 4.37 | 4.32 | 4.25 | 4.35 | 4.36 |
| C       | 4.33                 | 4.15 | 4.50 | 4.40 | 4.41 | 4.40 | 4.37 |
| D       | 3.95                 | 4.06 | 4.11 | 4.32 | 4.22 | 4.06 | 3.87 |
| E       | 4.30                 | 4.31 | 4.29 | 4.32 | 4.28 | 4.30 | 4.12 |
| F       | 4.31                 | 4.35 | 4.40 | 4.40 | 4.37 | 4.37 | 4.38 |
| Average | 4.22                 | 4.34 | 4.36 | 4.37 | 4.33 | 4.32 | 4.26 |

The vertical column averages show the greatest variation to be 9.25 per cent., and show considerable carelessness in manufacture. The horizontal column averages, which reveal the reliability of the principle of the regulating apparatus, show that at 1 in. pressure the burners passed 5.5 per cent., and at 2.5 in. of pressure 9.25 per cent. more gas than they were marked to do. A study of the figures will show that the regulating apparatus is a good although not a perfect one. The consumption of gas increases with the pressure from 1 in. to 2½ in., and decreases from 2½ in. to 4 in., but, taking the average of the experiment as a standard, the burners show an excess consumption of 1.15 per cent., and a deficient consumption of 2.3 per cent., which is a good result.

*Experiment 5.*—Burner used was a 4-ft. public lamp regulator burner with a regulating apparatus:—

|         | PRESSURES IN INCHES. |      |      |      |      |      |      |
|---------|----------------------|------|------|------|------|------|------|
|         | 1                    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4    |
| A       | 4.18                 | 4.33 | 4.35 | 4.33 | 4.28 | 4.28 | 4.32 |
| B       | 4.35                 | 4.18 | 4.56 | 4.62 | 4.68 | 4.63 | 4.53 |
| C       | 4.22                 | 4.30 | 4.32 | 4.32 | 4.33 | 4.37 | 4.33 |
| D       | 4.13                 | 4.18 | 4.31 | 4.30 | 4.20 | 4.27 | 4.22 |
| E       | 4.22                 | 4.30 | 4.37 | 4.35 | 4.40 | 4.37 | 4.12 |
| F       | 4.41                 | 4.47 | 4.57 | 4.65 | 4.63 | 4.63 | 4.50 |
| Average | 4.25                 | 4.35 | 4.41 | 4.41 | 4.42 | 4.42 | 4.38 |

The vertical column averages show the greatest variation to be 8 per cent., and show considerable carelessness in manufacture. The horizontal column averages show that at 1 in. pressure the burners passed 6.25 per cent., and at 3 in. of pressure 10.5 per cent. more gas than they were marked to do. They also show that the regulating apparatus came somewhat slowly into action, but that for pressures of 1½ in. and upwards it was near perfect as can be expected; the variation from the average not exceeding 1 per cent. on either side.

*Experiment 6.*—Burner used was a 6-ft. household regulator burner with a regulating apparatus.

|         | PRESSURES IN INCHES. |      |      |      |      |      |      |
|---------|----------------------|------|------|------|------|------|------|
|         | 1                    | 1.5  | 2    | 2.5  | 3    | 3.5  | 4    |
| A       | 6.57                 | 6.00 | 6.70 | 6.57 | 6.27 | 6.17 | 5.67 |
| B       | 6.37                 | 6.00 | 6.65 | 6.63 | 6.57 | 6.30 | 6.10 |
| C       | 6.18                 | 6.51 | 6.82 | 6.78 | 6.51 | 6.55 | 6.46 |
| D       | 6.16                 | 6.11 | 6.62 | 6.50 | 6.30 | 6.31 | 5.90 |
| E       | 6.27                 | 6.51 | 6.83 | 6.71 | 6.60 | 6.51 | 6.15 |
| F       | 6.26                 | 6.30 | 6.55 | 6.62 | 6.37 | 6.23 | 5.80 |
| Average | 6.34                 | 6.48 | 6.63 | 6.61 | 6.44 | 6.34 | 6.00 |

The vertical column averages show the greatest variation to be 3.4 per cent. The horizontal column averages show that at 1 in. pressure the burner passed 5.7 per cent., and at 2.5 in. of pressure 10.7 per cent. more gas than they are marked to do.

A number of other experiments were made, but they do not present new features, except the one which tested the burners to discover the pressures at which the regulators came into action. None of the regulators came fully into action at a pressure below six-tenths of an inch, and most of them at eight-tenths. The net result of the experiments given is that regulator gas-burners can be made which will not vary in their consumption of gas at pressures varying from 1 in. to 4 in. more or 1.15 per cent. fast and 2.3 per cent. slow of

\* A Paper by Mr. Geo. R. Strachan, Assoc.-M. Inst. C.E., Surveyor to the Vestry of Chelsea, read at the annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, recently held in London, as previously mentioned (see *Builder*, p. 45, ante).



their average consumption. All that is necessary therefore is to get the regulator accurately set, and its limits of error are known. The Metropolitan Gas Act, 1859, defines a meter as correct which does not register more than 2 per cent. fast and 3 per cent. slow. The gas-meter tests given herein show that regulator gas-burners can be made as correct as gas-meters.

The question now arises, Do regulator gas-burners in use on public lamps, where exposed to all weathers, temperatures, and barometric pressures, give equal results to those found in the testing-room? The writer is honoured by Mr. Philip Monson, the gas superintendent for the parish of Kensington, placing at his disposal the results of the average meter system for eleven years. Each lamp has a regulator burner set to burn 4.5 cubic feet per hour. The meters are read each month, and the records have been carefully collected. More than 4,000 lamps are in lighting on the meter system. The following table shows the average consumption per lamp per hour for each of the eleven years.

|          |       |                               |
|----------|-------|-------------------------------|
| 1877     | 4.55  | cubic feet per lamp per hour. |
| 1878     | 4.57  | " " "                         |
| 1879     | 4.50  | " " "                         |
| 1880     | 4.43  | " " "                         |
| 1881     | 4.18  | " " "                         |
| 1882     | 4.50  | " " "                         |
| 1883     | 4.48  | " " "                         |
| 1884     | 4.40  | " " "                         |
| 1885     | 4.40  | " " "                         |
| 1886     | 4.52  | " " "                         |
| 1887     | 4.54  | " " "                         |
| 11/49-53 | "     | " " "                         |
| Average  | 4.503 | " " "                         |

These results are a convincing proof that regulator gas-burners may be relied upon in actual use. The writer has compiled the following table from Mr. Monson's records, showing the average consumption per lamp per hour for each month of the eleven years:—

|           |       |                               |
|-----------|-------|-------------------------------|
| January   | 4.38  | cubic feet per lamp per hour. |
| February  | 4.51  | " " "                         |
| March     | 4.45  | " " "                         |
| April     | 4.53  | " " "                         |
| May       | 4.49  | " " "                         |
| June      | 4.61  | " " "                         |
| July      | 4.60  | " " "                         |
| August    | 4.53  | " " "                         |
| September | 4.53  | " " "                         |
| October   | 4.49  | " " "                         |
| November  | 4.50  | " " "                         |
| December  | 4.39  | " " "                         |
| 12/54-61  | "     | " " "                         |
| Average   | 4.501 | " " "                         |

It will be noticed from this table that the lowest consumption occurs during those months when the hours of lighting are longest, and that this gives an advantage to the local authority if the average meter system is adopted. The following table, based on 4,300 hours' lighting per year, shows the amount of this error:—

| Month.      | Hours of Lighting | Cubic Feet per Hour. | Total Cubic Feet per Lamp. |
|-------------|-------------------|----------------------|----------------------------|
| January     | 484.03            | 4.38                 | 2120.0514                  |
| February    | 427.5             | 4.51                 | 1788.825                   |
| March       | 375.58            | 4.45                 | 1671.3310                  |
| April       | 303.90            | 4.53                 | 1376.6670                  |
| May         | 290.11            | 4.49                 | 1298.2409                  |
| June        | 224.53            | 4.61                 | 1035.0372                  |
| July        | 246.30            | 4.60                 | 1132.9800                  |
| August      | 204.01            | 4.53                 | 926.3653                   |
| September   | 341.90            | 4.53                 | 1548.6070                  |
| October     | 414.57            | 4.49                 | 1861.8033                  |
| November    | 454.95            | 4.50                 | 2047.2750                  |
| December    | 501.98            | 4.39                 | 2203.6922                  |
| Totals, &c. | 4300.00           | 4.50                 | 19,292.6678                |

If the consumption had been taken from the burners alone, it would have stood at 4300 x 4.5 = 19,350 cubic feet per lamp per year, as against 19,292.6678 cubic feet given by the meters, or an error in favour of the gas company of 57.3 cubic feet per lamp per year. In London the price of gas to public lamps north of the Thames is 2s. 2d. per 1,000 cubic feet, so that the saving to the local authority for gas by the average meter system is 1½d. per lamp per year.

Against this there is the cost of the average meter system. The following figures refer to a district containing 4,000 lamps with a meter to every 20 lamps.

| Capital Expenditure.                                                  |       |       |
|-----------------------------------------------------------------------|-------|-------|
| 200 meters fixed complete at 7½ 10s. each                             | £.    | s. d. |
|                                                                       | 1,500 | 0 0   |
| Annual Expenses.                                                      |       |       |
| Interest, depreciation, and repairs on meters, 10 per cent. on 1,500. | 150   | 0 0   |
| Man's time reading meters: 12 weeks per year at 25s. per week         | 15    | 0 0   |
|                                                                       | 165   | 0 0   |

This cost, divided over 4,000 lamps, equals 9.9d. per lamp per year, which is incurred to save 1.5d. per lamp per year.

The figures given refer to a district where the minimum parliamentary limits of pressure are ten-tenths from sunset to midnight, and six-tenths from midnight to sunrise. As a matter of fact, however, the actual pressures are in excess of these limits. From the continuous recording pressure-gauge in the testing-room at Chelsea, it is found that the pressure does not get below 1.2 in. at any part of the day, and that from one hour before sunset to half an hour after, the pressure rises to 3 in., and even more, and then gradually falls to 1.4 in. by midnight. Where pressures like these are given, the writer is of opinion that the average meter system is an unnecessary check and expense. It may be that in small districts the pressures fall below those stated as the parliamentary limits, and in such cases the regulator burners will not pass their full quantity. The remedy, however, is to make the gas company give a proper pressure, and so save the expense of the meters.

# THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION:

## FURTHER EVIDENCE.\*

SIR JOSEPH BAZALGETTE, further examined, said that the granite for the Thames Embankment came from various quarries, in none of which had he, nor any member of his family, the slightest pecuniary interest. There was a Royal Commission a few years ago upon the question of the mode of dealing with the London sewage. The Commission reported that the deodorising of the river by pouring chemicals into the sewage was only a temporary palliative. The Board was now erecting new works at the Barking and Crossness outfalls, which were intended to carry out the first part of the recommendations of the Royal Commission. The Royal Commission were of opinion that when the solid matter was precipitated the effluent would not be pure enough to go into the river without being passed through land. But the Board were now carrying out the first part of the Royal Commission's recommendations, in the hope that it might be successful, or that some cheaper mode of producing a purer effluent might be found, if necessary, instead of having to purchase the very large area of land that would be required for filtering the water. The sludge was to be taken away right out to sea in specially-constructed ships, and there discharged; but the Board were fully alive to the advantage that might be gained if it were possible to produce a deposit which could be sold and used as manure. But they were not very sanguine of being able to do that. Asked by Mr. Bosanquet as to the cost per annum of the chemicals used by the Board for the deodorisation of the sewage, Sir Joseph Bazalgette replied that one year the Board spent 80,000l. in chemicals, but that was during a very hot season, when there were very great complaints of the state of the river. They were then using manganate of soda, and that was simply to arrest the decomposition, and not for the purpose of removing the sludge. In answer to the Chairman, the witness said that the contracts for the chemicals were made with various firms. That was a matter mainly in the hands of the Chemist of the Board, but he (witness) was jointly responsible with that officer. When they began they had to pay about 40s. per ton for manganate of soda, but they set to work and manufactured it themselves at a very greatly reduced cost, and brought the price down in the market very largely, until, at last, the manufacturers supplied it to them at a lower rate than they could produce it at for themselves. He believed the Board was now paying about 14s. per ton for it instead of 40s. as formerly. Examined by Mr. Bosanquet, witness said the Board had not been spending so much as 80,000l. a year for chemicals; the year to which those figures pertained was an exceptional one. This year there had been a wet and cold season, and the Board had done very little with the chemicals; in fact, they had now stopped it. Sir Henry Roscoe was now the advising Chemist of the Board, and under his advice the use of chemicals had lately been stopped. In answer to the Chairman, witness said that Sir Henry Roscoe had not advised a

permanent stopping of the use of chemicals, but he was watching the state of the river from day to day, and would vary his order if necessity arose. Asked by the Chairman as to the Board's procedure in regard to the provision of bridges, tunnels, or ferries across the river below London Bridge, Sir Joseph Bazalgette said it was in the year 1882 that he was instructed to report generally upon the question of communications across the Thames below London Bridge. In his report he pointed out that whilst there were twelve bridges above London Bridge, and three-fifths of the population in immediate communication with those bridges, the other two-fifths of the population living on the river sides below London Bridge had no communication across the Thames. The twelve bridges referred to cost altogether about 6,500,000l., and the people below bridge had contributed towards that cost. It was thought reasonable, therefore, that they should have proper communications across the river provided for them. Witness, in his report to the Board on the subject, recommended three points of crossing, the first at the Tower, the second at Shadwell, and the third at Blackwall. The two latter points, Shadwell and Blackwall, were chosen because they were the only two points at which the river could be crossed without coming in contact with docks on one side or the other. The Corporation of London were now constructing a bridge at the Tower, and the Metropolitan Board of Works were just about to commence the tunnel at Blackwall. The Greenwich Subway was quite a different project to the Blackwall Tunnel. The Greenwich Subway was a subway for which private parties got an Act about the year 1883. They proposed to the Metropolitan Board of Works that they should take that subway, and they would construct it on payment of a sum of 126,000l. That subway was to be 10 ft. in diameter, with inclines of 1 in 12 at each end, and steps to get up to the shore. That would have been a very useful subway for workmen to get across, but as a public means of communication it would be quite inadequate. The Company then proposed to the Board that they should add to that another subway, which would have a roadway 17 ft. wide, upon the Board paying the sum of 400,000l., but it was so situated that the approaches could not be made to it, and it was to have hydraulic lifts at each end. The cost of working these hydraulic lifts, with a very moderate amount of traffic, was put at 3,000l. per year, but they would cost a great deal more. The Board were going to construct a tunnel, or rather, three tunnels, at Blackwall, which, instead of giving 17 ft. and 8 ft., making together 25 ft., would give 50 ft., made up of two 18 ft. 6 in. roadways and a 13 ft. roadway. This series of tunnels would have good approaches from Woolwich and Greenwich on the one side of the river, and from East India Dock-road and the East India Docks on the other. The gradients would be 1 in 40. The estimated cost of this work was from 1,250,000l. to 1,500,000l. In answer to Mr. Freeman, one of the counsel representing the Board, Sir Joseph Bazalgette said that there was very considerable difficulty to be encountered in constructing the tunnel, which passed through treacherous ground and water. They intended to do it by pneumatic pressure. They proposed to construct the smaller tunnel first, in one contract, with approaches, at a probable cost of 200,000l. They thought they should learn then better how to do it. The contract had not yet been entered into for this work, but some of the land required had been purchased. Questioned by Mr. Bosanquet, witness said that for all works tenders were invited by advertisement. Anybody might tender for any of the Board's works. All tenders were opened at the Board by the Chairman, and not by witness or any other official. Nothing had yet been done with respect to the proposed Shadwell subway.

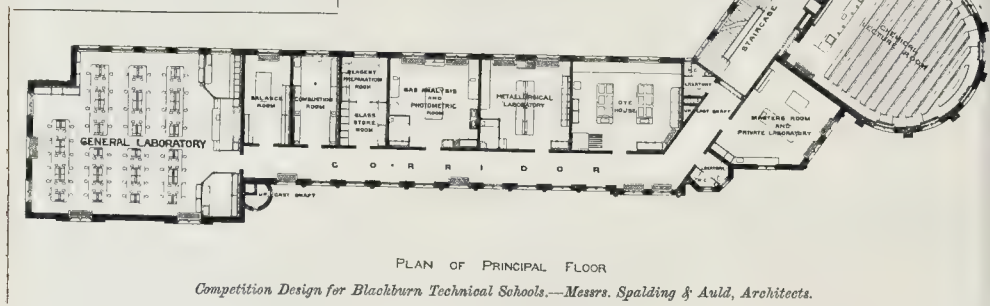
Mr. Matthew Goddard, re-called, gave some further evidence as to transactions between himself and the occupiers of some of the Board's public-houses.

Mr. Horace Gundry, F.R.I.B.A., District Surveyor for Paddington, deposed that in March, 1875, he made a report to the Board with reference to a building which was being erected in his district, viz., "Whiteley's," in Queen's-road, Bayswater. His report was addressed to Mr. Vulliamy, and drew attention to the fact that the warehouse in question contained about a million cubic feet, and that, as far as could be ascertained, the builder (Mr.

\* For summary of previous evidence see the Builder, pp. 8, 44, 60, 83, ante.



Thomas Elkington) had no intention of subdividing the building, according to Section 27, Rule 4, of the Building Act, which read as follows:—"Any warehouse or other building, used either wholly or in part for the purpose of trade or manufacture, containing more than 216,000 cubic feet, shall be divided by party-walls in such manner that the contents of each division shall not exceed the above-mentioned number of cubic feet." On the 15th of March, 1875, witness received the following letter from Mr. Vulliamy, the late Superintending Architect of the Board:—"Dear Sir,—With reference to the building in Queen's-road, Bayswater, which, I presume, is Mr. Whiteley's premises, you are, in my opinion, quite right to be exact in your proceedings, as you will have to be guided not only by the size of the building, but by the use to which it is applied. A warehouse is defined in the Schedule as to the walls of such buildings, and the terms of the 27th section refer to 'warehouse or other building.' The word 'other' here means, according to the courts and the lawyers, a building similar to a warehouse, not as the



PLAN OF PRINCIPAL FLOOR  
Competition Design for Blackburn Technical Schools.—Messrs. Spalding & Auld, Architects.

sense might be if the word 'any' had been substituted. It takes a general meaning. The same rule applies to section 56." The Chairman (Lord Herschell) said he did not know whose law that was, because the words were "any warehouse or other building used either wholly or in part for the purpose of trade or manufacture." He did not know that a building used for the purpose of a manufactory could be *ejusdem generis* with a warehouse; he should think it could not be possible; it was another *genus* altogether. Further correspondence between the witness and Mr. Vulliamy was read, and ultimately the witness saw Mr. Vulliamy on the subject of taking proceedings against the contractor, as the building was being covered in. The matter had previously been referred to the Building Act Committee for consideration and report. Witness was anxious to commence proceedings against the builder as early as possible, so that the builder might not complain that he had been led into unnecessary expense by being allowed to go on so long. Mr. Vulliamy said it would be a very awkward thing to commence proceedings while the matter was under the consideration of the Board, and that such a course would not be respectful to the Board. Mr. Saunders, then a member of the Board, was Mr. Whiteley's architect, and Mr. Whiteley's solicitor was Mr. Roche, then also a member of the Board. Witness said that although the builder, in the usual notice, called the proposed building "a warehouse for furniture," it was endorsed at the back "I am instructed by my client that this building is to be used as a furniture shop for sale by retail, as in his other establishments. J. Ebenezer Saunders." Witness did not know whether Mr. Saunders was at that time a member of the Building Act Committee of the Board.

We must break off here.

**Proposed Cathedral in New York.**—It is stated in the newspapers that several of the most eminent American architects have been invited by the trustees of the proposed cathedral to submit plans for an edifice "which shall be the largest, costliest, and most enduring church structure in the United States." The cathedral, to be dedicated to St. John the Divine, will be built on land near the Hudson River. The exterior is to be of marble or granite, and "no inflammable material is to be used in its construction."

#### COMPETITIONS.

**Church and Mission Hall, Kensal Town.**—We understand that the design of Messrs. Denaine & Brierley, architects, York, has been selected for a new church and mission-hall for the newly-formed parish of St. Thomas, Kensal Town. The estimated cost is 5,500*l*. Five London architects were also invited, and submitted designs.

**Institute and Gymnasium, Buckingham Palace-road.**—We are informed that in the limited competition for the Buckingham Palace-road Institute, Gymnasium, lecture and music-rooms, &c., a professional assessor selected plans by Mr. Edward Francis C. Clarke, of Westminster-chambers, who was accordingly appointed architect to the buildings.

#### Illustrations.

##### MEMORIAL STATUE OF THE LATE CARDINAL GIRAUD.

**HIS** statue, of which we give an illustration, is from the chisel of the eminent French sculptor, M. Crank: it is executed in marble, and is to be erected in the Cathedral of Cambrai, as a memorial of the late Cardinal Giraud, who was also, we believe, Archbishop of Cambrai.

The statue was exhibited in the Paris *Salon* of this year, and was referred to in our article on the *Salon* as one of the prominent works of the year.

##### THE WALLACE STATUE, ABERDEEN.

We give an illustration of this work, which has been carried out by the aid of a bequest of £3,000 left for the purpose by the late Sir John Steel, the sculptor, of Edinburgh. Twenty-five sculptors sent in models in competition for the work, and the trustees, with the co-operation of Sir Noel Paton and Dr. Rowand Anderson, selected the one by Mr. W. Grant Stevenson, by whom it was modelled to a large scale, and cast in bronze by Messrs. Young & Co., of Pimlico. The statue is colossal in scale, standing 16 ft. in height, on a pedestal of rough rusticated stonework, or rather rock-work.

The statue was unveiled on June 29 by the Marquis of Lorne.

##### COMPETITION DESIGN FOR BLACKBURN TECHNICAL SCHOOLS.

This design, of which we give the perspective view and plan, was the one sent in under the motto "Progress," and referred to by us in our review of the designs as one possessed of very high merits, and which to us seemed to have been unduly overlooked. The authors are Messrs. Spalding & Auld. They claim that the plan is one that would utilise the site to the best advantage; "the position is such that nothing could be gained by setting back the building; on the contrary, a good corner affords opportunity for picturesque treatment."

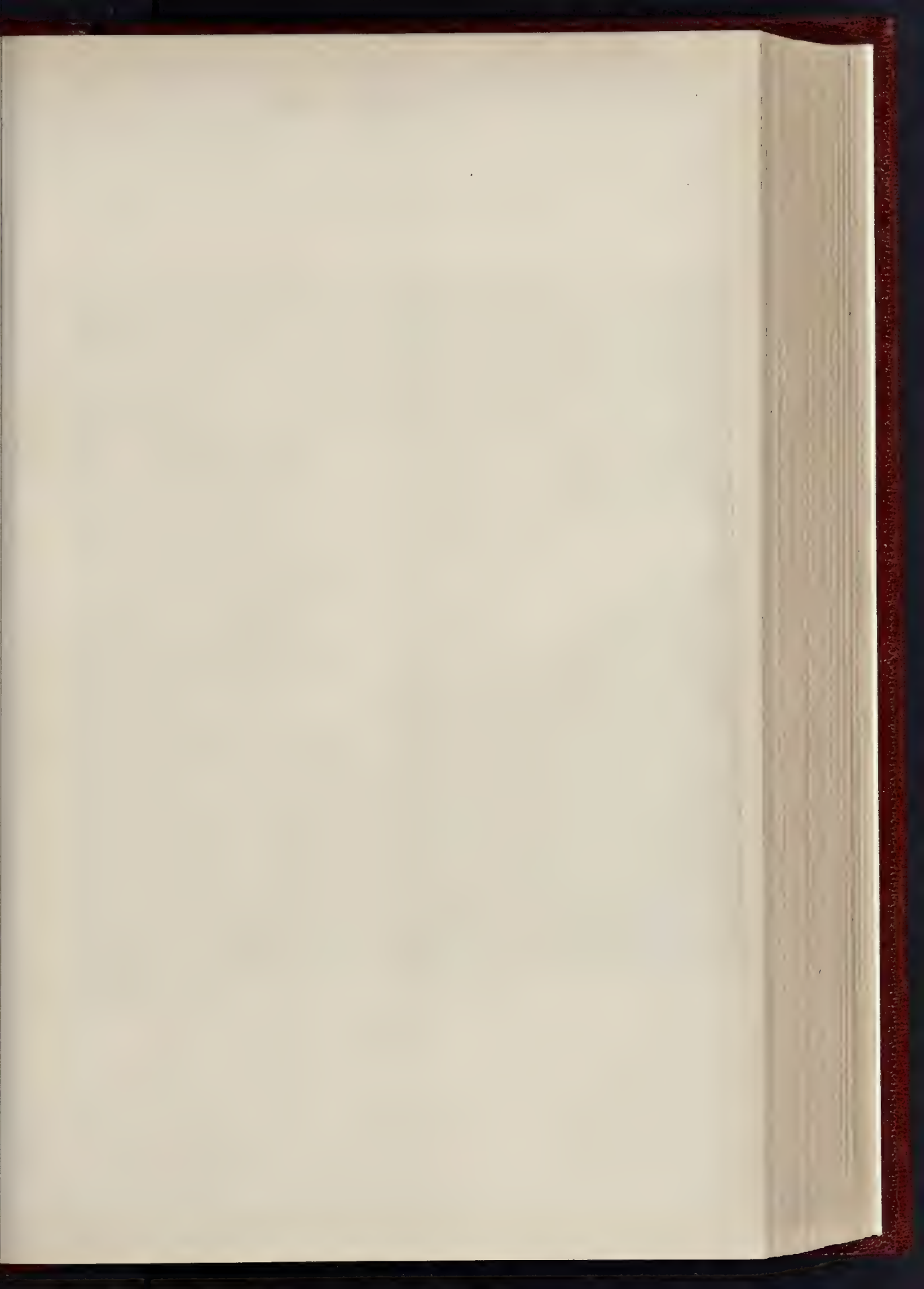
The method of placing the corridor on the south of each wing, instead of running it symmetrically round, shows a consideration of the best conditions of lighting for rooms in which continuous work is to be done, which is, we regret to say, by no means usual in competition designs, as observed in our notice of another competition in the present number.

The authors make a comment on the recent not un-frequent practice of issuing an assessor's "sketch plan" with instructions to competitors, which seems not uncalled for. They say:—

"In this, as in many recent competitions under an assessor, an assessor's sketch plan has been issued with the 'Instructions and Conditions of Competition.' Naturally, a large proportion of the competitors in such cases at once adopt the plan suggested. It 'flatters' the assessor and saves them the trouble of working out a plan of their own. The system, however, places at a great disadvantage any independent effort to bring out all the possibilities of the site when the results have to be submitted to one having preconceived ideas on the subject."

It is a fact that in this case the assessor, in his report, remarked that he was "flattered" that so many of the competitors had adopted his idea as to the plan, and he gave the first premium to a design based on his general idea of the plan. This is quite natural: the assessor's sketch plan is sent forth as the principle of arrangement which he thinks the best, and it is not unlikely that he should continue to retain this opinion. But it is, as Messrs. Spalding & Auld say, rather unfairly handicapping the competitors who have an original idea of their own, and it is a question whether the "assessor's sketch plan" is altogether a wise institution.



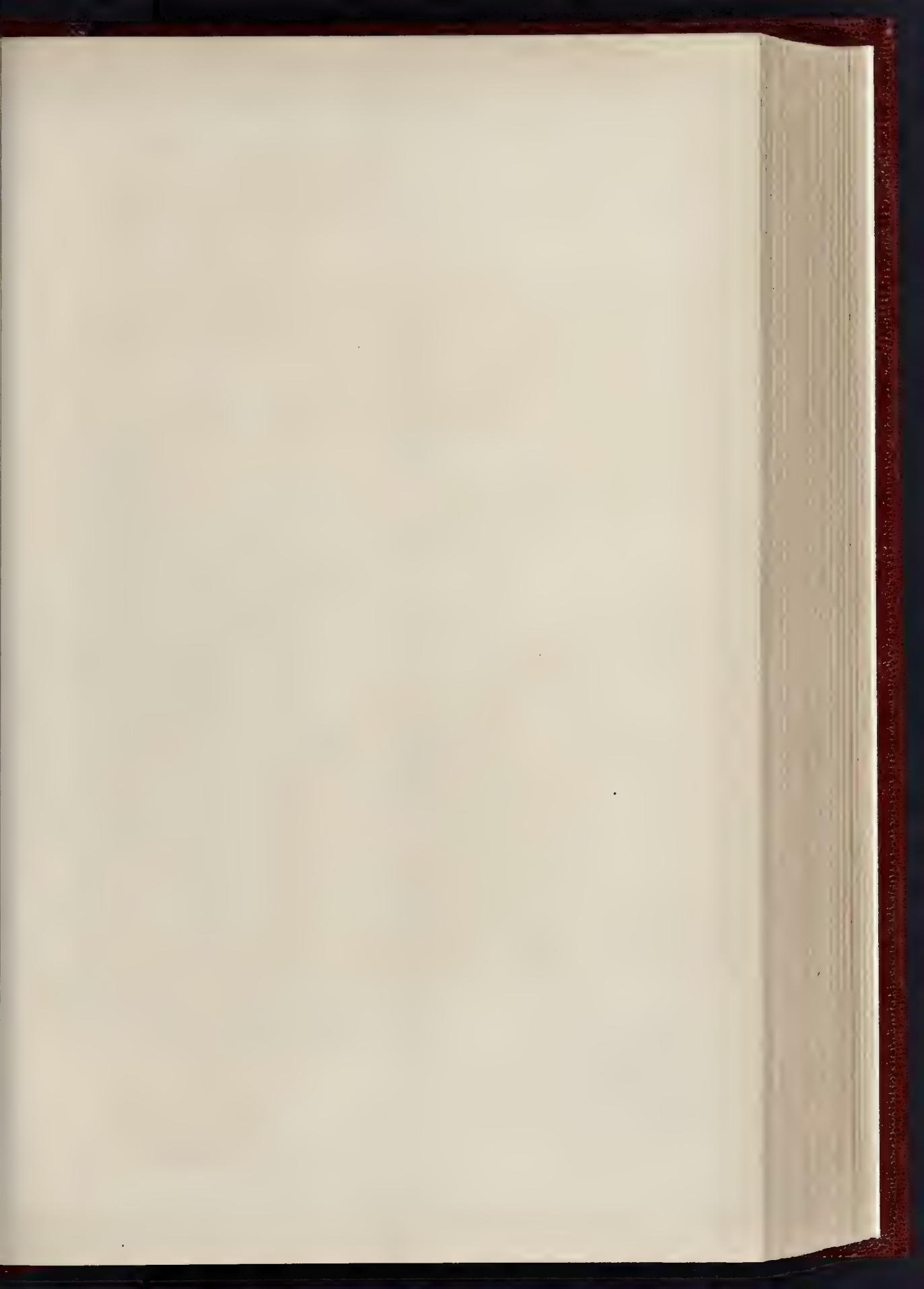




MEMORIAL STATUE OF THE LATE CARDINAL GIRAUD, FOR THE  
CATHEDRAL OF CAMBRAL. M. CRANK, SCULPTOR.

The Phototype Co., 358, Strand, London.

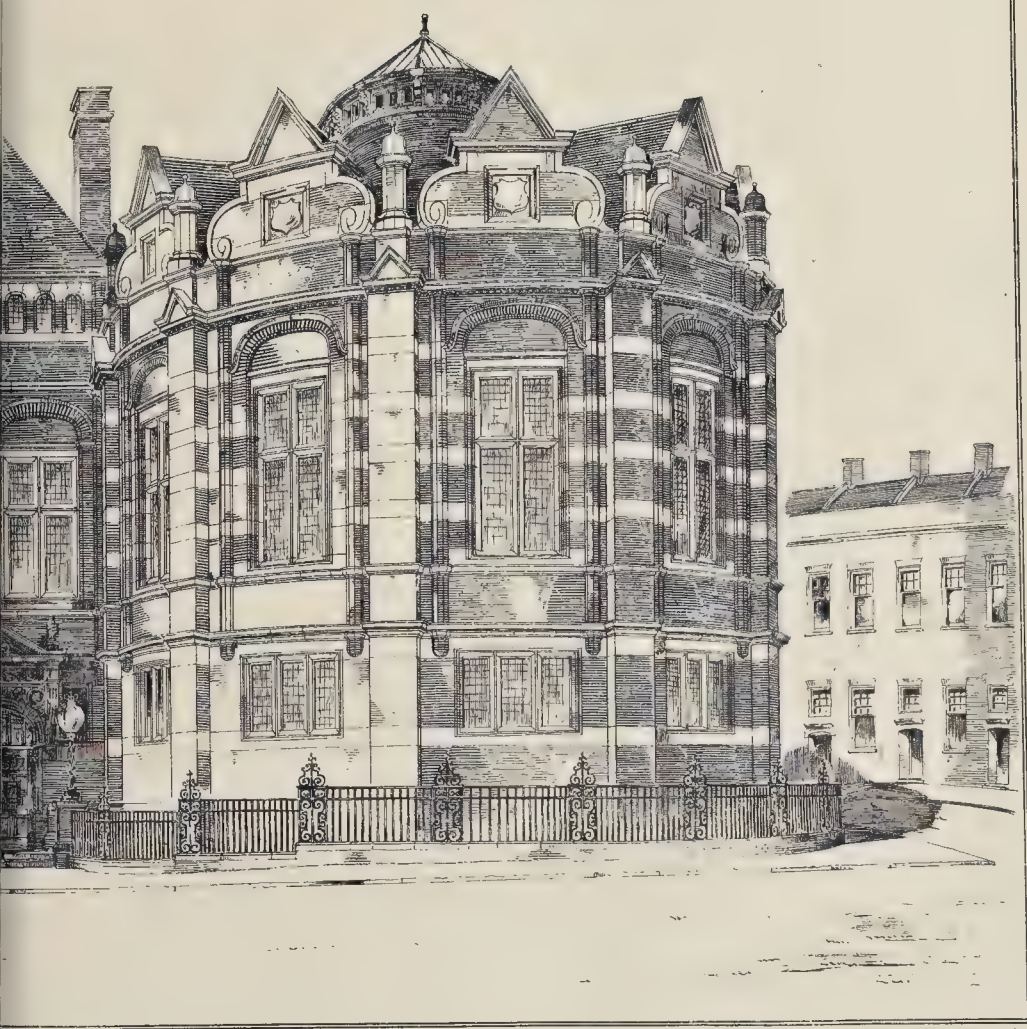






COMPETITION DESIGN FOR BLACKBURN TOWN HALL



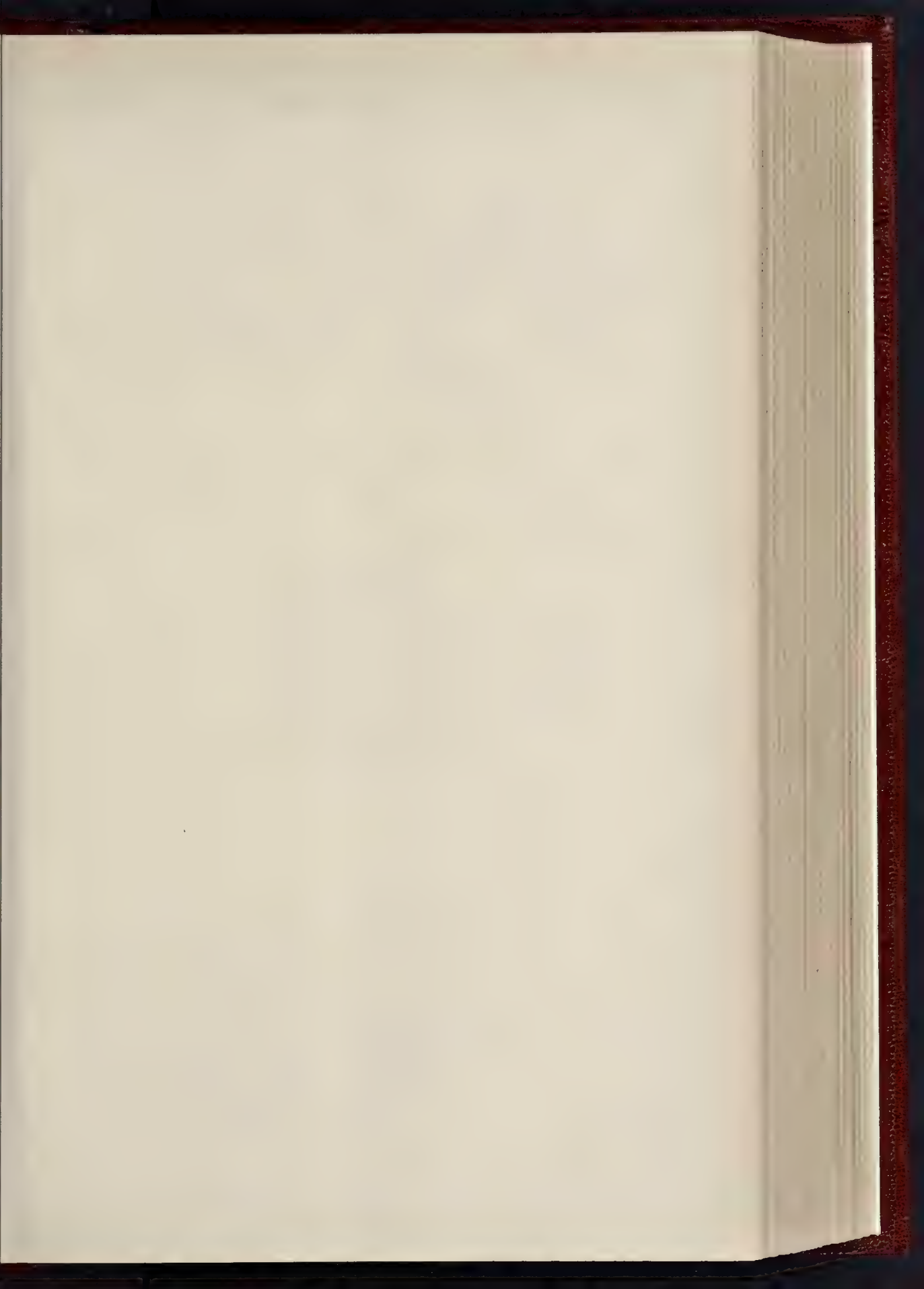


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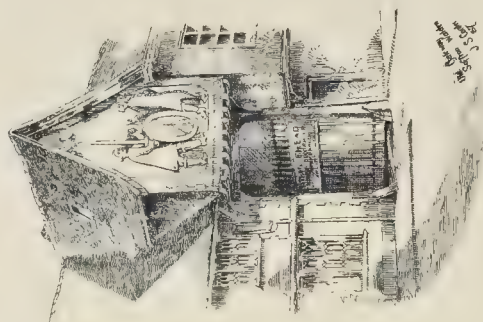
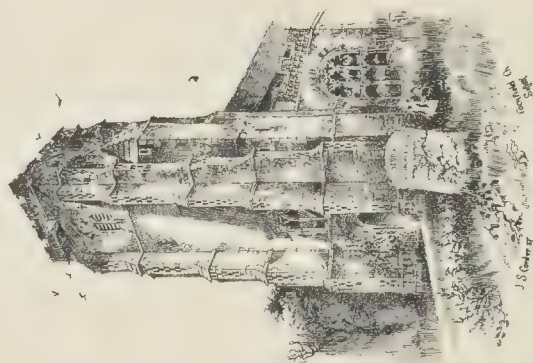
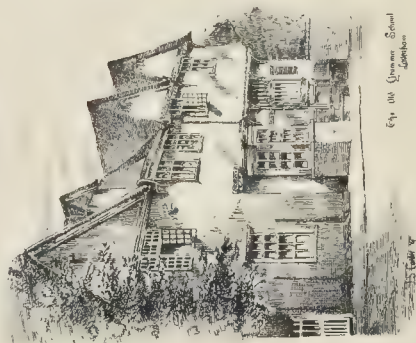
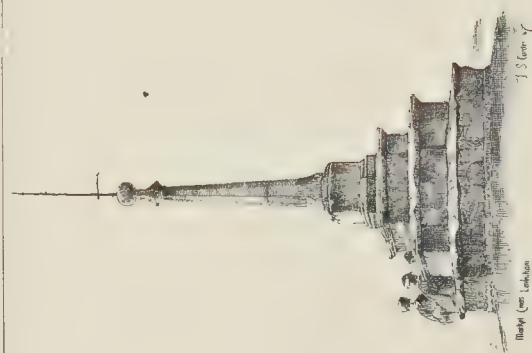
SCHOOL.—MESSRS. SPALDING AND AULD, ARCHITECTS.





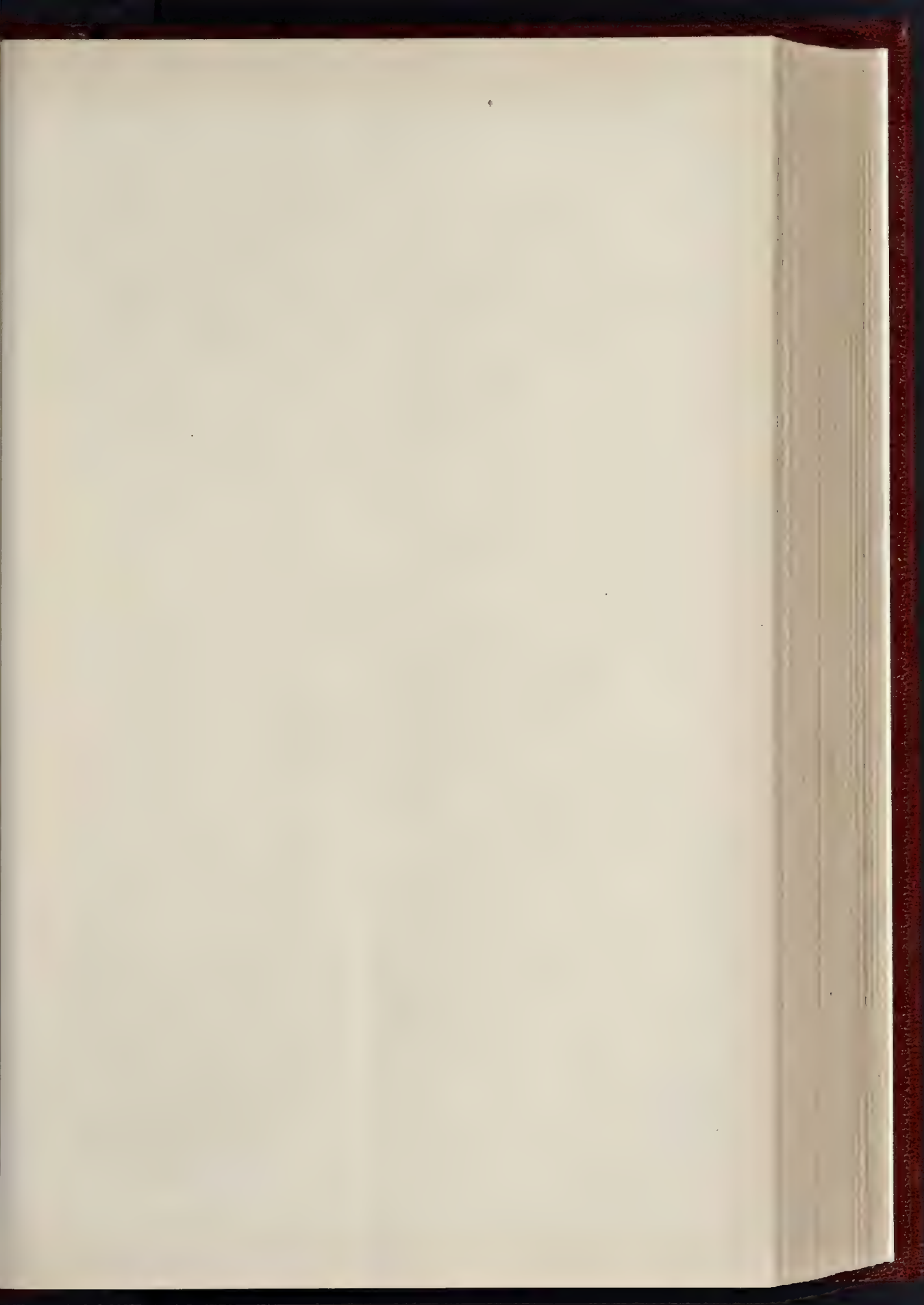


THE BUILDER, AUGUST 11, 1888.



"WASSIE NOTES" in East Anglia  
from  
An Architects Sketch Book





THE BUILDER AUGUST 11, 1888.







NEW DURNING LIBRARY, LOWER KENNINGTON LANE.—MR. SIDNEY R. J. SMITH, A.R.I.B.A., ARCHITECT.





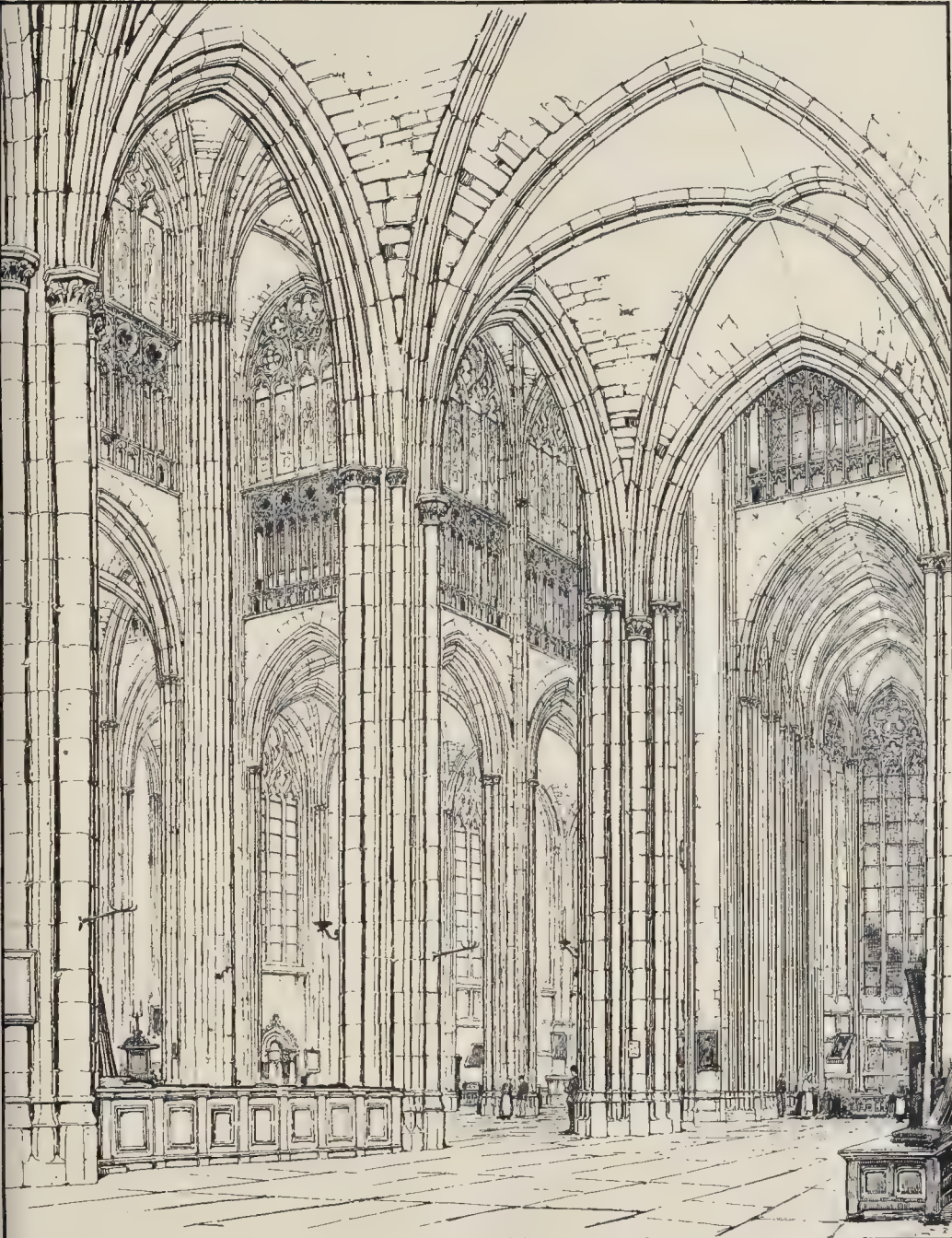


PHOTO. THO. SPRAGUE & CO. 22 MARTIN LANE, LONDON, E.C.

VIEW IN ST. OUEN, ROUEN.—FROM A DRAWING BY MR. F. WILLIAMSON







THE WALLACE STATUE, ABERDEEN.  
MR. W. GRANT STEVENSON, SCULPTOR.

The Phototype Co., 308, Strand, London.





HOUSES, Nos. 7 to 11, CHEYNE WALK, CHELSEA.

THESE houses occupy the site of some old and historical houses built on the site of the "Great Garden" of Winchester House, forming part of the Manor House (Henry VIII.'s Palace) of which this building was a continuation, fully described in the "Village of Palaces," by L'Estrange. The houses, seven in all, and one of which was well known as the Gothic House, it having been altered and remodelled by the elder Pugin, had for the most part fallen into decay, and, the leases having expired, it was decided to rebuild according to modern requirements.

A reference to the plans of these new houses will show that an innovation has been made in the arrangement of the ordinary London back-addition house. This improvement is chiefly confined to the ground-floor, and consists in the mode of arranging hall, staircase, entrance, and two rooms.

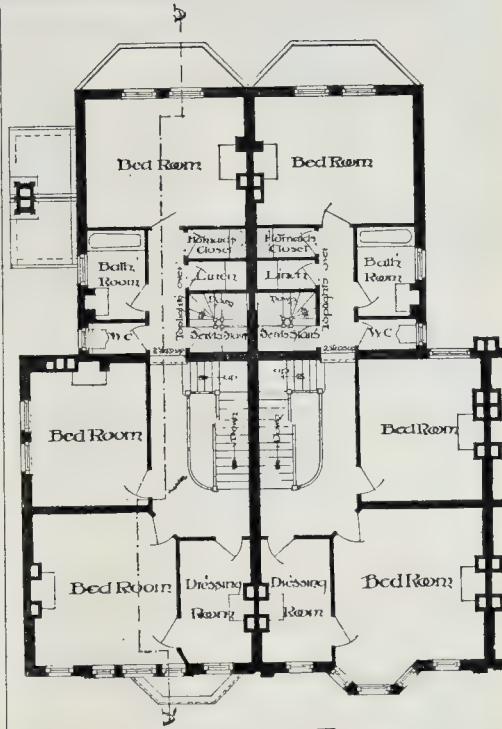
The ground-floor consists of morning-room or library, and a dining-room; between these two rooms is placed a large inner hall and staircase, the staircase being placed on the opposite side and out of the view of the front entrance. The staircase from ground to first floor consists of three easy flights, under which is formed a serving-room, with doors communicating to the two rooms, and a way down to the basement. A lift is also provided from kitchen to second floor, has also been provided. The first floor consists of front and back drawing-room and billiard-room or boudoir. The second and upper floors contain eleven bed-rooms, with dressing and bath-rooms, &c. The accommodation in the basement is very ample, and all rooms, staircases, and passages are thoroughly well lighted and ventilated. Externally the houses are faced with red-bricks, the general treatment being simple, so as to harmonise with the adjoining houses, which are very good specimens of the architecture of their day.

F. HEMINGS.

NEW DURNING LIBRARY, LOWER KENNINGTON-LANE, LAMBETH.

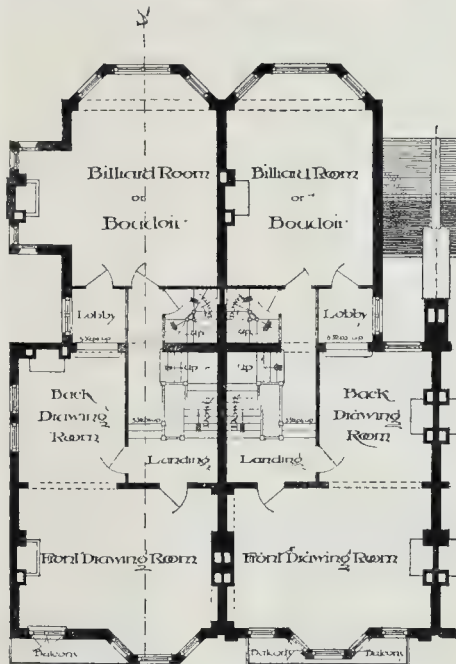
THIS is one of the new free libraries which are being built for the parish of Lambeth, for the Lambeth Libraries Commissioners, from the designs of their architect, Mr. Sidney R. J. Smith.\* The whole cost of the building and site (about 10,000*l.*) has been defrayed by Miss J. Durning Smith. The front of the building will be constructed with red Fareham bricks and Portland stone, with

\* For illustrations and descriptions of two other of the Lambeth Free Libraries, those, namely, at Norwood and in the South Lambeth-road, see the *Builder* for Sept. 24 and Dec. 17, 1887, respectively.



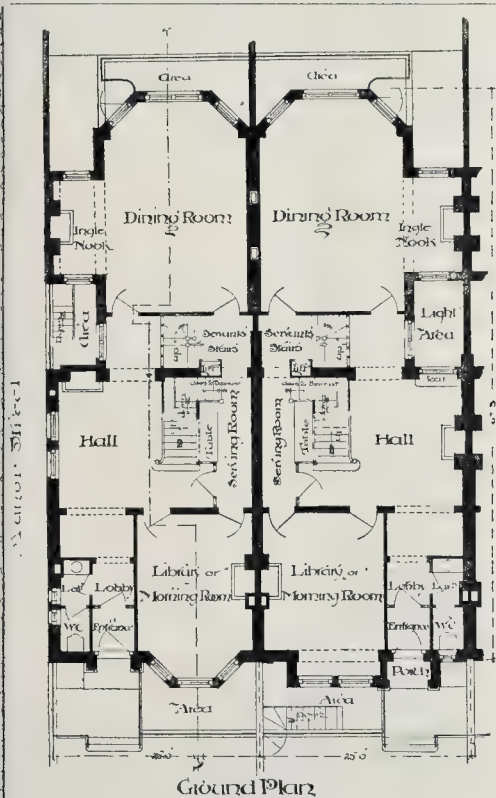
Second Floor Plan

Scale of Feet



First Floor Plan

Scale of Feet



Ground Plan

Scale of Feet

Plans of Houses, Cheyne Walk, Chelsea.—Mr. F. Hemings, Architect.

granite columns to the porch and lead glazing in windows, several of the architectural features being in Stiff & Sons' terra-cotta, with green slates to roof and timber-work in upper portion of tower. The public rooms will have brick facings inside, with ornamental coloured glazed bricks, and with open-timbered roofs; the basement has a large book-store, heating-chamber, and coal-store; while the front building over has a good dwelling-house for the Librarian, and with committee-room on first floor. There is accommodation for a large number of books in the lending-library, and the shelves will be adjustable to any sized book. Cotgrave's indicator will be used to show what books are available.

The contractors are Messrs. Hall, Beddall, & Co., of Pitfield Wharf, Waterloo Bridge.

#### WAYSIDE NOTES IN EAST ANGLIA.

THE illustrations thus entitled are reproduced from the sketch-book of Mr. J. S. Corder, architect, of Ipswich, who sends the following remarks as supplementary to them:—

"Lavenham is a quaint old town ten miles south of Bury St. Edmunds. It abounds in old Tudor half-timbered houses, many of them comparatively untouched, and is a happy hunting-ground for the artist and architect. It was a place of no mean importance in the fifteenth and sixteenth centuries, being a great centre of the wool trade, and under the immediate protection of the De Veres, the powerful Earls of Oxford, who had a seat at the Hall. The town possessed three Guildhalls, one of which, founded by John, the fifteenth Earl of Oxford, in 1529, and dedicated to Corpus Christi, was recently illustrated in these pages.\* It is one of the most striking buildings of the kind in East Anglia, and is now undergoing restoration. The church is extremely fine, and owes a great deal of its magnificence to the De Veres, and also to the generosity of the early Flemish settlers, who introduced manufactures to the place. It is built of Casterton stone and flint. The tower rises to a height of 141 ft., and is well proportioned.

The old Grammar School, formerly, no doubt, the residence of a wealthy trader, is an extremely picturesque building, but it has suffered much by time and the energy of its renovators. The upper part is ornamented with plaster designs, in which the mitre and fleur-de-lis figure conspicuously. The interior contains a fine mantelpiece and some carved beams of great beauty.

The Cross stands in the centre of the market-place, and is in a very fair state of preservation. Cockfield is a pleasantly-situated village, three miles from Lavenham on the Bury road. The church tower shows up well from the rail, as it stands upon rising ground. It is well buttressed, the buttresses on the east side coming right down into the church. There is a fine monument inside the church to the Harvey family, and some of the windows have good fragments of stained glass in them.

There are indications of a Roman encampment in the neighbourhood.

Rayleigh is an ancient town seven miles north-west of Southend. The tower of the church is stone, a peculiarity in this county confined to churches lying near the Thames. There is a fine canopied altar tomb in the south aisle in the Decorated style. At the upper end of the town are earthworks, the remains of a castle first built by Sweyn, who owned the place at the Domesday survey.

Saffron Walden abounds in old houses of sixteenth-century date, and possesses a very fine church, the spire of which was erected on the old tower in 1831 by Rickman, the well-known Gothic revivalist. The sketch shows the old gateway forming part of what was originally the Sun Inn. The upper part is decorated in boldly-carved plasterwork, and is in a good state, having been recently restored.

JOHN S. CORDER."

#### VIEW IN ST. OUVEN, ROUBEN.

THE sketch which we publish is taken from the south aisle looking east and across the transepts, representing the earlier and finer portion of the interior architecture, belonging to the first half of the fourteenth century.

The illustration is reproduced from a pen sketch by Mr. F. Williamson.

\* See *Builder* for April 28 last.

#### THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS:

##### RECENT VISITS TO WORKS.

IN connexion with the recent annual meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held in London on 12th, 13th, and 14th of last month,\* several visits of interest were made by the members to works in progress and to manufacturing establishments. Of the works in progress, the most notable were the new metropolitan sewage precipitation works at Barking (of which a full description was given in the *Builder* for July 28, p. 60), the new Greenwich Ferry, and the new Battersea Bridge; we give brief descriptions of these works a little further on. The factories and workshops visited included the sanitary works of Mr. George Jennings at Stangate, Lambeth; the works of the Lucigen Light Company, Westminster; and Brin's Oxygen Works, Westminster.

At Mr. George Jennings's busy workshops the members were shown a large variety of sanitary appliances and fittings, including a new spray bath, with valve worked by the foot of the bather; a new flushing-rim slop sink; a new street urinal, circular on plan, with strong stone-ware basin, salt-glazed, in lieu of the usual iron basin; "tip-up and lift-out" lavatory basins, with lock bearings; a spray bath, lavatories, and other fittings, for a new bathing establishment at Barcelona; an arrangement of automatic cistern for charging with disinfecting fluid the water of street watering-vans, or the flushing-water of sewers and house drains;† Jennings and Brewer's electrical apparatus for indicating the level of water or other fluids in reservoirs, sewers, &c.;‡ and a new arrangement of automatic flushing latrine. This patent latrine is emptied and flushed by an ingenious arrangement of induced siphon action at the outlet, which is maintained until the whole contents of the range of pans are completely discharged. The necessary after-flush then enters, and re-fills the pans. The visitors also inspected the brass-finishing and engineering shops, the marble and slate-working departments, the brass-foundry, &c.; and, altogether, the visit was very instructive and interesting. Thanks were tendered to the Messrs. Jennings, Mr. Ellice-Clark, the President, Mr. James Lemon (Southampton), and Mr. J. Gordon (Leicester), making some remarks appropriate to the occasion. Mr. Sidney Jennings spoke in reply.

The works of the Lucigen Light Company were next visited. This light, as Mr. Ellice-Clark explained, is not exactly a new idea, but it is the practical outcome of earlier inventions. The light, it may be first mentioned, is produced by burning creosote oil, tar oil, crude petroleum, or other heavy hydrocarbons, blown in the form of spray by compressed air or steam to the burner. It is claimed that by the use of this invention a light equal to 2,500 candle-power, actual, can be obtained for from 2d. to 3d. per hour, while the cost of the plant is put at only one-fourth of that required for electric lighting. The "Lucigen" light can be used in various forms, portable and otherwise, and with vertical or horizontal flames, as the nature of the work may render necessary. It appears to be admirably adapted and has been already largely used for outdoor work—notably by the contractors for the Forth Bridge, the Barking Outfall new sewage works, &c. It is also coming into extensive use in iron foundries and large engineering and other shops, quarries, docks, and railway-yards. While the light is not so glaring as that of the electric arc-lamp, it is more distributive or diffusive in quality, and does not cast such black shadows as accompany the use of the electric arc-light. It is claimed that the "Lucigen" light gives off neither smoke nor smell, but it certainly (as seen at the Westminster works) throws out great heat, and is rather noisy. In the open-air, or in very large covered areas, these would not be very serious objections, and the light has undoubtedly a prosperous future before it, especially in view of its economy of cost and its portability. As Mr. Ellice-Clark remarked, it is "not exactly" adapted for purposes of domestic lighting, but experiments and trials are being made with an

improved "Lucigen" of much smaller size and lighting power than those hitherto made and used, and it is hoped and believed by the Company that this form of "Lucigen" light will be able to successfully and safely compete with gas or electricity for the lighting of the public streets.

Subsequently a visit was paid to Brin's Oxygen Works at Westminster, a full description of which will be found in *Industries* for October 21, 1887. The following particulars are taken from that journal:—Considerable interest, said our contemporary, has been aroused lately in scientific and industrial circles by a report that separation of the oxygen and nitrogen of the air was being effected on a large scale in London by a process which promises to render the gases available for general application in the arts. The cheap manufacture of the compounds of nitrogen from the gas itself is still a dream of chemical enthusiasts; and though the pure gas is now available, the methods of making its compounds have yet to be devised. But the industrial processes which already depend directly or indirectly on the chemical union of bodies with atmospheric oxygen are innumerable. In all these processes the action of the gas is impeded by the bulky presence of its fellow constituent of air, nitrogen. We may say, for instance, in homely phrase, that whenever a fire burns there are four volumes of nitrogen tending to extinguish it for every volume of oxygen supporting its combustion; and to the same degree the nitrogen interferes with all other processes of atmospheric oxidation, of which most metallurgical operations may be given as instances. If, then, it has become possible to remove this diluent gas simply and cheaply, in order to give the oxygen free play in its various applications, we are doubtless on the eve of a revolution among some of the most extensive and familiar of the world's industries. A series of chemical reactions has long been known by means of which oxygen could be separated out of air in the laboratory; and at various times processes based on these reactions have been patented for the production of oxygen on a large scale. Until recently, however, none of these methods gave sufficiently satisfactory results. The simplest and perhaps the best of them was based on the fact first noticed by Boussingault, that when baryta (BaO) is heated to low redness in a current of air, it takes up oxygen and becomes barium dioxide (BaO<sub>2</sub>), and that this dioxide at a higher temperature is re-converted into free oxygen and baryta, the latter being ready for use again. For many years it was assumed, however, by chemists that this ideally simple reaction was inapplicable on a commercial scale, owing to the gradual loss of power to absorb oxygen which was always found to take place in the baryta after a certain number of operations. About eight years ago Messrs. A. & L. Brin, who had studied chemistry under Boussingault, undertook experiments with the view of determining why the baryta lost its power of absorbing oxygen. They found that it was owing to molecular and physical changes caused in it by impurities in the air used, and by the high temperature employed for decomposing the dioxide. They discovered that by heating the dioxide in a partial vacuum the temperature necessary to drive off its oxygen was much reduced. They also found that by supplying the air to the baryta under a moderate pressure, its absorption of oxygen was greatly assisted. Under these conditions, and by carefully purifying the air before use, they found that it became possible to use the baryta an indefinite number of times. Thus the process became practically, as it was theoretically, continuous. After securing patent protection for their process, Messrs. Brin erected a small producer in Paris, and successfully worked it for nearly three years without finding a renewal of the original charge of baryta once necessary. This producer was exhibited at the Inventions Exhibition in London in 1885. Subsequently an English company was formed, and in the autumn of last year Brin's Oxygen Company began operations in Horseferry-road, Westminster, where a large and complete demonstration plant was erected, and the work commenced of developing the production and application of oxygen in the industrial world. . . . We may indicate a few other of the numerous possible applications of cheap oxygen which might be realised in the near future. The greatest illuminating effect from a given bulk of gas is obtained by mixing it with the requisite

\* See *Builder*, p. 41, ante.

† Described and illustrated in the *Builder* for Jan. 7 last, p. 13.

‡ Described and illustrated in the *Builder* for Sept. 17, 1887, p. 410.



proportion of oxygen, and holding in the flame of the burning mixture a piece of some solid infusible and non-volatile substance, such as lime. This becomes heated to whiteness, and emits an intense light, known as the "Drummond Light," used already for special purposes of illumination. By supplying oxygen in pipes laid by the side of the ordinary gas-mains, it would be possible to fix small Drummond lights in place of the gas-burners now used in houses; this would greatly reduce the consumption of gas and increase the light obtained, or even render possible the employment of cheap non-illuminating combustible gases other than coal-gas for the purpose. Two obstacles at present lie in the way of this consummation,—the cost of the oxygen, and the want of a convenient and completely refractory material to take the place of the lime. Again, the intense heat which the combustion of carbon in cheap oxygen will place at the disposal of the metallurgist cannot fail to play an important part in his operations. There are many processes, too, of metal refining which ought to be facilitated by the use of the gas. Then the production of pure metallic oxides for the manufacture of paints, the bleaching of oils and fats, the reduction of refractory ores of the precious metals on a large scale, the conversion of iron into steel, and numberless other processes familiar to the specialists whose walk is in the byways of applied chemistry, should all profit by the employment of this energetic agent.

Old Battersea Bridge had long been thoroughly out of date, and even unsafe for vehicular traffic, when in 1881 the Metropolitan Board of Works obtained power to erect a new bridge. In due course a contract was entered into with Messrs. Williams, Son, & Wallington, in May, 1886, who undertook to build the new bridge for 143,000*l*. Sanction was obtained for the erection of a temporary foot-bridge, and a contract for this and for the demolition of the old wooden bridge was let to Messrs. Mowlem & Co., in 1885, for the sum of 7,153*l*. The temporary bridge was completed, and the traffic diverted in November, 1885, when the demolition of the old structure was commenced. The work of demolition was completed in April, 1886. The new bridge will span the river in five segmental arches, which will consist of cast-iron ribs resting upon piers of granite. The centre arch will have a span of 163 ft., with a rise of 18 ft., and a headway above Trinity high-water mark of 20 ft. The abutment arches will have a span of 113 ft. 6 in., with a rise of 8 ft. 6 in., and a headway above high water of 10 ft. 6 in., and the intermediate arches will have a span of 140 ft., with a rise of 13 ft. 1½ in., and a headway above high water of 15 ft. 1½ in. The width of the new bridge between the parapets will be 40 ft., divided into a carriageway of 24 ft., and two footways each 8 ft. in width. The carriageway will be supported by seven cast-iron ribs, but the greater portion of the footway will be carried by cantilevers, which will be covered below by a cast-iron coving. The parapet will be an open one of cast-iron. There will be side approaches also from the Chelsea Embankment and from Cheyne-walk, the level of which, says the *Metropolitan* (to which journal we are indebted for these particulars), will also have to be raised, and Cheyne-walk will at the same time be widened to 50 ft. The gradients of all these approaches will be 1 in 30, and the gradients over the bridge will also vary from 1 in 30 to 1 in 31½. On the Surrey side the gradient of the raised approach in the line of Battersea bridge-road will be 1 in 30. It is proposed to widen this road as far as Park-road to 60 ft. The whole of the works have been designed by Sir Joseph Bazalgette, the Board's Engineer, and are being carried out under his superintendence and that of Mr. Edward Bazalgette, one of the Board's assistant engineers.

The works of the Greenwich Ferry, now in course of construction, were visited by the members on the way down to Barking by steamboat to see the sewage outfall works. We take the following particulars as to the ferry from our contemporary, *Engineering*, for February 17 last:—The working plant at this ferry will consist of two steamboats 120 ft. long, 40 ft. beam, and 6 ft. draught; two landing stages 70 ft. long and 60 ft. wide, and four travelling platforms 60 ft. long and 23 ft. wide, together with the necessary engines, winding gear, &c. The steamboats are shaped like a spoon at each end, and are to be worked to and fro without turning; the landing stages are rectangular, as

also are the travelling platforms. Great difficulties have had to be overcome in gaining access from the ferry-boat to the roadway, and *vice versa*, at all times where, as in this case, the river bottom slopes gradually, and the tide rises and falls 20 ft. The principle for making the connexion is as follows:—With the rise and fall of the tide the distance within which the ferry-boats can approach the bank varies to such an extent that a moveable landing-stage has been designed to always remain with the same deck level above water. This stage, together with two travelling platforms, is moved up and down an inclined way, 348 ft. long, sloping riverwards at a gradient of 1 in 10. The inclined way is made of a bed of concrete 50 ft. wide and a minimum of 3 ft. deep, with footings on each side sloping 1 to 1 to a depth of 5 ft. below the river bed. Four lines of rails run longitudinally down the way, with a gauge of 4 ft. 8½ in. and 11 ft. 3 in. centres; the rails are of bridge section, 72 lb. to the yard, bolted to 6 in. by 6 in. wrought-iron transverse sleepers, 30 lb. to the foot, which are in turn bolted to wrought-iron longitudinal sleepers, 6 in. by 6 in., weighing 33 lb. to the foot. Both transverse and longitudinal sleepers are bedded in the concrete, the rails alone appearing above its surface. The work of laying this road-bed and rails was done at low water, the under-water work being put in with skips from barges moored in the river. As the tide falls, the landing stage will be lowered down the incline, and the travelling platforms will work up and down to convey traffic from the banks. The road approaches on each side are 53 ft. wide, ending in an abutment wall, varying in thickness from 3 ft. at the top to 6 ft. on the footings; the road approaches are 5 ft. 6 in. above Trinity high-water mark. On each side of the river, just behind the abutment walls, two cast-iron cylinders are sunk close to each other to a depth of 145 ft. below the level of the roadway. The cylinders are 10 ft. in diameter on top, increasing in size by varying cones to 11 ft. 6 in. in diameter at the bottom; the metal varies in thickness from ¾ in. to 1½ in. The cylinders are for the purpose of wells, in which weights will be worked to act as counterpoises to the travelling carriages and landing-stages; sufficient engine power has been provided to overcome the inertia in moving these platforms, and also any additional weight of traffic which they may carry. As the slope on which they travel is 1 in 10, one-tenth of the weight in the wells will balance that of the platforms and landing-stage. The travelling platforms are four in number, two on each side of the river, rectangular in shape; length, 60 ft.; breadth, 23 ft. 2 in. over all; 21 ft. clear width of roadway between kerbs; depth of steel body, 2 ft. 7 in.; depth over all to top of wood paving, 3 ft. 9 in.; total weight unloaded (each), 125 tons. They are built of mild steel throughout, all vertical plating being ¾ in. in thickness; top and bottom skin, ½ in.; there are four internal longitudinal girders and eleven transverse. Two of the longitudinal and four of the transverse girders form water-tight bulkheads, making a total of fifteen separate water-tight compartments in each. The longitudinal girders are of a ¾ in. web, flanges composed of two angles, 4 in. by 4 in. by ½ in., and a plate of 8 in. by ½ in. Transverse girders ¾ in. web; flange, one angle, 4 in. by 4 in. by ½ in., and a plate of 1 in. by ½ in.; this latter forms the butt covers for skin plating. The rivets throughout are ½ in. in diameter, and 2½ in. pitch. The decks are of 12 in. by 8 in. crosscut Memel timbers, laid on the flat, running transversely, and covered with 6 in. crosscut Memel block-paving. Four lines of tram-rails, 72 lb. to the yard, are laid the whole length of the carriage, flush with the top of the wood paving. Longitudinal guard timbers or kerbs 14 in. by 8 in. are provided on each side, and protected with steel angles 4 in. by 4 in. by ½ in. Galvanised handrails 1½ in. in diameter run on each side the whole length, supported by stanchions 5 ft. apart. Each travelling carriage is carried on twenty-four steel wheels 18 in. in diameter fixed under bogies, and so arranged on pivots that the weight is evenly distributed on each. In case of a carriage getting off the rails, it would float itself, together with an additional weight of fifty tons of traffic. The landing-stages are two in number, one on each side of the river. They are rectangular in shape, 70 ft. 2 in. long, 50 ft. wide; depth of steel body, 6 ft. 6 in.; depth over all from surface of roadway, 7 ft. 8 in.; total weight (each) unloaded, 270 tons. The details of construction are similar to that

of the travelling platforms, saving that they are constructed in two distinct parts, and subsequently bolted together, also that the tram-rails run transversely instead of longitudinally, while on the decks at either end are shelters and the usual offices; bollards are also fixed on the river side of the stage for the secure mooring of the ferry-boats. The stages are carried on thirty-two steel wheels, similarly pivoted to those of the travelling platforms. It is proposed to light the road approaches, platforms, stages, and ferry-boats with electric light. The hauling power provided at each side of the river, to work the platforms and stages, consists of two treble-gear, double-cylinder, high-pressure winding-engines, with cylinders 14 in. in diameter and 18-in. stroke, the winding-drums are 5 ft. in diameter; all winding ropes are of steel wire 1½ in. in diameter. The ferry has been so designed that should the necessity at any time arise to transport railway traffic and rolling-stock from the Great Eastern Railway on the one side to the South-Eastern on the other, it can be done by the present plant, and with this object in view the approaches, platforms, stages, and boats have been constructed. The designs for the plant and arrangement of approaches have been made by Messrs. Standfield & Clark, of 6, Westminster-chambers, who are engineers to the company. The contractors are Messrs. Appley Bros., Limited, of East Greenwich.

Altogether, the round of visits was very interesting and instructive.

#### PUSH AND PULL LOCKS.

KAYE AND OTHERS v. CHUBB AND SON'S SAFE AND LOCK COMPANY (LIMITED).

THIS was an appeal (heard in the House of Lords, before the Lord Chancellor, Lord Watson, Lord Fitzgerald, and Lord Macnaghten) from a decision of the Court of Appeal reversing a judgment of the Queen's Bench Division in an action brought by the appellants against the respondents for the alleged infringement of a patent apparatus for fastening and unfastening doors, gates, lids, and windows.

Sir H. Davey, Q.C., Mr. Aston, Q.C., and Mr. Macrory appeared for the appellants; and the Attorney-General and Mr. Bunting for the respondents.

The appellants' and the respondents' door-latches are all made on what is known as the "push and pull" principle—that is to say, the latch is withdrawn from the doorpost, not by turning the door-handle round, but by pulling the inside handle or pushing the outside one. At the trial in November, 1886, Mr. Justice Mathew gave judgment for the appellants; but his decision was reversed by the Court of Appeal, who ordered judgment to be entered for the respondents. At the hearing of the appeal judgment was postponed.

Their Lordships now gave judgment, being of opinion that the appellants' invention was valid.

Judgment reversed, with costs.—*Times*.

#### SEVILLE CATHEDRAL.

SIR,—Some few days back it was reported in the *Morning Post* that one of the piers of the nave of Seville Cathedral had given way and fallen, bringing down a part of "the roof," and crushing the organ underneath. Such a catastrophe is a subject of the greatest possible interest, not only to architects and artists, but to the world in general, and it is to be hoped we shall hear that measures have been taken to secure the other parts of the structure, weakened as they must be by the fall of the arch and groining over it.

When at Seville in 1882 I noticed that very extensive works of reparation were going on in the north transept and in the bays of the "Capella Mayor" next to the "Crucero." At Seville there is no roof (as we use the word), for the groining itself is the only covering, and is paved at the back, so that the water finds its way down into the "pockets," and thence is discharged by pipes; but I was told that there had been extensive leakages, and that the reparations were made necessary by some failures due to this cause.

It is to be feared that the fall of the pier may be due to the soaking of wet, or it may be on account of some defect in its building, though in the fourteenth century such work was better done than in Norman times.

The organs are under opposite arches of the "coro," which, as is usual in Spanish churches, occupies the eastern bays of the nave. It is therefore to be feared that the splendid stall-work must also have suffered. It is to be hoped that the account given is exaggerated, and that the



harm done is comparatively easy of repair. But, when one remembers the magnificent effect of the interior, due partly to the rich brown tone of age, reminding one of the somewhat similar tone of Westminster, it is somewhat to think of the necessary patchwork effect of a quantity of new masonry.

R. HERBERT CARPENTER.

Aug. 7, 1888.

#### DOWN DRAUGHT IN DWELLING-HOUSE CHIMNEY.

SIR,—Respecting the inquiry of "Boreas" [*Builder*, p. 89, ante], I venture to suggest the advisability of ascertaining if there is in the chimney, just over the register of the stove, a large open space or pocket; if so, the bricking-up of it will, in all probability, lessen the noise; and the registers may shut, but yet not fit, i.e., close off tightly. I do not advise cowls or wind-guards in such a case, but a cone at the top of chimney, such as a funnel turned upside down on to it, and cut off at a spot where the diameter of the cone of the funnel is the same as the chimney, and then raised and supported on stays so that the bottom edge of the funnel ring is just below the top of the chimney.

A similar means of closing the top could be made as that used to close pottery and such kilns, but this is not at all sightly on a dwelling-house.

F. BOTTING.

#### ST. CLEMENT'S WELL.

SIR,—Adverting to your "Note" (p. 78, ante) relating to the vacant ground adjoining the new Law Courts, I am informed that some remains of the old St. Clement's well were found on the digging up of the vacant ground. I was told that the well was discovered at a distance of, say, 30 yards, west, from the engine-house door. It was speedily obliterated; nor, so far as I know, was any record made of its situation.

Since the ground is about to be laid out,—by private munificence,—for public benefit, the well may possibly be again uncovered. In that event it is to be hoped that some mark will be set up to indicate the precise position of a spring whose sweet, clear water was once so venerated, and is commemorated by

FITZSTEPHEN.

August 7, 1888.

### The Student's Column.

#### ARTIFICIAL STONES.—VI.

Stones formed from Plaster of Paris (continued).

**IN** Jacobson's patent the plaster is treated with a hot saponaceous solution made by adding to ten times their weight of hot water a mixture of stearic acid and soda lye.

A large number of stone-like products are obtainable by the admixture of the salts or other hardening or binding materials with the plaster before casting. Such stones are in some cases weather-proof, more ornamental, and much harder than ordinary plaster casts.

Brethauer's weather-proof plaster casts are made by mixing a little lime with the gypsum, and making up the mixture with lime-water; when the cast is dry it is painted with hot linseed oil. Although the matter does not strictly belong to this section of our subject, it may be useful to point out that the converse of Brethauer's mixture forms Colonel Scott's well-known "selenitic mortar," in which the water used for mixing with a little plaster of Paris, or, less preferably, sulphate of iron, the resulting mortar becoming much harder than is ordinarily the case.

Evaux's artificial marble is directed to be formed from plaster of Paris treated with alumen and suitable mineral colours, the ground being zinc white. Rowbotham and Richardson also employed plaster of Paris and alumen in the production of their artificial stone; the alumen was mixed with the plaster, and coagulated by heat or chemical agency, such as washing over with or soaking in a solution of tannic acid. The product was a substance capable of taking a high polish, and resembling white marble. The addition of suitable pigments permits of the manufacture of effective coloured imitations.

Lilienthal utilised for his artificial stone Keene's cement, which is a mixture of alumen and plaster of Paris. This is added to slaked lime and curdled milk. The composition dries and hardens well if left undisturbed.

Stucco made with plaster of Paris and a solution of gelatine forms a firm coating which polishes well, and can be treated so as to resemble marbles of different kinds. Scagliola, which is formed from such a stucco, is one of the oldest of the mixtures employed to imitate ornamental marbles. The substance has long been used in Italy, but is believed to have been first used in this country by James Wyatt in the latter half of the last century, it being employed by him in the decoration of the columns of the Pantheon in Oxford-street. The successful imitation of marble, of course, depends on the skill and taste of the artist, but the following is a brief sketch of the operations involved. The stucco is formed of carefully-calced and well-powdered pure gypsum, mixed to a suitable consistency with solutions of best glue or isinglass, and the necessary dyes or pigments are also added at this stage, if a coloured marble is desired. For the veins, streaks, &c., the different colours are carefully arranged and laid on, the veins being, as it is technically termed, "floated in." When set, the surface is rubbed down with pumice and cleaned with a wet sponge, polished with Tripoli earth and pure charcoal first, then with Tripoli oil, and lastly with oil only.

An artificial stone called "lithomarlite" is obtained by adding to a sufficient quantity of plaster of Paris three gallons of water, half a pint of glue water, and three ounces and a half of powdered borax.

In "Keating's" and "Parian" cement we also find borax mixed with plaster of Paris, which enables a more ornamental and marble-like surface to be produced.

Other artificial stones in which plaster of Paris is the leading constituent are the following:—Lincolne and Chaffer's stone, in which either Keene's cement or ordinary plaster of Paris is suitably coloured, and then thrown forcibly on to polished surfaces or pressed into moulds having smooth internal surfaces of glass or metal so as to produce a bright smooth cast free from air bubbles.

### Books.

*Lessons in Decorative Design: an Elementary Text-book of Principles and Practice.* By F. G. JACKSON, Second Master in the Birmingham Municipal School of Art. London: Chapman & Hall, 1888.

**THE** author of this small book, which is put forth as an inexpensive text-book of the study of the principles of decorative design, quite understands the philosophy of his subject. He upholds the view, now recognised as truth by all thoughtful artists and students of decorative art, that such art "rests on adaptation, and there cannot be true ornament unless we employ art in adapting our details to the object to be decorated." But in conjunction with this he adds a piece of advice, the truth and importance of which is in danger of being forgotten, that in the pursuit of the power of decorative design, "the power to render natural forms pictorially should not be neglected, but, on the contrary, should be cultivated to the highest point." This is perfectly true. No one who cannot draw a flower with truth and beauty of natural representation is likely to be able to apply it in a conventional form with artistic truth and beauty. For it is part of the very process of conventionalising ornament that the essential and most characteristic parts of the original model should be laid hold of and emphasised, and it is only the careful student and delineator of the natural form who can enter so thoroughly into its character and essential point of design as to lay hold of and translate these into ornament. We sometimes meet with teaching and practice in ornamental design which would lead one to the supposition that the employment of natural forms in ornament really consisted in a kind of dissection of a flower, and a reduction of its parts to a collection of forms geometrically arranged. That kind of work, however, is often rather contrivance than design in the proper sense.

On plate xiv, and in the remarks in connection therewith, we observe that the author suggests an idea as to the origin of the "Acanthus" leaf in Greek ornament, which we have not noticed before; he suggests it as a development out of the radiating brush form, commonly called the honeysuckle ornament, by grouping the brush-marks together in threes,

leaving a little space between each group, which becomes the rib of the leaf. Thus, he says, "the result is the creation of an ornamental leaf which, while it has no exact prototype in Nature, yet possesses natural qualities, and is more truly decorative than a natural leaf can be, because it has been developed out of certain constructive necessities and in perfect harmony with natural laws." We are disposed to think that the Greek acanthus leaf is more of a direct adaptation from Nature than this, but the idea is ingenious, and may suggest some new treatments in decorative leaf-design.

The only defect of the book is that the illustrations are, for the most part, not very well or finely drawn, nor very attractive in themselves, which is to be regretted in a book on ornament, considering that ornament is attractive or nothing. As diagrams to illustrate the remarks, no doubt they fulfil their object well enough; but they do not do much to train the pupil's eye in the right way. This is the only criticism we have to make. In regard to general theoretic teaching the book is a sound and rational guide, and may be recommended as such.

*Building Estates: a rudimentary treatise on the development, sale, purchase, and general management of building land, including the formation of streets and sewers, and the requirements of Sanitary Authorities.* By FOWLER MAITLAND, land and engineering surveyor. Second edition, revised. London: Crosby Lockwood & Co., 1887.

CONSIDERING that the book with this title consists of only 112 pages 12mo, it will be readily perceived that it must be distinctly "rudimentary." It would be useful for giving general readers an idea of the nature of the transactions involved in obtaining and managing an estate, and all knowledge of affairs may have its interest and value; and it may serve to suggest to an intending purchaser of an estate the nature of the enterprise he has embarked on, and the points he will have to take thought for in the course of it. But the book will not enable anyone to become his own land or building surveyor, or his own conveyancer; nor, perhaps, is it intended that it should. The preface, however, seems to imply that it was intended as a possible guide-book "to some who, without previous experience, find themselves engaged on work of this nature." The second part contains general information as to the jurisdiction and regulations of sanitary authorities, which may be useful to many people, and brief advice about the laying-out of sites for building and the operations of surveying. These are all good as far as they go, but their chief use will be in enabling general readers to gain some little knowledge about a department of work the general principles of which, at least, any one may find it some day or other desirable to know something of.

*Architects' Joinery and its Ornaments.* By F. A. FAWKES. London: B. T. Batsford. 1888. THIS is in reality a pattern-book of mouldings and ornaments kept in stock, designed in the now-prevalent free Classic style. They are good of their kind, though we do not see the particular value of them to architects, who, if they really care for the interior finish of their buildings, usually prefer to design their own mouldings.

*The Great Eastern Railway Company's Tourist's Guide to the Continent.* Edited by PERCY LINDLEY. Illustrated. New edition. Published for the G.E. Railway Company.

THIS is a well-written guide to that part of the Continent, viz., Holland and Belgium, to which the Great Eastern Railway, via Harwich, affords the shortest route. The guide also includes the Bernese Oberland. It contains a good deal of information about the places named, accompanied by a number of small views of landscape and buildings, which perhaps are rather intended to attract the tourist beforehand than to serve as records after the visit, but they form an ornamental addition to the interest of the volume, which is conveniently small in size.

*The Swedish Granite Industry.*—We referred recently to the flourishing state of the Swedish granite industry, and we now learn that a Swedish quarry has received the order for all the granite and sandstone required for the new Town Hall in Hamburg, valued at £25,000. Moreover, the other day an order for 500 heavy grave monuments of various kinds of granite for Germany was executed by a firm in Varberg.



## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

10,950, Apparatus for Closing Doors. J. H. Bean and W. Gaines.

This invention refers to an improvement on or addition to a former specification, whereby an ordinary radial cylinder is employed with a piston-rod working therein. In order to ensure greater steadiness, at the outer end of the piston-rod is mounted a pulley engaged within a link or slotted arm and hinged to a bracket on the easement and door-frame. When the door is opened a radial movement is imparted to the link or slotted arm by the rod attached to the door-frame. The pulley being engaged with the link or slotted arm rolls therein, causing the piston to be withdrawn from the cylinder, and the spring therein to be compressed. When the door is released the spring operates upon the piston through the medium of the pulley, bringing back the link to its original position and closing the door.

11,103, Fixing Wood Linings to Walls and Ceilings. F. W. Jones.

According to this invention an iron web is used of I shape, with holes drilled in the longest flange, and tapped for screws. One end is built in the wall, the other flange and projects out, and to this skirting-board, framing, door-jamb, &c., may be fastened.

11,961, Door-Springs. B. Turner.

This invention consists in the combination with the spring which acts upon the door of a check cylinder, of a fitted piston, by means of which the slamming of the door as it closes is entirely prevented. The combination with a door-spindle acted on by a spring or an arm secured thereto, and forming the rod of a piston caused to reciprocate in a cylinder as the door opens and closes is the chief claim of the invention.

12,014, Automatic Appliance for Closing Doors. G. Brewer.

The appliance which is the subject of this invention consists of a standard or bracket having a forked and thereto, in which a pulley is mounted to carry or receive a caoutchouc or other cord. The two ends of the cord are made into a ring held by pins or studs, one of which is secured to the door-frame, the other to the door, forming an angle the summit of which is on a pulley affixed and the base on the door and frame; the caoutchouc contracting closes the door.

12,239, Hand-Saws. R. M. Johnson and T. H. Benton.

This invention has for its object the use of one handle with any number of blades, the parts being so constructed that they may be separated and secured together again with the greatest ease and rapidity. The butt end of the blade is made with a projecting rib or ribs on each side of the blade. A nearly half-round strip of metal is rivetted or otherwise secured to the blade, so that with the intermediate thickness of the blade the cross section would be a circle. At the end of the sawgate made in the handle to receive the blade a hole is bored, corresponding with the ribbed end of the blade, and so that the butt end of the blade may be slotted into it.

## NEW APPLICATIONS FOR PATENTS.

July 27.—10,876, W. Hardcastle, Attaching Lines, Cords, or Chains to Window-shades, Shutters, &c.—10,882, E. and E. Kerry, Joining Drain-pipes, &c.

July 28.—10,908, W. Cairns, Drain-pipe.—10,913, G. Davis, Drain Traps.—10,922, J. De Jong, Tip Wagons.—10,955, H. Schou, Door Stops and Closers.—10,960, E. Newton, Surveying and Levelling Instruments.

July 30.—10,966, G. Woodliscroft, Decorating Tiles, &c.—10,973, C. Armstrong and J. Robinson, Safety Hydrostatic Blasting Tube for Blasting Stone, &c.—10,979, T. Thorp, Water Motor and Waste Preventer.—10,980, C. Shawbrooks, Roofing Tiles.—11,019, W. Moseley, Electric Bells.—11,027, R. Petrie, Draw and Push Bolts for Doors, Windows, &c.

July 31.—11,089, G. Long, Fence and other Posts.

Aug. 1.—11,148, T. Douse, Checking or Subduing Fire in Buildings, &c.

Aug. 2.—11,176, J. B. Signs, Sign-writing, and Street Directions.—11,198, E. Brooke, Burning White or Coloured Glazed Bricks, &c.—11,199, J. Ferguson, Finger Plates.—11,202, C. Schubert, Band-saw Machinery.—11,211, A. Falkner, Locks and Keys.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

11,237, H. Noble and G. Haley, Hearths of Fireplaces, Fenders, and Dadoes of Metal and Enamel.—5,808, A. Ponton and Others, Artificial Marble, Granite, and Other Stone.—8,630, P. Clark, Kitchen Ranges.—9,080, T. Robb, Parquet Flooring, &c.—9,442, M. Lanedell, Set Squares, T Squares, &c.—9,793, F. Smith, Bars or Heads for Ventilating and Flue Shafts.—9,792, W. Stephenson, Door-closing Apparatus and Door Checks.—9,826, I. Kirkbride, Raising or Lowering Window-shades and holding them in any desired position.—10,005, J. Brown and W. Mackenzie, Nails.—10,072, E. Carpenter, Connecting Pipes.—10,078, A. Boulton, Artificial Marble and Serpentine.—10,180, J. D.

Fonseca, Water-closets and Urinals.—10,304, A. Menant, Connecting Lengths or Sections of Gutters, &c.—10,382, T. Crapper, Disconnecting Traps for Sanitary Purposes.—10,365, E. Oates, Paint-removing Compound.—10,473, J. Schlesinger, Manufacture of Cement.—10,673, R. Wright, Self-Locking Window-sash Fastener.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

11,966, J. Petter, Stoves and Fireplaces.—12,467, A. Winrow and H. Roostandy, Brickmaking Machines.—12,857, H. Waddington, Ventilator.—13,127, A. Stephenson, Butt Hinge and Method of Fixing same to Doors.—13,258, W. Dutton, Revolving Door-post, or other Posts for Public Buildings, &c.—5,548, R. English, Condensation Gutters, Metal Weatherings, and Door-step Plates.—6,023, J. Trinick, Sash Fasteners.—9,234, J. Cartland, Door Bolts, &c.—9,656, A. Elmendorf and Others, Water-closets.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

July 26.  
By S. & G. KINGSTON (at Bourn).  
Lincolnshire, Bourn, near—A residence and 27a, 3r, 12p., sold for £5,200.  
Dock Furrow Farm, and 75a, Or. 3p., 3,600.

July 30.  
By WALKER & RUNZ.  
Woodberry Down—The Limes, 33 years, ground-rent £19, 13s.  
Clapton—107 and 109, Eldersfield-road, 90 years, ground-rent £5, 5s.  
By G. A. WILKINSON.  
Forest Hill—129, Stanstead-road, freehold  
Sydenham—5, West-hill, and 2a, 1r, 26p. freehold  
By Messrs. CROOK.  
West Malling, Kent—Springetts Hill Farm, 44a, 3r, 12p., freehold  
Birling—An enclosure of land, 6a, 1r, 30p., freehold  
By J. & R. KNEP & Co.  
Kentish Town—63, Lawford-road, 73 years, ground-rent £3.  
By A. R. SAYLER & SON.  
Mile End—51, St. Peter's-street, 42 years, ground-rent £3, 9s.  
By HARMAN BROS.  
Beckenham, Clifton-terrace—Ground-rents of £68, term 71 years  
Church-road—Ground-rents of £24, term 71 years  
South Norwood—Ground-rents of £48, term 73 years  
Forest Hill—129, Stanstead-road, freehold  
Beckenham, Mackenzie-road—A plot of freehold land  
Brondesbury—11, Winchester-road, 71 years, ground-rent £16, 18s.  
South Acton—21, Osborne-road, freehold  
By PRICKEP, VENABLES, & Co.  
Lambeth—28, 29, and 30, South Lambeth-road, freehold  
By L. FARMER.  
St. John's Wood—28, Alma-square, 64 years, ground-rent £9.  
Kilburn—53, Princess-road, 74 years, ground-rent £7, 10s.  
Maida Vale—39, Carlton-road, 60 years, ground-rent £8.  
By G. W. DIXON.  
Islington—11, Rochester-terrace, 55 years, ground-rent £8.  
By A. RICHARDS.  
Tottenham—The residence, Piper's Court, and 1½ a., freehold  
Two fresh cottages  
High-road—A plot of land, area 2,385 ft., freehold  
1, Laurel-croft, 78 years, ground-rent £5, 5s.  
By RAYMOND & BACON.  
Commercial-road East—16, Harding-street, freehold  
Victoria Park—1 to 9 odd, Prince Edward-road, 83 years, ground-rent £15  
By DUBREHAM, TOWSON, & Co.  
Maidenhead, Castle Hill—Shirley Cottage, and 6a, 2r, 0p., freehold  
By VETROM, BULL, & COOPER.  
Newington-butts—26 and 28, Draper-street, freehold  
Streatham—1, 2, and 3, Greyhound-lane, and a plot of land, freehold  
1, 2, and 3, Church-place, freehold  
1 to 4, Woodside-cottages, freehold  
2 and 3, Greyhound-place, and a corner shop, freehold  
High-road—Freehold enclosure of land, 6a, 1r, 1p.  
A plot of freehold land, with buildings thereon.  
By C. & H. WHITE.  
Tulse-hill—112, Newwood-road, 91 years, ground-rent £10, 10s.  
Walworth-road—A plot of land, area 1,545 ft., let at £68 a year  
A plot of land, area 642 ft., let £16 a year  
Aug. 1.  
By B. BROWN.  
Norwood, Belvidere-road—Emaley Lodge, 69 years, ground-rent £18  
Millwall—215 and 217, West Ferry-road, 23 years, ground-rent £5  
By G. PEARCE & SONS.  
Islington—84 and 88, Frebend-street, 39 years, ground-rent £3, 8s.  
Horton—41, Baring-street, 45 years, ground-rent £3, 16s.  
Clapham—42, 44, 46, and 50, Fendiman-road, 37 years, ground-rent £28  
By H. RUTLEY.  
Wallington, Clifton-road—Two plots of freehold land  
By FULER, HOBBS, SONS, & CASSELL.  
Rotherhithe—The Horse Public-house, freehold.

By GIBBY & TURNER.  
Netley, Hants.—The Hermitage, and 8½ a., leasehold, ground-rent 5s. £1,800

By W. W. JERKINSON.  
Heuley—A plot of freehold land 135  
Stamford Hill—Ground-rent of £25, reversion in 91 years 550

By GIBBY & SON.  
Hammer-smith—69 to 75 odd, Bridge-road, copyhold 2,365  
62 to 68 even, Bridge-road, copyhold 1,590  
Copyhold ground-rents of £26, reversion in 48 years 785

Improved ground-rents of £18, 8s., and the residence called Jamaica Lodge, term 20 years 440  
Improved ground-rents of £18, 14s., term 20 years 200

## Aug. 2.

By J. BAKER & SON.  
Walham Green—Eleven plots of freehold land 350  
Willenden-lane—Three plots of freehold land 150  
Walhamston—42, 44, and 46, Beaulah-road, freehold 650

Stoke Newington—104 and 106, Winston-road, 72 years, ground-rent £11 525

By SIZLER, HATTON, & Co.  
Enfield, Chase Side—Four plots of freehold land 175

By HARCOURT, MILLS, & Co.  
Epsom, Upper Down's-road—The Rhallit, freehold 1,420

By IZARD, DAWES, & Co.  
Walhamston—Greenside and Greenleaf Houses, freehold 625

By BOBBROW & FISHER.  
Marylebone—44, 46, and 50, Church-street, 33 years, ground-rent £31, 10s. 955

By R. J. COLLIER.  
Clapton—23, Heyworth-road, freehold 740  
South Hackney—47, Cassland-road, 73 years, ground-rent £3, 0s. 340

By NEWBORN & HARDING.  
Ilford—13, 14, and 15 (unbuilt), Ostlands-avenue, 90 years, ground-rent £11 80  
Holloway—40, Davenant-road, 70 years, ground-rent £7 240

Islington—20, Cloudeley-square, 22 years, ground-rent £3 130

By C. D. FIELD & SONS.  
Bermondsey New-road—A plot of freehold land, area 6,345 ft. 1,260  
Four plots of freehold land 2,580  
Dockhead—A plot of freehold land, area 3,860 ft. 450

Aug. 3.  
By A. & A. FIELD.  
Mile End—21 and 22, Sidney-square, 12 years, ground-rent £7 315  
Spitalfields—24, Wheeler-street, 21 years, ground-rent £30 205  
Mile End—30, St. Ann's-road, freehold 205

By MULLERT, HOOKER, & Co.  
Hyde Park—9, Sussex-mews East, 47 years, ground-rent £15 460

## MEETINGS.

## SATURDAY, AUGUST 11.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Coventry.

## MONDAY, AUGUST 13.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. T. Gamage, 8 p.m.

Royal Archaeological Institute.—Leamington Congress (continued). Visits to Baddeley Clinton, Knowle, Solihull, Meriden, Berkeswell, and Coventry.

## TUESDAY, AUGUST 14.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Leicester.

## WEDNESDAY, AUGUST 15.

Royal Archaeological Institute.—Leamington Congress (continued). Visit to Melton Mowbray.

Builders' Foremen and Clerks of Works' Institution.—8.30 p.m.

## Miscellanea.

## Brickmaking and the Recent Rains.

The reports received from the various brickfields in Kent and other surrounding districts for some weeks past show that the continued wet weather is having a very serious effect upon the manufacture. Some of the fields have been almost stopped, while all have lost considerable time, and consequently have made many less bricks than they are accustomed to. The result will be that stock bricks and other qualities of that class will be very scarce, and there is every prospect of the price, which has for three or four years been abnormally low, being advanced considerably. The heavy rains and disastrous floods of last week caused great havoc in some districts, particularly in Essex, whence it is reported that some hundreds of thousands of bricks that had been partially dried in the hacks have been washed down, thus still further reducing the previously small quantities made.

**Society of Arts.**—The Society offer prizes to art-workmen for the session 1888-89, in pottery, stone-carving, wrought iron work, and goldsmiths' and silversmiths' work. All articles for competition must be sent in to the Society's house on or before Tuesday, April 23rd, 1889. Further particulars can be obtained from the Secretary of the Society of Arts, John-street, Adelphi.



**The Tower Bridge.**—The following is a description of the new bridge which is rising east of the City, under the direction of the Corporation, and a comparison of it with London Bridge:—Total length of bridge, 940 ft.; total length of bridge and approaches, 2,640 ft.; opening span, width, 200 ft.; opening span, headway, when opened, 135 ft.; opening span, headway, when shut, 29 ft. 6 in.; side spans, width, 270 ft.; side spans, headway, from 20 ft. to 27 ft.; width between parapets, opening span, 50 ft.; width between parapets, side spans and approaches, 60 ft.; steepest gradient of approaches, 1 in 40 (steepest gradient of approaches of London Bridge, 1 in 7); depth of foundations, 60 ft. below Trinity high water mark, 27 ft. below bed of river; sectional area of waterway, 20,040 square feet (London Bridge, 19,300 square feet); depth of water in opening span at high water, 33 ft. 6 in.; depth of water in opening span at low water, 13 ft. 6 in. Estimated quantities of materials in the bridge and approaches:—Bricks, 31,000,000; concrete, 70,500 cubic yards; cement, 19,500 tons; granite and other stone, 235,000 cubic feet; iron and steel, 10,500 tons. Machinery, &c.:—Two steam pumping engines for hydraulic machinery, each 360-horse power; eight large hydraulic engines and six accumulators, four hydraulic lifts in towers for passengers; size of each leaf of opening span, 50 ft. wide by 100 ft. long; weight of each leaf of opening span, including roadway and counter-balance weights, 700 tons; estimated cost, 750,000. *City Press.*

**The Birkbeck Building Society.**—The thirty-seventh annual meeting of the Birkbeck Building Society was held on the 26th ult. at the offices, 29 and 30, Southampton-buildings, Chancery-lane. The report, adopted unanimously by the meeting, deals with big figures, for it states that the receipts during the year, ending 31st March last amounted to 9,894,559l., making a total from the commencement of the Society of upwards of one hundred millions sterling (109,608,081l.). The deposits during the past year were 7,170,842l., and the subscriptions 182,989l., while the gross profits amounted to 177,155l. It is stated that the surplus funds have been augmented to the extent of 377,255l., and are now upwards of four millions (4,061,899l.), nearly two millions (1,830,133l.) being invested in British Government and Indian and Colonial Securities. In addition, there is a balance in the hands of the bankers of 341,846l. The balance profit in excess of liabilities is 222,214l. The twelfth triennial bonus (amounting to 23,713l.) has been allotted to the shareholders during the year, in addition to which 15,000l. have been added to the permanent Guarantee Fund, which is now stated to stand at 125,000l., the whole being invested in Consols. The subscriptions and deposits withdrawable on demand amount to 4,374,469l. There are 49,763 shareholders and depositors.

**The Proposed New Tooting Railway.**—The proposal (to which we recently referred) for constructing a line of railway from High-street, Tooting, to the Wimbledon and West End section of the London and South-Western line, and also from Tooting to the London and Brighton line at Streatham, is being actively agitated, a large and influential committee having now been formed in support of the undertaking. Last week a numerously-attended meeting of the inhabitants of Summers Town, through which the proposed line will pass, and where there will be a station, was held in the parish school-room, when a very strong feeling was expressed in favour of the proposed line being carried out. Mr. Grover, C.E., the engineer who has designed the line, explained the course which it was proposed it should take. He observed that at present, as regards railway communication, they might almost as well be in China; but should the proposed railway be carried out, Tooting would be placed in direct communication with the City on the one hand, and with the West End on the other hand. He said that one great thing in their favour was that the line—about three miles in length—could be made very cheaply, as it would pass through a district where there were very few houses, and consequently there would not be any large amount of compensation to be paid, whilst the line itself could be made at an unusually small cost. It was stated at the meeting that neither the London and Brighton nor the London and South-Western Company intend to offer any opposition to the line.

**The English Iron Trade.**—Although there has been a slight relapse in the pig-iron trade, the English iron market, on the whole, remains firm, with a good business doing. The partial check in pig metal can only be considered temporary, as the shipments still keep up well, and the home consumption is satisfactory. Prices of Scotch pig-iron warrants have fluctuated round 39s. cash, whilst Scotch makers' iron has changed but little. At the beginning of the week, North of England pig was about 3d. per ton lower, but it has since recovered. Lancashire iron is well maintained. Hematite pig is nominally held at 43s. 6d., but little business has been at full rates. Manufactured iron is firm in tone, there being a rising tendency, and makers report good orders. The steel trade is in a fairly prosperous condition, full activity being maintained at works. The demand for shipbuilding material is especially well sustained, shipbuilders being fairly busy. Engineers continue well employed.

**The "Alexander Thomson" Memorial.**—At a meeting of the trustees, held in the Religious Institution Rooms, Glasgow, on the 1st inst., Mr. David Thomson, President of the Glasgow Institute of Architects, in the chair, Mr. William James Anderson, who gained the architectural travelling studentship in December last, submitted the sketches which he had made during his tour in Italy, together with a descriptive memoir in manuscript. The sketches, sixty-four in number, with nine sheets of measured drawings, were exhibited on the walls, and carefully examined by the trustees, who expressed themselves extremely gratified with the work, as evidence of Mr. Anderson's diligence and industry while on his tour, as well as of his skill and ability. In the National Competition at South Kensington the silver medal has just been awarded for the drawings of the prizeman, and the competitive drawings of two of the other candidates for the Alexander Thomson Studentship have also gained prizes at South Kensington.

**The Registration of Plumbers.**—At the City and Guilds Institute, Finsbury, on Saturday afternoon, an examination was held, under the auspices of the Plumbers' Company, for certificates of registration. The practical examination included various branches of lead-work and the theoretical questions relating to the subjects of plumbers' materials, house-fittings, and sanitation. Plumbers attended from several districts of Middlesex, Surrey, and Yorkshire. The examiners were Mr. Chas. Hudson (assistant-chairman of the registration committee), and Messrs. Clarke, Gilbert, Nurse, Webb, and Mills. Seventy-five per cent. of those attending passed the full examination, being 25 per cent. higher than the result of last week's examination.

**New Schools at Monton Green, near Manchester.**—Building operations have just been commenced for the new schools adjoining the church erected here some years since. The schools are intended as a memorial to the late Mrs. Booth, and other members of a family who were large benefactors to the church and neighbourhood. The building will be faced with stone parquetry and Darley-dale ashlar, and will contain large school and class rooms on ground floor, with meeting room 64 by 32 ft. on first floor, and social rooms for the use of the congregation. The architects are Messrs. Thos. Worthington and F. G. Elgodd, Manchester; and Messrs. Southern & Sons are the general contractors.

**The London and County Banking Company (Limited).**—The half-yearly report of the Directors of this Bank (which will be found in *extenso* in our advertising columns) states that, after paying interest to customers, and all charges, making provision for bad and doubtful debts, and allowing 21,837l. 13s. for rebate on bills not due, the net profits amount to 215,547l. 18s. 6d. This sum, added to 22,134l. 7s. 8d., the balance brought forward from last account, produces a total of 237,682l. 1s. 2d. The Directors have declared an interim dividend for the half-year of 10 per cent., which will absorb 200,000l.

**"Short" Quantities.**—Some letters on this head we are obliged to defer to next week, when we may also have some further comment to make on the questions suggested by the recent decision.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |           | £. s. d.   | £. s. d. |
|---------------------------------------------|-----------|------------|----------|
| Greenheart, B.G.                            | ton       | 6 10       | 7 10     |
| Teak, R.L.                                  | load      | 5 0        | 12 10    |
| Sequoia, U.S.                               | foot cube | 0 2        | 0 3      |
| Birch, Canada                               | load      | 2 15       | 0 45     |
| Fir, Danzig, &c.                            | 2 0       | 0 4        |          |
| Oak                                         | 2 0       | 4 30       |          |
| Canada                                      | 4 0       | 6 10       |          |
| Pine, Canada red                            | 2 10      | 0 30       |          |
| " yellow                                    | 2 10      | 0 30       |          |
| Lath, Danzig                                | 14 0      | 5 0        |          |
| St. Petersburg                              | 5 0       | 6 0        |          |
| Waincoat, Odessa, crown                     | 2 10      | 0 30       |          |
| Duals, Finland, 2nd and 1st                 | 8 0       | 0 10       |          |
| " 4th and 3rd                               | 6 10      | 0 7 10     |          |
| Riga                                        | 6 0       | 7 10       |          |
| St. Petersburg, 1st yellow                  | 9 10      | 0 14 10    |          |
| " white                                     | 7 0       | 10 0       |          |
| Swedish                                     | 7 0       | 15 10      |          |
| White Sea                                   | 8 0       | 17 0       |          |
| Canada, Pine, 1st                           | 14 0      | 23 0       |          |
| " 2nd                                       | 9 0       | 15 0       |          |
| " 3rd, &c.                                  | 7 0       | 0 30       |          |
| " Spruce, 1st                               | 8 0       | 0 10       |          |
| " 3rd and 2nd                               | 6 0       | 0 7 10     |          |
| New Brunswick, &c.                          | 6 0       | 7 5        |          |
| Baltens, all kinds                          | 4 10      | 0 11 0     |          |
| Flooring Boards, sq., 1 in. prepared, first | 0 10      | 0 13 0     |          |
| Second                                      | 0 7       | 0 9 8      |          |
| Other qualities                             | 0 4       | 0 6        |          |
| Cedar, Cuba                                 | 0 3       | 0 4        |          |
| Honduras, &c.                               | 0 0       | 3 0 0 3 2  |          |
| Australian                                  | 0 0       | 23 0 0 3 2 |          |
| Malagasy                                    | 0 0       | 42 0 0 6 4 |          |
| St. Domingo, cargo average                  | 0 0       | 42 0 0 6 4 |          |
| Mexican                                     | 0 0       | 4 0 0 4 4  |          |
| Tobacco                                     | 0 0       | 44 0 0 6 4 |          |
| Honduras                                    | 0 0       | 44 0 0 6 4 |          |
| Rose, Rio                                   | 8 0       | 0 11 0     |          |
| Box, Turkey                                 | 5 0       | 0 12 0     |          |
| Walnut, Italian                             | 0 0       | 42 0 0 6 4 |          |
| IRON Bar, Welsh, in London                  | 4 17      | 6 5 0      |          |
| " at works in Wales                         | 4 7       | 4 10 0     |          |
| " Staffordshire, in London                  | 5 6       | 0 7 0      |          |
| CORR.                                       |           |            |          |
| British, cake and ingot                     | ton       | 74 0 0     | 75 0 0   |
| Best selected                               | 75 10     | 0 0 0      |          |
| Sheets, strong                              | 80 0      | 0 0 0      |          |
| Chili, iron                                 | 81 10     | 0 0 0      |          |
| YELLO METAL                                 | lb.       | 0 7 3      | 0 0 7 3  |
| LEAD                                        |           |            |          |
| Pig, Spanish                                | ton       | 13 0 0     | 13 2 6   |
| English, common brands                      | 13 5      | 0 13 7 6   |          |
| Sheet, English                              | 14 5      | 0 14 10    |          |
| SILVER                                      |           |            |          |
| Silesian, special                           | ton       | 18 5 0     | 18 7 6   |
| Ordinary brands                             | 16 0      | 0 16 2 6   |          |
| TRIN                                        |           |            |          |
| Swedish                                     | ton       | 99 10      | 0 0 0    |
| Australian                                  | 89 10     | 0 0 0      |          |
| English Ingots                              | 94 10     | 0 0 0      |          |
| ZINC                                        |           |            |          |
| English sheet                               | ton       | 18 10 0    | 19 0 0   |
| OILS.                                       |           |            |          |
| Linseed                                     | ton       | 18 2 6     | 18 5 0   |
| Cocoon, Cochin                              | 24 10     | 0 27 0     |          |
| Ceylon                                      | 22 0      | 0 0 0      |          |
| Palm, Lagos                                 | 20 0      | 0 20 10    |          |
| Rapeseed, English pale                      | 25 10     | 0 0 0      |          |
| " brown                                     | 24 2      | 0 0 0      |          |
| Cottonseed, refined                         | 20 10     | 0 0 0      |          |
| Tallow and Oleine                           | 25 0      | 0 45 0     |          |
| Lubricating, U.S.                           | 4 0       | 0 6 0      |          |
| " refined                                   | 7 0       | 0 12 0     |          |
| TURPENTINE                                  |           |            |          |
| American, in casks                          | cwt.      | 1 6 8      | 1 7 0    |
| TAR                                         |           |            |          |
| Stockholm                                   | barrel    | 0 15 9     | 0 0 0    |
| Archangel                                   | 0 9       | 0 0 0      |          |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**ACTON.**—For shops in High-street, Acton, W., for Mr. J. Beauchamp. Mr. Edward Mounsey, Junr., architect, Acton, W.,  
 Edwards, J., Ealing ..... £4,050 0 0  
 Nye, T., Ealing ..... 3,039 0 0  
 Pomeroy & Co., Ealing ..... 3,645 0 0  
 Hooper, G., Acton ..... 3,553 0 0  
 Lyford, G., Shepherd's Bush ..... 3,450 0 0  
 Accepted.

**BEDFORD.**—For works at The Bedford General Infirmary. Messrs. Usher & Anthony, Surveyors, Bedford:—

*Internal Painting.*  
 Judge & Ball ..... £130 0 0  
 Small & Co. .... 115 12 0  
 Key (accepted) ..... 108 0 0  
 (All of Bedford.)

*Wrought Iron Fence.*  
 Page & Co. .... £109 14 0  
 Kilpin & Billson ..... 106 15 0  
 Reechin & Isen ..... 85 0 0  
 Baker (accepted) ..... 83 15 0  
 (All of Bedford.)

**BETHNAL GREEN.**—For sundry sanitary works, fencing, &c., at the Workhouse, Bishop's-road, Bethnal Green, for the Guardians of Bethnal Green. Messrs. A. & C. Harston, architects, 15, Lodenhall-street, E.C. No quantities:  
 R. Edwards ..... £800 0 0  
 Thomason ..... 780 0 0  
 Edmunds ..... 634 0 0  
 P. H. Carter ..... 621 0 0  
 J. Knight ..... 597 17 0  
 Barrett & Power ..... 575 0 0  
 T. Lye ..... 400 0 0  
 S. G. Davis, & Co., 59, Southwark ..... 400 0 0  
 Bridge-road (accepted) ..... 470 0 0



# CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of work, or Materials.                    | By whom required.            | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|--------------------------------------------------|------------------------------|-----------------------------------|--------------------------|-------|
| Latting                                          | Leicester Cor. Gas Co.       | A. Colson                         | August 11th              | x.    |
| Low Ward, Sedgefield Asylum                      | Durham County Lunatic Asylum | Official                          | August 13th              | ii.   |
| Limestone or Asphaltic Tar-Paving                | East Ham Local Board         | W. H. Savage                      | August 14th              | ii.   |
| Repairs to Roads, Darford                        | Epsum Union                  | Official                          | do.                      | ii.   |
| Painting and other Work, Darford                 | Met. Asylum Board            | A. & C. Harston                   | August 18th              | ix.   |
| Additional Buildings, S.E. Ambulance Station     | do.                          | do.                               | do.                      | ix.   |
| erection of Wards at Workhouse                   | do.                          | T. W. Aldwinckle                  | August 20th              | ix.   |
| Asphaltic Tar-Paving                             | St. Marylebone Grdms.        | H. Saxon Snell & Son              | do.                      | ix.   |
| Laying-up Roads                                  | Walthamstow Local Bd.        | Official                          | do.                      | x.    |
| Broken Granite                                   | do.                          | do.                               | do.                      | x.    |
| ack Fencing                                      | Hanwell Local Board          | do.                               | August 21st              | ix.   |
| urk at Teddley, Mon.                             | Brentford Local Board        | James & Morgan                    | do.                      | ix.   |
| on Roof for Market Ground                        | Rev. T. Theophilus           | G. J. C. Broom                    | August 22nd              | ii.   |
| andations, General Post-Office North             | St. Helen's Corporation      | Official                          | August 23rd              | ii.   |
| Three Houses for Coastguard, Cornwall            | Com. of H. M. Works          | do.                               | do.                      | ii.   |
| struction of Aqueduct                            | Admiralty                    | do.                               | do.                      | ii.   |
| eservoir, Prestwich                              | Waterworks Com.              | G. H. Hill                        | Sept. 4th                | x.    |
| onework, Prestwich                               | do.                          | do.                               | do.                      | x.    |
| Engineering Work, near Darford                   | do.                          | do.                               | do.                      | x.    |
| Works, Repairs, and Supply of Building Materials | Met. Asylum Board            | A. & C. Harston                   | Sept. 15th               | x.    |
|                                                  | War Department               | Official                          | Not stated               | ii.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.               | By whom Advertised. | Salary.    | Applications to be in. | Page. |
|--------------------------------------|---------------------|------------|------------------------|-------|
| Junior Examiner, Office of Works     | Civil Service Com.  | Not stated | August 22nd            | xiv.  |
| Deputy-Assistant Overseer and Valuer | Brighton Guardians  | 150l.      | August 28th            | xiv.  |

**BLACKHEATH.**—For repairs and decorations to No. 17, Aldbrook Park-road. Mr. Leonard V. Hunt, architect, 5, Queen Victoria-street, E.C.—  
**Couchman & Co., Blackheath** ..... £284 0 0  
**Hodson Bros., Lewisham** ..... 254 0 0  
**S. J. Jerrard, Lewisham** ..... 192 0 0  
**Kennard, Bros., Lewisham (accepted)** ..... 158 0 0

**BRADWELL-ON-SEA (Essex).**—For alterations and additions to farm-house, Bradwell-on-Sea, Essex, for Mr. Jos. Wille. Mr. Harold O. Jackson, architect—  
**H. Bishop, Southminster** ..... £120 0 0

**CHESHUNT (Herts).**—For making alterations and additions to residence, Cheshunt, Herts, for Mr. John Fowler. Mr. Harold O. Jackson, architect—  
**T. Penally, Waltham Abbey** ..... £1,740 0 0  
**W. Littlefield, Enfield** ..... 1,427 0 0  
**F. Sanders, Cheshunt** ..... 1,357 0 0

**CHESHUNT (Herts).**—For new conservatory, lavatory, and other works at residence, Cheshunt, Herts, for Mr. Wm. J. Galloway. Mr. Harold O. Jackson, architect—  
**Crompton & Pawkes, Chelmsford** ..... £330 0 0

**CROYDON.**—For alterations to No. 104, North-end, for Alfred Broad, architect, Croydon. Quantities supplied by the architect—  
**J. O. Richardson, Peckham (accepted)** £294 0 0  
 [No competition.]

**DULWICH.**—For alterations and repairs to Glenmore house, Underhill-road, Dulwich, for Dr. Rand. Mr. H. G. race, architect—  
**Mitchell** ..... £260 0 0  
**Whitehead** ..... 435 0 0  
**Waddington** ..... 382 0 0  
**T. Watson, Dulwich (accepted)** ..... 355 0 0

**EGHAM.**—For alterations and additions to "Engle-green," Engle-green, Egham. Messrs. Elworthy & Son, architects, St. Leonards-on-Sea—  
**E. Gray, Egham** ..... £722 0 0  
**F. Harrison, Egham** ..... 617 5 0  
**A. Simpson & Co., Egham** ..... 581 15 0  
**Olsen Bros., Egham** ..... 549 10 0  
**W. Watson, Ascot** ..... 486 0 0  
**Hutt & Satchwell, Richmond\*** ..... 467 10 0  
 \* Accepted.

**FULHAM.**—For the erection of new chapel. Mr. Charles Bell, architect—  
**J. Allen & Sons, Kilburn (accepted)** ..... £3,330 0 0  
 [No competition.]

**HAMMERSMITH.**—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depot, Gloucester-road, under the superintendence of Mr. W. Eve, F.S.I., 10, Union-curt, Old Broad-street, E.C.—  
**Godfrey & Son** ..... £388 0 0  
**J. H. Johnson** ..... 382 0 0  
**Adamson & Sons** ..... 375 0 0  
**Harris & Wardrop** ..... 367 0 0  
**J. Holland** ..... 338 0 0  
**W. M. Dunn** ..... 328 0 0  
**F. & H. F. Higgs, (accepted)** ..... 313 0 0  
 Loughboro Junction

**HORNSEY.**—For machinery for sewage treatment at Board's Sewage Works, Irish-corner, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor—  
**H. W. Wilkinson & Co., Dockhead, S.E.** £294 0 0  
**S. H. Johnson & Co., Stratford, E.** ..... 467 0 0  
 \* Accepted.

**HORNSEY.**—For disinfecting apparatus at New Hage Hospital, Irish-corner, for the Hornsey Local Board. Mr. T. de Courcy Meade, engineer and surveyor—  
**J. W. Lyon, size A, 178 1/2; size B** ..... £373 0 0  
**Leslie, Edwards, & Norman** ..... 298 0 0  
**Bradford** ..... 287 0 0  
**Godard, Massey, & Warner, Nottingham** ..... 200 0 0  
**Crane** ..... 131 0 0

**HADLOW DOWN (Sussex).**—For alterations and additions (allowing for old materials) at Hadlow Grange, Hadlow Down, Sussex. Mr. Geo. H. Fellowes Prynce, architect. Quantities supplied by Mr. E. Henry Hale, surveyor—  
**Taylor Bros., Hastings** ..... £5,680 0 0  
**A. H. White, St. Leonard's** ..... 5,365 0 0  
**J. Martin, Eastbourne** ..... 5,300 0 0  
**B. Crutenden, St. Leonard's** ..... 5,042 0 0  
**A. Moon & Son, Rokerfield** ..... 4,835 0 0  
**J. & C. Bowyer, Norwood** ..... 4,690 0 0  
**G. Chaseman, Uckfield** ..... 4,498 0 0  
**Charwood Bros., East Grinstead** ..... 4,324 0 0  
**Mark Martin, Eastbourne (accepted)** ..... 4,200 0 0

**HIGHGATE.**—For alterations at The Cedars, Highgate-road, for Mr. D. P. Rogers. Mr. Edward Power, architect, 16, King William-street, E.C.—  
**Chas. E. Birch** ..... £1,471 0 0  
**J. W. Dixon** ..... 900 0 0  
**F. J. Corhead** ..... 834 0 0  
**S. Babey & Son** ..... 792 0 0  
**J. Dover (revised and reduced tender accepted)** ..... 350 0 0

**HIGH WYCOMBE.**—For the erection of new residence, Amersham Hill, for Mr. John Parker, F.S.A. Mr. Arthur Vernon, High Wycombe, architect—  
**Hyaters** ..... £3,900 0 0  
**Stanley G. Bird** ..... 3,108 0 0  
**Silver & Sons** ..... 3,081 0 0  
**Woodbridge** ..... 2,990 0 0  
**Grist** ..... 2,680 0 0  
**Claridge & Bloxham** ..... 2,650 0 0  
**Martin, Wells, & Co.** ..... 2,630 0 0  
**Snell & Co.** ..... 2,638 19 0  
**Flint & Maddoford** ..... 2,449 0 0  
**Loosley** ..... 2,341 0 0  
**Webster & Cannon** ..... 2,323 18 0  
**Hunt** ..... 2,293 0 0  
**Gibson (accepted)** ..... 2,240 15 0  
**Martin** ..... 2,240 7 10  
 \* Including Stabling and Walling.

**Stabling.**  
**Webster & Cannon** ..... £241 0 0  
**Stanley G. Bird** ..... 239 0 0  
**Silver & Sons** ..... 234 0 0  
**Claridge & Bloxham** ..... 231 0 0  
**Woodbridge** ..... 215 0 0  
**Grist** ..... 208 0 0  
**Gibson (accepted)** ..... 208 0 0  
**Snell & Co.** ..... 194 0 0  
**Martin, Wells, & Co.** ..... 193 14 0  
**Hunt** ..... 188 0 0  
**Martin** ..... 180 16 0  
**Flint & Maddoford** ..... 179 0 0  
**Loosley** ..... 174 18 0

**Walling.**  
**Stanley G. Bird** ..... £293 0 0  
**Silver & Sons** ..... 380 0 0  
**Grist** ..... 350 0 0  
**Woodbridge** ..... 345 0 0  
**Martin, Wells, & Co.** ..... 327 6 0  
**Snell & Co.** ..... 326 1 0  
**Claridge & Bloxham** ..... 307 0 0  
**Hunt** ..... 295 0 0  
**Loosley** ..... 286 19 0  
**Webster & Cannon** ..... 268 10 4  
**Flint & Maddoford** ..... 279 0 0  
**Martin** ..... 275 19 8  
**Gibson (accepted)** ..... 247 13 0

**KENSINGTON.**—For sanitary and decorative repairs at 53, Bart's Court-square, S.W., for Mr. Richard Chamberlain, M.P. Messrs. Morley & Lettis, surveyors, 185, Bart's Court-square, S.W.—  
**E. K. Wilson** ..... £249 1 6  
**H. Smith & Sons** ..... 244 0 0  
**F. W. Heath** ..... 240 0 0  
**Toten & Sons, Gloucester-road\*** ..... 225 0 0  
**Lavender & Sons** ..... 275 0 0  
 \* Accepted.

**KENSINGTON.**—For sanitary alterations and repairs at 6, Warwick-road, for the Hon. A. M. Forbes. Messrs. Morley & Lettis, surveyors, 185, Bart's Court-square, S.W.—  
**Toten & Sons, Gloucester-road\*** ..... £125 0 0  
 \* Accepted.

**KILBURN.**—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depot, Dyne-road, under the superintendence of Mr. W. Eve, F.S.I., 10, Union-curt, E.C.—  
**Godfrey & Son** ..... £230 0 0  
**Adamson & Sons** ..... 225 0 0  
**Harris & Wardrop** ..... 220 0 0  
**J. H. Johnson** ..... 215 0 0  
**J. Holland** ..... 210 0 0  
**W. M. Dabbs** ..... 198 0 0  
**F. & H. F. Higgs, (accepted)** ..... 184 0 0

**KILBURN.**—For completing three houses in Brondesbury-villas, under the superintendence of Mr. William Eve, F.S.I., 10, Union-curt, Old Broad-street, E.C.—  
**Avis & Son, 169, Holydale-road, Fack-**  
**ham (accepted)** ..... £291 0 0

**LINCOLN.**—For the erection of a pair of cottages, fruit and potato stores, and foundations of weighbridge, at the Canwick Irrigation Farm, for the Corporation of Lincoln, plans, specifications, and quantities supplied by Mr. R. A. MacBarr, City Surveyor—  
**W. Stothard, Billinghay** ..... £206 0 0  
**J. Greenham, Branton** ..... 688 12 0  
**Horton, Holmes, & Horton, Lincoln** ..... 683 0 0  
**J. W. Harrison, Lincoln** ..... 559 0 0  
**H. S. & W. Close, Lincoln** ..... 550 0 0  
**J. Crosby & Sons, Lincoln** ..... 535 0 0  
**J. Brooks, Lincoln** ..... 523 0 0  
**G. Cowen, Lincoln** ..... 518 0 0  
**J. H. Woodhouse, Lincoln** ..... 515 0 0  
**W. Reynolds, Lincoln** ..... 489 0 0  
**J. B. Harrison, Lincoln (accepted)** ..... 489 0 0

**LONDON.**—For new baths and washhouses in Buckingham Palace-road, S.W., for the Commissioners of Public Baths and Washhouses for the Parish of St. George, Hanover-square. Mr. F. J. Smith, architect—  
**Gaisford** ..... £234,041 0 0  
**Ramsay** ..... 31,340 0 0  
**Kirk, Knight, & Co.,** ..... 30,575 0 0  
**Shillito** ..... 30,467 0 0  
**Boyce** ..... 29,728 0 0  
**Chappell** ..... 29,720 0 0  
**Gentry** ..... 28,590 0 0  
**Kirk & Randall** ..... 28,424 0 0  
**Kynoch** ..... 28,385 0 0  
**J. Holloway\*** ..... 28,367 0 0  
**Bran & Sons** ..... 28,313 0 0  
**Mowlem & Co.** ..... 28,203 0 0  
 \* Rejected as informal. † Accepted.

**LONDON.**—For painting and other works at the Workhouse, Bromley-by-Bow, and to the Union Premises, Stepney, &c., for the Guardians of the Stepney Union. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. No quantities—  
**Collyer** ..... £248 0 0  
**Hadlow** ..... 433 0 0  
**Wylie** ..... 408 0 0  
**Barker** ..... 408 0 0  
**Stevenson** ..... 295 0 0  
**A. W. Derby, 21, Devon's-road, Bow\*** ..... 279 0 0  
 \* Accepted.

**LONDON.**—For gas-fittings for Mr. Parish, at "The Wellington," Strand. Mr. W. West, architect—  
**Steadman** ..... £173 14 6  
**Winn** ..... 169 19 6  
**Buckley & Beach** ..... 166 10 0  
**Heavens & Co.** ..... 160 10 0  
**J. Biggs, Bow-road (accepted)** ..... 151 10 0

**LONDON.**—For additions to hat manufactory, Bennett-street, Blackfriars-road, for Mr. Samuel Cooksey—  
**G. Phillips** ..... £212 10 0  
**G. Newton** ..... 206 0 0  
**W. & H. Castle** ..... 285 7 7  
**T. Simpson,\* 105, Borough, S.E.** ..... 275 0 0  
 \* Accepted.

**LONDON.**—For laying down new carriageways and York stone footways, and executing other works in connection therewith, for the purpose of widening Elm-street and a part of Gray's Inn-road, for the Metropolitan Board of Works. Sir J. W. Bazalgette, engineer—

|                      | Total. | Deduction for tramway. |
|----------------------|--------|------------------------|
| Rutty                | £4,900 | £230                   |
| Nowell & Robson      | 4,091  | 805                    |
| Biggs                | 3,700  | 600                    |
| Mowlem & Co.         | 3,490  | 710                    |
| Griffiths (accepted) | 2,800  | 720                    |

**LONDON.**—For proposed new factory, Pomeroy-street, Old Kent-road, Mr. Edward Power, architect, 16, King William-street, E.C.—  
**F. J. Corhead** ..... £3,950 0 0

**LONDON.**—For alterations and repairs to the Nag's Head public-house, 324, Hackney-road, N.E., for Mr. Charles Deakin. Mr. Arthur W. Saville, architect, 90, Strand, W.C. Quantities supplied—  
**G. Colls** ..... £1,300 0 0  
**S. Goodall** ..... 1,170 0 0  
**Drew & Cadman** ..... 1,146 0 0  
**Gould & Brand** ..... 1,143 0 0  
**Ward & Lambie** ..... 1,115 0 0  
**S. Yardley & Sons** ..... 1,125 0 0  
**W. Oldrey & Co.** ..... 1,114 0 0  
**Spencer & Co.** ..... 1,075 0 0  
**John Walker** ..... 930 0 0

**Pastor's Work.**  
**T. Heath** ..... 171 0 0  
**W. Rogers** ..... 170 0 0  
**Watts & Co.** ..... 148 0 0  
**W. Helling** ..... 145 0 0  
**F. J. Russ** ..... 131 0 0

**Gaffner's Work.**  
**Vaughan & Brown** ..... 63 2 6  
**W. Wint** ..... 56 0 0  
**E. Fraguell** ..... 52 10 0



LONDON.—For decorative and sanitary work at 8, Brondesbury-road, Kilburn, N.W. Mr. Melissa Joseph, architect, 17, Basinghall-street, E.C.—

|                 |           |
|-----------------|-----------|
| G. Cox          | £289 10 0 |
| A. W. Hammond   | 237 0 0   |
| J. Allen & Sons | 220 0 0   |
| W. M. Dabbs     | 189 0 0   |

LONDON.—For repairs at premises, 211, Hampstead-road, N.W., for The West St. Pancras Liberal and Radical Club Company. Mr. Arthur W. Saville, architect, 99, Strand, W.C.—

|                 |          |
|-----------------|----------|
| H. Hendy        | £188 0 0 |
| O. Cole         | 128 12 0 |
| J. Years & Co.  | 128 0 0  |
| J. Styles & Son | 120 0 0  |
| T. W. Morris    | 85 0 0   |
| F. P. Treweek   | 70 10 0  |

LUDLOW.—For new Town-hall, Public Market, and Corn Exchange, Ludlow. Mr. Henry A. Cheers, architect, Twickenham—

|                                   |            |
|-----------------------------------|------------|
| Ed. Gabbutt, Liverpool            | £7,157 0 0 |
| Wade, Ludlow                      | 6,989 0 0  |
| Wood & Soas, Worcester            | 6,943 0 0  |
| Jno. Groves, Shrewsbury           | 6,800 0 0  |
| D. C. Jones & Co., Gloucester     | 6,682 0 0  |
| H. Milward, Leominster            | 6,574 0 0  |
| Jno. Inwood, Malvern              | 6,558 0 0  |
| Jno. Williams, Knighton           | 6,500 0 0  |
| Jno. Gethin, Shrewsbury           | 6,389 0 0  |
| Thos. Foster, Aberystwyth         | 6,337 0 0  |
| Treasure & Son, Shrewsbury        | 6,298 0 0  |
| Shillitoe & Son, Bury St. Edmunds | 6,200 0 0  |
| T. Grosvenor, Ludlow              | 6,200 0 0  |
| Edwards, Leominster               | 6,180 0 0  |
| Jno. Fernal, Malvern              | 6,112 0 0  |
| Horsman & Co., Wolverhampton      | 6,100 0 0  |
| Samuel Warburton, Manchester      | 6,000 3 0  |
| F. Davies, Shrewsbury             | 5,987 0 0  |
| J. Jones & Son, Wolverhampton     | 5,750 0 0  |
| W. Bowers & Co., Hereford         | 5,543 0 0  |
| R. Price, Shrewsbury (accepted)   | 5,500 0 0  |

LUTON.—For new business premises, Wellington-street, Luton, for Mr. E. Deacon. Mr. W. J. Pearson, architect—

|                  |            |
|------------------|------------|
| Wright           | £1,178 0 0 |
| Dunham           | 1,843 0 0  |
| Parkins          | 1,830 0 0  |
| Ford             | 1,825 0 0  |
| Neville Bros.    | 1,590 0 0  |
| Smart            | 1,543 0 0  |
| Pryor (accepted) | 1,460 0 0  |

ORPINGTON (Kent).—For additions and repairs to private residences. Mr. St. Pierre Harris, architect, 1, Basinghall-street, E.C.—

|                 |          |
|-----------------|----------|
| C. Hudson       | £388 0 0 |
| Somerford & Son | 342 0 0  |
| W. Owen         | 337 0 0  |
| Low             | 320 0 0  |
| Johnson         | 289 0 0  |

RUSHDEN.—For the erection of new bakery at Rushden, Northamptonshire, for Mr. W. Hipwell. Messrs. Usher & Anthony, architects, Bedford—

|                             |          |
|-----------------------------|----------|
| Harrold, Bedford            | £260 0 0 |
| White, Bedford              | 930 0 0  |
| Knight, Rushden             | 910 0 0  |
| Benson, Wellingborough      | 890 0 0  |
| Hay, Rushden                | 890 0 0  |
| Brown, Rushden              | 888 0 0  |
| Adnett & Everard, Rushden   | 840 0 0  |
| Sparrow, Rushden            | 819 0 0  |
| Slupp, Rushden              | 800 0 0  |
| Foskett, Rushden (accepted) | 795 0 0  |

STAINES.—For alterations and repairs, &c., to house, Gresham-road, Staines, for Major Lane. Mr. Fitt, architect, Staines—

|                            |          |
|----------------------------|----------|
| Reavell, Staines           | £199 0 0 |
| Henley, Penge              | 180 0 0  |
| Baker, Staines             | 146 0 0  |
| Oades Bros., Egham         | 122 10 0 |
| Powell, Staines (accepted) | 120 0 0  |

STRATFORD.—For fitting up stabling at Messrs. Carter, Paterson, & Co.'s depot, Angel-lane, under the superintendence of Mr. Wm. Ede, F.S.I., 10, Union-court, Old Broad-street, E.C.—

|                             |          |
|-----------------------------|----------|
| Godfrey & Son               | £350 0 0 |
| Adams & Sons                | 327 0 0  |
| Harris & Wardrop            | 320 0 0  |
| J. H. Johnson               | 319 0 0  |
| J. Holland                  | 297 0 0  |
| W. M. Dabbs                 | 204 0 0  |
| F. & H. P. Higge (accepted) | 278 0 0  |

WATFORD (Herts).—For new stabling at the Rose and Crown Hotel, for Mr. F. Fisher. Mr. C. P. Ayres, Watford, architect—

|                          |          |
|--------------------------|----------|
| Andrews & Sons           | £968 0 0 |
| G. & J. Waterman         | 946 0 0  |
| H. M. Dove               | 898 0 0  |
| W. B. Neal               | 886 0 0  |
| C. Brightman             | 886 0 0  |
| T. Turner (Limited)      | 884 0 0  |
| Clifford & Gough         | 875 0 0  |
| Judge & James (accepted) | 863 17 0 |

Office, Clock-lane.—In reference to the announcement on p. 84 of the last number of the Builder, that Mr. T. Taylor Smith is the architect of the new block of offices in Clock-lane, we are asked to state that Mr. Edward Fowler is joint architect with Mr. Smith for the new building.

Warning, Amies-street Board Schools.—Messrs. William Jenkins & Son, of Leamington, write to say that their name should have appeared in the list of tenders for this work which appeared on p. 83 of the Builder for July 21. The amount of their tender was 500*l*.

SUBSCRIBERS IN LONDON and the SUBURBS, by preparing at the Publishing Office, 19a, per annum, or 4*s*. 9*d*. per quarter, can ensure receiving "The Builder" by Friday Morning's post.

#### TO CORRESPONDENTS.

C. E. (thanks).—O. A. we may have more to say on the subject, and will keep your letter in view, but we cannot regret the joint as any improvement on that already illustrated.—F. W.—W. & D. (thanks). We have forwarded your letter to "The Engineer" too late for this week. "Is a Fix" (should have enclosed name and address). We cannot recommend anything for colouring the stone, which is a very bad idea, and we should strongly recommend your client to let it alone, and leave it to time, which will operate much more beneficially.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding prices and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other matters should be addressed to THE PUBLISHER, and not to the Editor.

#### PUBLISHER'S NOTICES.

Registered Telegraphic Address, "THE BUILDER, LONDON."

THE INDEX and TITLE-PAGE for Volume LIV. (Jan. to June, 1888) was given as a Supplement with July 14.

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by the same hour on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISE-

SPECIALMENTS OR ORDERS TO DISCONTINUE same,

must reach the Office before TEN o'clock on WEDNES-

DAY morning.

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MONIALS, &c. left at the Office in reply to advertisements, and

strongly recommends that the latter SHOULD ONLY be sent,

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free of charge. Letters will be forwarded if addressed

envelopes are sent, together with sufficient stamps to

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BOX GROUND. | COMBE DOWN.

WESTWOOD GROUND. | STOKE GROUND.

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#### Asphalte.

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M. STODART & CO., Office:

No. 90, Cannon-street, E.C. [ADV.]

#### SPRAGUE & CO.,

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22, Martin's-lane,

Cannon-street, E.C. [ADV.]

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GEORGE GARSIDE, JUNR., Leighton Buzzard. [ADV.]

#### W. H. Lascelles & Co.

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IMPORTANT COMMUNICATION.—FIRE AT WHITELEY'S.

WILLIAM WHITELEY, Westbourne Grove, London, Oct. 12th, 1887.

GENTLEMEN.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers of your Strong-room doors and Safes.

The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new building now in course of erection.—I am, Gentlemen, faithfully yours,

Office and Warehouse: 76, CHEAPSIDE, London; Manufactories, Wharncliffe Works, Arlington-street, London, N.



# The Builder.

VOL. LV. No. 2778.

SATURDAY, AUGUST 18, 1888

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### The New Edition of Gwilt's Encyclopædia.



It is perhaps an indication of the encyclopædic nature of architecture itself, as a study and a profession, and the extent and variety of subjects which are included in it, that the production

of a comprehensive text-book or dictionary of architecture has been from time to time recognised as an object worth devoting the best part of one's life to, and has actually conferred name and fame on those who would otherwise have had no claim to the remembrance of posterity. Vitruvius, who could obtain (from his own account) no practical success in his own day as an architect, has been able by his book, which is a kind of concentrated encyclopædia of the art as practised in his day, to keep his name alive to distant generations, while those of his more fortunate contemporaries, who designed the temples and forums and triumphal arches of the day, are utterly lost. Viollet-le-Duc, now that his remarkable personality and acquirements are no longer in evidence before his generation, will live chiefly through his "Dictionnaire"; and Joseph Gwilt, who may be fairly called the English Vitruvius, though he has left his name on no great building, seems bidding fair to be remembered, through his book, longer than those who have.

His work is less attractive than that of Viollet-le-Duc, especially as regards the illustrations, which in the eminent Frenchman's work form a series of splendid sketches, half historic, half imaginative, of Mediæval detail of all kinds, drawn with a spirit and realism which is a proof how completely their author had entered into the meaning and character of Mediæval work. The scope of his "Dictionnaire," however, is, of course, very limited as compared with that of Gwilt's: for while the Frenchman only aimed at resuscitating (or illustrating the architectural ideas of a certain age and style. Gwilt formed the more ambitious idea of giving the groundwork for a study and knowledge of all the essentials of architecture, outside of the question of style altogether. This was also the scheme of Vitruvius, who however, besides being much more concentrated and terse in literary expression,

was hampered by a reverence for conventional rules which were in reality merely secondary conditions of architecture, but which he mistook for, or treated as if they were, primary ones. There is none of this in Gwilt. Architecture in his work is not a question of liking or imitating this or that style: it is a matter of scientific building, the various possible expressions of which are summed up and illustrated more or less, and their history and development sketched out, but with no attempt to recommend one more than another. Nor is there any appeal to the eye in the manner of illustrating and getting up the book, in the most recent any more than in former editions. The old illustrations in the historical portion of the book, the small engravings of various ancient buildings, which are still retained in the new edition, served to explain the text, but nothing more. The book has always been eminently a utilitarian one. A great many of the illustrations of detail,—in the articles on the orders, for instance,—are quite adequate and suitable, even from the point of view of the present day; they are in a different manner from that of contemporary architectural illustration, but they are not less carefully executed. Of the small woodcuts in the "History" portion, giving views of various ancient buildings, the same can hardly be said; some of them are very old-fashioned and meagre to modern eyes; yet we do not know that we should be prepared to recommend their removal to make way for more modern blocks. They have an interest as part of the old book, and we should be sorry to see a new face put on it.

It is not this portion of Gwilt, either, that is of most value now. Fergusson's much larger, more complete, and more fully illustrated history has superseded Gwilt as far as the historical portion is concerned, though the latter may perhaps be credited with a judicial impartiality which is not by any means so much illustrated in Fergusson. Gwilt simply recapitulates the heads of architectural history, with little either of recommendations of his favourite styles (if he had any) or criticisms on those he disapproved of; this makes it duller reading, no doubt, than Fergusson, but this attitude is much more suitable to the office of a historian, who is not called upon to be either a critic or a panegyrist. The value of Gwilt, however, lies in the immense amount of practical knowledge of all kinds bearing on building which is included within his pages. The book is not an æsthetic treatise, but a compendium of knowledge and science

bearing on the art of building. It is but twelve years since the last edition appeared, and we then devoted some space to a recommendation of the merits of Gwilt; but as a new generation of young architects has commenced to study and work since then, it may not be amiss again to draw attention to the value of the book to students of architecture, *à propos* of the appearance of a fresh edition.\*

Gwilt was essentially a scientific architect, and the main object of his work was to include in one treatise the body of scientific knowledge which is necessary to fit the architect for the practical exercise of his calling. Regarding the mechanics of construction as problems to be unlocked by the key of mathematics, his original treatise commenced, after the historical portion, with a section on algebra and arithmetic; a part of the book which has been discarded in subsequent editions, we presume as being a portion of general or primary education, and therefore not required in a book of special education. As the work now stands, Book II., on "The Theory of Architecture," commences with practical geometry, followed by a chapter on conic sections, and then proceeding to the main principles of mechanics and statics. Following upon this comes the practical application of geometrical science and mechanical principles to the questions of the stability of piers and vaults. In regard to a considerable portion of the discussion on the equilibrium of arches, Gwilt admits that he was indebted to Rondelet's "Art de Bâtir," the most noteworthy general treatise on building construction that has been written, but which had not appeared in English before Gwilt extracted a great deal of the substance of it, nor has it appeared in any direct translation yet. "Walls and piers," and "beams and pillars" are next treated of, and in this portion of the work the editor has embodied some of the results obtained by experiments since the date of the original publication; and in the present new edition a short section on steel is added, especially on the form of mild steel now so much in use. After the consideration of the mechanical and static principles of combining and building up materials, comes the more detailed consideration of the nature of the materials themselves, commencing with "Stone," embodying a variety

\* An Encyclopædia of Architecture, Historical, Theoretical, and Practical. By Joseph Gwilt, F.S.A., F.R.S.A. Illustrated with about seventeen hundred engravings on wood. New edition, revised, parts re-written, and with additions by Wyatt Papworth, F.R.I.B.A. London: Longmans, Green, & Co.; 1888.

of information as to the qualities and composition of various stones, with a very useful list of the most prominent building stones, with tables of their composition, colour, weight, cost (at the time of publication), and important buildings in which they have been used. This portion of the book is mostly an addition to the original Gwilt; it gives a great deal of information which perhaps has not been superseded, or at least contradicted, but which is derived from rather old authorities. For we find in Mr. Papworth's editing of Gwilt the same curious tendency which we noticed in his editing of the "Dictionary of Architecture," to ignore every source of information later than about twenty-five years ago. It is certainly odd, in an edition with the date "1888" on the title-page, to find nearly all the later authorities quoted are about 1860 or so. That the attempt to keep information of this kind up to date has not been very exacting is evident from the fact that paragraph 1671 *g*, commencing "Argyleshire has only within the last twenty years been opened up for granite," stands the same in the editions of 1876 and 1888. The editor might have found a good deal of fresh information about granite in the "Student's Column" of this journal for 1886; but that, we presume, is a quarter of a century too recent for him. One of the most odd inaccuracies in the book is the mis-quotation of the celebrated short sentence which closes the epitaph on Wren's tomb, and which, in the editions both of 1876 and 1888, is displayed (in the historical portion of the work) in large capitals across the page, as "SI QUERES MONUMENTUM, CIRCUMSPICE." This is quite wrong, and is, moreover, very clumsy Latin. We neglected to refer to the original edition of Gwilt on this head, and therefore cannot say whether it is Gwilt's mistake or Mr. Papworth's, but the fact remains that it has been passed by the latter in at least two successive editions. It surely might have been worth while to take the small trouble of a reference to the monument itself to verify so significant and celebrated a quotation. We give the sentence once again here, as copied from the monument two or three days ago:—

"SI MONUMENTUM REQUIRIS, CIRCUMSPICE," and now we hope it will not be mis-quoted again.

The sections on masonry and joinery, which form illustrated treatises of some length on these subjects, are admirable, and contain the pith of the subjects; the illustrations are very numerous and very useful, considering the limitations imposed by the small space available for cuts. We observe there is some important new matter added in regard to fire-proof construction, with some additional illustrations; and in regard to this subject and to marbles there are references to recent papers at the Institute on these subjects. The Board of Works' regulations as to concrete are also added, but we doubt if this is quite in place in a general work on architecture, which does not profess to take into consideration the customs or regulations of any locality. Similarly, in the model forms of specification given, it seems to us quite out of place to name the apparatus and materials of special makers, "Doulton closets" and "Tyler's boilers," &c.; that is not what a model specification in a book of general instruction is intended for. We observe that one or two of the names are the same now as in the 1876 edition; another indication that revision to date has been very incomplete. Considerable additions have been made to the specification department, however, which is modernised to some extent, but there is nothing as to specifying for electric lighting, which is an important matter now, except a mere list of how many knobs are to be fixed, and in what rooms. A short chapter has, however, been added elsewhere on electric appliances. Generally speaking, we do not attach much value to model specifications; they appear to us to furnish an opportunity to unpractical architects to go through a form of specifying without properly understanding what they are doing. It is desirable, of course, for a young practitioner to know the usual

technical way of putting things, so as not to speak to the builders in an unknown tongue; but the specification chapter in the new edition does not exactly give the specification phraseology, it is rather a statement of what he ought to specify than how to put it. And what he should specify should be the outcome of his own knowledge and his own intention as to what his building is to be; model specifications tend rather, as far as they have any influence, to keep things in a groove.

Some additions have been made since 1876 to the chapter on ventilation: that on warming seems to remain as it was. Nothing is said in it, we observe, about the method of heating by radiators in the basement warming the column of air ascending to the rooms, a method of combining warming and ventilation which has been found to have great advantages, and has been carried out very systematically in some recent large buildings.

Under the title "Practice of Architecture," Gwilt included a good deal which some persons in the present day would be rather disposed to call "Theory of Architecture," and even to quarrel with under that name. Under this head are included, for instance, considerations of the rules whereby the proportion of designs may be adjusted, concerning the necessity of which there have been many differences of opinion. A part of the treatise which is occupied with this subject of proportion is, however, of great interest, as it deals partly with the proportions between solids and spaces, and it is well worth careful attention as bringing before the mind of the architect a great deal of matter for thought in regard to the disposition and spacing out of the parts of his building.


The edition of "Gwilt" published in 1876 contained 1,395 pages; the new edition contains 1,443; of course there is a good deal in both editions which was not in the original Gwilt. It is a question whether it would not have been better to have issued it in two volumes. It is probably kept in one partly for economy and partly, perhaps, for prestige, as it always has been in one volume; but the volume has now become inconveniently bulky, and we should advise the issue of the next edition in two volumes: it will be more convenient. It is also a question to be considered, whether the modernization of those portions of the book which deal with changeable subjects should not be carried out in a more thorough way than at present, if possible, but rather by substitution than by addition. In matters such as warming and ventilation, for instance, where new methods are constantly coming in, it is not worth while to keep in type recommendations and information which are now out of date, and add fresh matter to them; a process which would lead to a perpetual enlargement of the book, and also destroy its due proportion of arrangement and amount of matter. In future editions what is out of date in these "changeable" portions should be rigidly excised, and the requisite new information given.

It is not in these changeable portions, however, that the real value of "Gwilt" lies. The valuable element of the book consists in the remarkable extent and variety of information in regard to the permanent scientific basis of architecture which is comprised between its two boards, and in the painstaking and thoughtful way in which the whole has been planned and laid out by its original author, who, in the spirit of a true architect, built up his book as he might have designed a building, on a solid basis and with a compact and logical order of arrangement. A special value of the work at the present day is that it is one that tends to draw the young architect from that flowery and sentimental view of his profession which is too common at present, and lead him to regard it in what we certainly think the more true and more serious light, as the art of solid and scientific construction, of which beautiful detail is the efflorescence, not the "final cause." There is so much at the present day of drawing and sketching sketching of new, and sketching from old,

\* See Gwilt's preface to the original edition, in which he especially draws attention to his views as to the logical and systematic arrangement of the whole.

buildings—with little consideration of what ought to be below all this, that there is something wholesome and strengthening in the manner in which Gwilt calls the attention of the reader to the essentials of architectural construction:—"It is to be lamented that, among the many able writers on Gothic architecture, details, more than principles, seem to have occupied their minds. The origin of the pointed arch seems to have entirely absorbed the attention of a large proportion of them, whilst others have been mainly content with discussions on the peculiarities of style at the different periods, and watching with anxiety the periods of transition from one to another. Foliage, mouldings, and the like have had charms for others: all, however, have neglected to bestow a thought upon the grand system of equilibrium by which such stupendous edifices were poised, and out of which system a key is to be extracted to the detail that enters into them." There speaks the true and born architect: and we recommend to the young and enthusiastic sketcher of the day to purchase his Gwilt as a book that no architect's library can be without, and the original portions of which are a mine of information in regard to the scientific and practical basis of the profession of architecture.

#### A WORD MORE ON THE QUANTITIES QUESTION.

 E print in another column three letters on the subject of the questions recently suggested in the case of Priestley & Gurney v. Stone, in regard to which another word or two may perhaps usefully be said.

Two of these letters are from legal correspondents, and they afford a curious example of the difficulty of getting the legal mind to understand that there is any other possible view as to what is fair and reasonable between one man and another except that afforded by the conventional standard of the law. Our correspondent, "A Barrister," appears to have mistaken the bearing of our previous article (August 4) throughout. We were not arguing as to what was the law, which is not our business, but as to what is reasonable and fair towards all parties; and we quoted the judgment of one or two "capable text-writers on architecture," as our correspondent phrases it, to show, not what is the law, which is not the point, but what is the conviction of men of experience as to the true position and the moral responsibility of the quantity surveyor towards both the building-owner and the builder; that inaccuracy in his quantities must cause injury and loss to one or the other, according as the inaccuracy is in the direction of fulness or of deficiency; and that, inasmuch as the quantity surveyor is, according to present practice, in this position between the two, he is morally and logically liable to both of them. That he is not legally liable is a mere question of legal mechanism, not of abstract right.

The persuasion of both our legal correspondents—Mr. Spokes and "A Barrister"—that the quantities do not constitute any undertaking that they are correct, and the reasons given for this by "A Barrister," precisely illustrate our previous argument, that the lawyers do not understand what quantities mean, and that it is far better to refer disputes of that kind to a professional arbitrator who does know what they mean. "A Barrister" compares the case of the quantity surveyor to that of a physician who "does not guarantee that his prescription is absolutely right, but only represents that he has brought care and skill to the work." "A Barrister" could hardly have given a more unfortunate illustration of the logic of the law. There is absolutely no parity of reasoning whatever between the two cases. The prescription of a physician is the result of a skilled opinion as to what is best for the cure of a particular ailment, but an opinion which is open to argument and discussion, and as to which a dozen physicians may each reasonably hold and maintain his



on separate opinion. A bill of quantities is a statement, based on measurement and calculation, of the quantity of materials contained in certain work. To give a simple instance, there is a cornice, we will say, of a certain depth and section shown round the building on the architect's elevations. It is measured by the surveyor and stated to contain 127 "feet run" and ten litres. That statement is right or it is wrong. There is no room for argument or difference of opinion in the matter. Quantities mean accuracy; that is what they are for. An experienced builder can give a pretty fair estimate from a study of the drawings and specification. Accuracy of estimating requires, however, measurement and a tabulated statement of the results of measurement, which is called a bill of quantities, and the special object of which is accuracy in facts and figures. If the quantities are not accurate they are not "quantities." The real analogy would be not between the quantity-taker and the physician, but between the quantity-taker and the chemist. Would "A Barrister" argue that the chemist who makes the physician's prescription makes no presentation that it really contains the quantities and proportions of drugs specified? That the legal and the actual conditions are compatible we have already implied. The criticisms of "A Barrister" are purely negative, and suggest nothing towards improvement in the future. Our other two correspondents make definite suggestions. Mr. Pokes suggests a declaration on the part of the quantity surveyor that the quantities are accurate, and an agreement to make good deficiencies. The guarantee is, in our opinion, unnecessary verbiage, and the agreement to make good deficiencies is too like making an invitation to the contractor to find a case against the surveyor. Another suggestion is that which we have had made in a private letter from another lawyer: "Is it not possible to insert a contract between the owner and builder that, in the event of any serious error in the quantities, compensation shall be allowed on their side?" This, on the other hand, is letting the surveyor go free, and exonerating him from the consequences of his errors. Mr. Pokes further suggests the plan of making the quantities a part of the contract, as is, in fact, often done. Mr. Humphris joins with us in recommending arbitration in case of dispute, calling attention also to the great importance of accuracy and clearness in the architect's plans and specifications in the first instance, in which we entirely agree with him; and he adds a suggestion that the contractor should be required, before tendering, to satisfy himself as to the accuracy of the quantities, "and certify accordingly." The reply of the contractor would probably be that he has not time, and that the quantities are prepared on the part of the building owner to save the time which would otherwise be occupied by the builders each taking out their own quantities, and that a rule requiring him to test them and certify would be logical and unfair to him.

There are objections to all the courses proposed, except that in regard to the value of professional arbitration. All are more or less logical, because all ignore the real meaning and origin of quantity-taking. We have always maintained, in spite of the prominence into which of late years this bogey of quantities has been brought, that the quantities are a reality the business of the contractor, and of him alone. The building-owner wants a building according to his ideas and the plans which he has approved, and wishes to know the cost beforehand; how many cubic feet of this or that material go to it is nothing to him. The architect wants his design properly carried out; the exact quantity of material it includes is nothing to him either; he makes his design independent of any such consideration. To the contractor alone it is of consequence to know the precise amount of material required, because he has to calculate the cost, so as to leave himself a profit. Let the builders, then, who are invited to estimate, themselves select and commission a quantity surveyor, and pay him in any way

agreed upon among themselves; leaving only the proviso that a copy of the quantities be supplied to the architect, so that he, on behalf of his client, may keep an eye on the whole procedure. If it be said that this will lead to collusion among the builders tendering, the answer is that if they are respectable it will not; and if they are not respectable they had better not be employed. That we believe to be the true common sense of the matter. It is very much opposed to recent practice, but it is the only way of putting the saddle on the right horse. It is the builder who wants the quantities; neither the building owner nor the architect want them; let the builder order them.

NOTES.

**T**HE Institute of Architects have issued a useful paper of "Hints to workmen engaged on the repair and restoration of ancient buildings." The main object of these hints appears to be that they should operate as cautions to the workmen when working in the absence of the architect who has the restoration in hand. The hints are directed towards impressing on the workman the real object of his work on ancient buildings,—that it is to preserve and bring to light the old work, not to substitute new. The remarks are all in the direction of conservatism, but are expressed with moderation, and not with the exaggerated solemnity of tone which we find in some other circulars on the subject of restoration; and they are probably on this account the more likely to command the attention of those to whom they are addressed.

**W**E have just received from the Office of the Metropolitan Board of Works the Superintendent Architect's thirty-second annual report on the Monthly Returns of District Surveyors, with abstract of fees received during the year 1887. From this report we learn that the total of the gross fees received during last year was £1,183*l*. 1*s*. 9*d*., in respect of 25,342 works, of which number more than three-fourths were completed within the year. There are at present 72 districts. The gross fees received in 47 districts varied from 23*l*. to 571*l*. (in one of these districts the receipts did not amount to 100*l*.); in five districts the receipts were less than 200*l*. each; in five, less than 300*l*. each; in eight, less than 400*l*. each; in fifteen, less than 500*l*. each; and in thirteen, less than 600*l*. each. In twenty-five districts the receipts ranged from 60*s*. to 1,455*l*. The expenses of the district offices amounted to 10,083*l*. 15*s*. 5*d*., and the sums abated or lost reached a total of 3,108*l*. 0*s*. 3*d*. As will be seen by the following figures, last year's returns show an increase over the last two years in the number of works, although the figures do not come up to those for the years 1880, '81, '82, '83, or '84:—

| Year. | Works. | Fees received. |
|-------|--------|----------------|
| 1856  | 14,654 | £19,904 14 11  |
| 1857  | 15,330 | 20,969 11 4    |
| 1858  | 15,500 | 21,732 11 2    |
| 1859  | 15,558 | 22,335 9 2     |
| 1860  | 15,030 | 22,791 2 3     |
| 1861  | 14,008 | 21,583 2 8     |
| 1862  | 15,707 | 25,315 2 3     |
| 1863  | 17,954 | 29,440 0 0     |
| 1864  | 18,984 | 31,803 5 2     |
| 1865  | 19,251 | 32,972 5 9     |
| 1866  | 20,196 | 34,949 11 4    |
| 1867  | 21,303 | 36,974 8 0     |
| 1868  | 21,915 | 37,720 13 5    |
| 1869  | 19,947 | 33,246 19 6    |
| 1870  | 18,899 | 30,003 2 4     |
| 1871  | 18,948 | 29,099 0 6     |
| 1872  | 18,298 | 28,502 10 6    |
| 1873  | 17,354 | 28,038 8 2     |
| 1874  | 19,950 | 30,322 0 2     |
| 1875  | 20,233 | 32,725 15 10   |
| 1876  | 21,010 | 36,533 16 5    |
| 1877  | 24,238 | 40,349 8 6     |
| 1878  | 24,529 | 42,043 9 0     |
| 1879  | 27,271 | 46,147 0 11    |
| 1880  | 29,249 | 49,796 10 11   |
| 1881  | 29,275 | 51,383 11 10   |
| 1882  | 28,519 | 50,281 5 6     |
| 1883  | 26,479 | 46,441 19 10   |
| 1884  | 26,383 | 46,732 11 6    |
| 1885  | 23,982 | 41,898 4 2     |
| 1886  | 24,541 | 41,041 0 3     |
| 1887  | 25,342 | 41,183 1 9     |

How far this increase is to be taken as indicative of increased activity in the building trade it is not easy to say without knowing the nature of the works enumerated. The "additions, alterations," &c., in some districts bear a large proportion to the number of new buildings, and, while many of them were no doubt comparatively trivial, others were doubtless of greater extent in magnitude and cost than some of the "new buildings." The smallest net revenue derived by a District Surveyor from his office was in the district of the detached portion of Clerkenwell, near Muswell-hill; the net amount received here was 21*l*. At the other end of the scale, the largest amount of net revenue received by a District Surveyor was in the district of Clapham and South Battersea, where the net amount received was 1,250*l*. 8*s*. 4*d*.

**T**HE Crystal Palace School of Practical Engineering, of the progress of which our readers have been informed from time to time by reports which have appeared in our columns, is an institution eminently deserving its name and the success which it has achieved. We report in another column the proceedings which took place on Saturday last in connexion with the close of the Summer term, when Mr. A. T. Walmisley, President of the Society of Engineers, occupied the chair, and presented the prizes to the successful students. From an inspection of the work done by the students we can heartily endorse the encomiums passed upon it by the Chairman and by other speakers at the meeting. A pleasing feature of this gathering was the enthusiasm with which the students (past and present) of the School greeted the Principal and the teachers of departments, which was only excelled by the generous applause given by the students at large to the prize-winners. These and other evidences of the existence of a genuine *camaraderie* speak well for all concerned. The school occupies four or five of the lowermost floors of the South Tower, which, although light and airy, are in some respects very inconvenient for work and study. The hope was fervently expressed that at no distant date the Directors of the Crystal Palace will be able to give effect to what we understand to be a long-cherished desire on their part—viz., to provide better and more suitable quarters for this important School of Engineering. But, judging from the remarks addressed by the Chairman of the Crystal Palace Company to the shareholders, a few days ago, the "good time coming" for the Company, as well as for the School, is not likely to arrive until the competing exhibitions of Kensington and Brompton have ceased from troubling.

**O**N February 26th, 1887, we adverted to the sale of the Jervaulx Abbey estate, in the North Riding of Yorkshire. We now hear that by direction of the late James, seventh and last Earl of Cardigan's trustees, who are lords of the manor, the beautiful ruins of Kirkstall will soon be put up for sale at auction. The abbey had its origin in the establishment, *temp.* Stephen, by Henry de Lacey of a band of Cistercian monks from Fountains, at Barnoldswick (1147). After four or five years' uncomfortable sojourn there, the monks prayed that they might be allowed to remove to a more likely spot in Airedale, in the West Riding, and distant about three miles and a quarter from Leeds. This was obtained for them by William de Poitou, and there, on the river's left bank, they began, in 1162, to build their now famous abbey of Kirkstall,\* which they dedicated to St. Mary the Virgin. As originally designed, the central tower did not rise to any great height above the high-pitched roof. In the beginning of the 15th century a belfry was added to the tower, and other alterations were subsequently made. The belfry and part of the tower fell to the ground one night in 1779; an accident

\* Probably the abbey gave the name to the site, Kirkstall being apparently "Kirches-thal," i.e., church valley: one of the many traces of the German form of a word in old English.



that has contributed no little to the "picturesque" aspect of the ruins, which have suffered from time to time at the hands of depredators and marauders. Hard by is Kirkstall Forge, whose ironworks are reputed to reckon amongst the most ancient in England. On the Dissolution, the site of the abbey was granted by Kings Henry VIII. and Edward VI. to Archbishop Cramer and his heirs; its then revenues are computed, by Speed, to have been worth £512. 13s. 4d. a year; Dugdale's assessment is less, being £329. 2s. 11d.

**T**HE somewhat bald north elevation of the Edinburgh University, which originally fronted a narrow lane, and which is now fully exposed to view by the opening up of Chambers-street, is to receive some improvements so as to bring it more into harmony with the other three façades than at present. There are four bays which slightly project, and three of them are to be re-dressed, and the joints and beds of the stones of the first-floor over the basement are to be rusticated so as to correspond with the easternmost of the four. The ornamental string-course, which is only returned over the easternmost bay, is to be continued along the whole line; and the iron railing and parapet at the front elevation are to be removed. The latter operation will, it is believed, not only give additional breadth to the footway of South Bridge-street, but add to the dignity of the elevation. Mr. Hutcheson's bronze statue of "Aspiring Youth," which is to surmount the lantern of the dome, is at present on view in the quadrangle, and preparations are in progress for placing it *in situ*. While speaking of Edinburgh, we may mention that the buildings for the Technical College are completed so far as regards the exterior, thus completing the range of Chambers-street. The statue of Dr. Chambers, which is to occupy a site between the Technical College and the Museum of Science and Art, has been entrusted to Mr. Birnie Rhind, sculptor.

**T**HE last issue, vol. ii., Puntata iii., of the "Museo Italiano di Antichità Classica," which is published at irregular intervals under the Editorship of Professor Compagnotti, appears in enlarged form. The text is accompanied for the first time by an atlas of twelve phototype plates. The whole number is devoted to the full publication and discussion of the discoveries recently made in the ancient grotto of Zeus on Mount Ida in Crete, and it forms, assuredly, a very important chapter in the history of Phœnician art. Undoubtedly the most remarkable objects among the discoveries are the series of votive shields adorned with various mythological and decorative subjects,—*e.g.*, a figure of Melkart in the "animal taming" scheme, and Astarte Anaitis with lions and sphinxes. Sometimes it is very difficult to determine whether the subjects are mythological or merely decorative, as in the case of the "Bird shield" (*scudo dall' uccello*), where the huge figure of a bird is surrounded by smaller lions and sphinxes. Some interesting specimens of the familiar Phœnician bowls have also come to light. On one fragment is depicted a scene of worship,—probably of the Oriental Aphrodite, Astarte-Anaitis. A chorus of women dancing with linked hands are preceded by two women-figures bearing offerings of fish and birds. We can only further notice a very curious and early bronze representation,—no doubt, votive,—of a ship; in the prow is set up a rude xoanon,—no doubt, of the god and goddess who directed the voyage. Near it stands the helmsman. To those who see in Crete the home of the earliest autochthonic art, it will, no doubt, be a disappointment that nearly all the objects found in this seat of early Zeus worship bear unmistakable traces of Oriental influence; the art is Phœnician, and of the Assyrio,—not the Egypto-Phœnician, kind. All archaeologists alike will regret that among all the curious, and in some respects unique, monuments here published, not one is inscribed. Almost the whole collection remains in the Museum of the Syllagos at Crete.

**T**HE *Bulletin de Correspondance Hellenique* (May-November, 1888,) contains two papers of general interest. In the first, M. Lechat gives a full account of the recent excavations at the Peireus. These excavations, it will be remembered, were begun in the hope of finding Conon's temple of Aphrodite, mentioned by Pausanias. This hope has been disappointed, but, instead, the excavators have come upon very interesting remains of the fortifications of Conon, on the promontory of Etioneia, including the principal gate, flanked by two towers. M. Lechat gives a ground-plan of the discoveries. The remains can, fortunately, be dated not only by the style of the masonry, but by the evidence of two inscriptions, which show that the rebuilding of the walls was carried on from 394-391 B.C. The second paper we would note is by M. Fongères, and deals with a bas-relief recently found in the French excavations at Mantinea. The style is of the fifth century B.C., and if M. Fongères be correct in his interpretation, the subject is unique. The bas-relief is unfortunately only half-preserved. The part remaining represents a maiden standing near the fragment of a palm tree, and holding in her hand a curious two-lobed object, which M. Fongères believes to be the liver of an animal. If so, she represents, in all probability, a priestess about to take the omens. We must own that a casual glance at the original left us with the impression that the object held was an ill-carved bird, an impression M. Fongères rejects. It is a question that can scarcely be decided except face to face with the original.

**T**HE forthcoming sale of the Queen's Park Estate, Kemp Town, Brighton, by order of trustees under the late Mr. George Duddell's will, includes the Royal German Spa, whereof the lease expires on January 1st, 1921, and Duddell's villa. This latter was built by King William IV. for Queen Adelaide. It stands within its own grounds at the northern side of the park, and has two lodges, stabling, hot-houses, &c. The entire property extends over 36 acres. With the exception of the Spa, it is all in hand, and if not bought in one lot, will be offered in separate plots to meet the convenience of purchasers.

**O**N Sunday, November 21st, 1886, St. Bride's, Fleet-street, was re-opened for divine service, after extensive renovation and decoration of its interior. About five o'clock in the afternoon of Friday, July 15th, 1887, the spire narrowly escaped destruction by a memorable stroke of lightning, which, however, expended its force beneath the stone-paving at the base of the tower.\* It was thought that the communication of the conductor with the ground was defective, and subsequent examination showed that many of the fastenings of the conductor down the steeple had become worn and insecure. These faults have been remedied; and within the past few weeks workmen have been employed in re-gilding the ball and vane, and in restoring the outer stonework of the tower and its spire.

**A** CHESHIRE correspondent of the *Times*, writing in regard to the recent racing to Scotland by three large railway companies, draws attention, and, we think, not without reason,—to the hard measure meted out to those who live near even some of the larger provincial railway stations by the constant increase in the number and the speed of express trains, the latter end being, of course, partly attained by striking out as many as possible of the provincial stopping-places. He complains that the many are thus inconvenienced and deprived of good trains for the sake of the few, and suggests that it is not even the best way to make railways pay, and that the fast trains are often seen to pass, half empty, a station where a number of passengers would be only too glad to be picked up, and who are left to wait for a slow train. Having a great appreciation of

fast trains ourselves, we nevertheless think Mr. Parr's objections have reason in them, and suggest a side of the travelling question which is in danger of being overlooked.

#### PIGS OF ANCIENT LEAD IN BRITAIN.

**J**UDGED by their rarity, ancient leaden remains should be of great value. Apart from the coffins and funerary canisters, pipes for water-supply, plates for lining or covering baths, acorn-shaped sling bullets, and a few other objects which the Romans, during their sway over Britain, manufactured out of this metal, there is an important class of relics consisting of "pigs," or slabs, bearing, for the most part, names of emperors, combined with other interesting formula. Probably no class of Roman antiquities has a larger claim upon the notice and consideration of the archaeologist. They materially assist our researches into the trade and commerce, the arts and sciences, even the very names of the British tribes who produced them for their Imperial masters. Many antiquaries have recognised the important character of the leaden pig, and it possesses a right to stand in the first class among the vestiges which the Roman age has left behind among us. Ward in 1757, Yates in 1858, McCall in 1863, Procter in 1869, and several others, have written on this subject, but perhaps the most critical notices are those of the late Mr. Albert Way, in 1859, and Dr. Emil Hübnér, of Berlin, in 1873, each of whom has catalogued all the examples extant up to the date of their publications. A few additional examples have been exhumed of late years, and the total number of pigs bearing Imperial inscriptions, with a few of cognate character added, is now fifty.

It will be convenient to examine these, as far as possible, in order of date. The oldest may be attributed to the early year 49, which places it among the oldest Roman inscribed objects of any class found in Britain. It was found not far from Wokey, or Wokey, Hole, near Wells, Somersetshire, during the reign of Henry VIII. The size and weight are not recorded, but they may easily be conjectured from the succeeding examples. It bore the inscription:—"T. CLAUD. CÆSAR .AVG. P.M. TR. P. VIII. IMP. XVI. DE .BRITAN." The name and titles of Tiberius Claudius Cæsar Augustus, Pontifex maximus, are here followed by his Imperial dates, and conclude with the phrase *de Britannia*, which shows that the refined produce of some, at least, of the lead-mines of Britain was looked upon as belonging to the Emperor or State, and not as a private possession. Under what circumstances they were worked, whether by slaves, criminals, or other forced labour, or by any kind of farm or concession, is not now clearly known; but the probability is that the subjugated Britons in lead-producing districts were required to furnish certain quantities of native lead, and it was not of much moment to their masters how it was produced. Two pigs, which will be noticed further on, bearing private names, appear to show that all the mines were not in public hands. The next pig in order of date, probably to be attributed to the same early year, 49, was found near Blagdon, on the northern flank of the Mendip Hills, a site notably rich in lead, in 1853. This bears a slightly imperfect inscription:—"BRITANNIC . . . AVG. P. . . ." which has been interpreted to refer to Tib. Cl. Britannicus, the son of Claudius and Messalina. Way places this pig even before the preceding one, and points out that Britannicus was thrown out of his short tenure of the purple power by the intrigues of his stepmother, Agrippina, in A.D. 48; but Hübnér interprets an indistinct inscription on the side of this object, which is now preserved in the British Museum, to refer to the initial letters of the names of certain consuls known to have held office in A.D. 49. The shape and size of the pig is, with little variation, conventional and common to all. It is that of a truncated pyramid with rectangular parallelogram-shaped base, 24 in. by 6 in. The smaller or top side is 3 in. wide; the weight is 153 lb.; the inscription is cast along the top in relief in bold Roman capital letters in a sunk panel with raised border. Five other pigs, bearing identical inscriptions, belong to the age of Claudius. Of these, one comes from Matlock, Derbyshire, found in 1787, measuring 20 in. long side of base, 17½ in. top side, and weighing 173 lb. The other four are from Broomer's Hill,

\* See *Builder*, July 23, 1887.



Pulborough, Sussex, found a little to the east of the well-known "stone-street," an ancient Roman way from Chichester to London, in 1824. These measured about 23 in. by 6½ in. base, 4½ in. high. One of them is in the British Museum. The inscription on each of these five is,—*"T. T. L. TR. LVT. BR. EX. ARG."*; and its explanation has given rise to several suggestions. Some read, "Tiberi Claudii tributum lutum Britannico ex argento,"—i.e., "tribute paid out of British money." Way inclines to see in "LVT." a reference to *Lutudarum*, the name of a Roman station, given in the list compiled by the anonymous seventh-century author known as *Ravennas*, where it occurs next to *Derwentio*; *Lutudarum* is now *Chesterfield*, according to Way. The late Sir Henry Ellis conjectured the reading "Lutudari Brigantum ex argenti"; Hübnér reads, "Trophimi Lutense," but this is far-fetched. It may be, however, that in "LVT." we have a hitherto unknown British word for *lead*, comparable with the Welsh *llud*, pure ore, *lludw*, ashes; the Latin *lutum*, loam; the Dutch *lot*, a plummet; and the English *lode*, a vein of ore. The concluding words of the inscription "*EX. ARG.*" *ex argento*, are explained by Pliny's description of *lead*:—"plumbum nigrum sepe cum argento nasci mixtique venis conlari." "Lead is often found with silver and produced in mixed veins"; and "*ex plumbo nigro argentum fieri*," "silver is made from lead."

The reign of Nero contributes only one pig to the imperial series, dated about the year 59. It was found on the verge of Broughton Brook, near Stockbridge, Hants, in 1783, weighing 156 lb., with the following dimensions: base, 24 in. by 5 in.; top 31 in. by 3½ in.; 5 in. thick. The side bears the inscription: "*EX. ARGENT.*" which has been already explained, and "*CAPASCS XXX.*" conjectured to refer to the weight. Nothing, however, is known of the *capascs* (? basket), which, according to this pig's weight, would be a little over 5 lb. *avordupois*, but the terms used in the weighing of lead always have been obscure, peculiar, and exclusive. Twenty-five pigs, bearing the imperial name of Vespasian, show that during this reign of about ten years a considerable activity was going on in the lead-mines of Britain. One of these, weighing 224 lb., found at Charterhouse, in the Mendips, in 1876 (a site which had already yielded a pig of Britannicus), bears the inscription "*IMP. VESPASIAN. AVG.*" and on the side "*BRIT. EX. ARG. VI.*" an expression which may be intended as reading "*Britannicum ex argento vivo*." If this is to be taken as indicative of the employment of *argentum vivum*, or quicksilver, in the manufacture of lead, it is a remarkable addition to our knowledge of Roman metallurgy; for, according to Pliny, the lead-workers of his day obtained lead only by one of the two following methods. Either it was derived from its own pure vein without admixture, or it was found with silver and melted while mixed with that metal. The part first liquefied was *stannum*, perhaps a kind of base pewter or tin; that which flows next was silver; the residue was *galena* or *molybdæna*, which is the third part of the vein. This being again melted yielded *plumbum nigrum*, or lead metal. To this ancient process, if the interpretation proposed be accepted, may now be added the separation of the ore from or by means of quicksilver, and its refinery,—for the silver was often, indeed, the object of the enterprise.

The abundance of lead in Britain seems to have given rise to a law restricting the output of the metal, which found a ready use for pipes, sheets, plates, and other articles of merchandise. The Roman octagon bath at Bath, for example (recently injured), was lined with sheet-lead weighing 30 lb. to the square foot; its dimensions were about 50 ft. by 40 ft. The same site of Charterhouse, in the Mendips, yielded a second pig of Vespasian; another was found at Boughton, Cheshire, in 1838; others at the Roodeye, Chester, 1886; Hints Common, Staffordshire, 1772; and the Cheshire coast, 1607. Those from Boughton, the Roodeye, and Hints bear on the side an inscription: "*DE CEANGI.*" and "*DE CEANG.*" This has been, by some antiquaries, explained to indicate that the lead came from the territory of the Ceangi, or Cangi, a British tribe of North Wales, in the vicinity of Chester, noticed by Tacitus; but perhaps the site of Congleton, in Cheshire, on the Roman Road, and on the direct way between Chester and the lead-mines of Derbyshire, may be in some way connected with this word.

The word in the Roodeye pig of lead seems to terminate with an L, but the horizontal limb of the letter is indistinct, or rather not in such high relief as the rest of the word. In some of the inscriptions referring to Vespasian, such as "*IMP. VESP. VII. T. IMP. V. COS.*," the T has been read as the initial of Titus, who was associated with Vespasian in the supreme power, but it seems unusual that an emperor should be designated by a single initial letter, and the position of IMP. after instead of before the name is inadmissible: the T may, perhaps, refer to the tribuneship of Vespasian.

The Emperor Domitian's name and titles appear on several pigs found on the Cheshire coast, with some bearing the name of Vespasian, in 1607; and also on one found at Hayshaw, near Ripley, in the West Riding of Yorkshire, in 1734. The latter bears also a side inscription,—*BRIG.* for *Brigantibus*,—from the country of the "Brigantes." Hadrian's reign contributes seven pigs from Wirksworth, Derbyshire, found in 1777; Westbury, Salop, 1796; Bishop's Castle, in the same county, 1767; Aston, between Shrewsbury and Montgomery, 1775; Snead, Salop, 1851; Sydney-buildings, Bath, 1822; and Ministerley, Salop, 1851. That found at Wirksworth, the lead mining of which place was maintained in Saxon times (for in A.D. 835 lead was supplied from this site for the repairs of Christ Church Cathedral, Canterbury) is of interest, for it bears the inscription "*MET. LVT.*," of which a new interpretation has been suggested in a previous paragraph. It weighed 127 lb., and measured 22 × 5½ in. The Westbury pig weighed 193 lb., that from Bishop's Castle 190 lb. These weights do not appear to be uniform, although Dr. J. Phillips, of Oxford, refers them to aliquot parts of the modern pig of 176½ lb. It is not unlikely that they were not all cast at one fusing, for some of them show stratifications or laminations, as if the mass were added to at different times; and possibly they were broken up or subdivided for use by splitting off the separate layers. According to Pliny, the price of pure lead was seven denarii for 100 lb. The pigs of latest date belong to the period of Antoninus, between A.D. 139 and 161, one of which has been described by Way and Hübnér; another, bearing the inscription of the two emperors Antoninus and Verus "*Armeniacorum*," was found at Bruton, in Somersetshire, before 1723. It was of somewhat reduced dimensions,—1 ft. 9 in. long, 2 in. thick, 3½ in. broad,—and weighed 50 lb.

There are two pigs of lead which appear to have some characteristics in common with the imperial pigs, although they bear private names. One, which was exhumed at Matlock, Derbyshire, in 1783, bears the inscription: "*L. ARYCONI. VERECYNDI. METAL. LVTVD.*" in letters which Hübnér considers similar to those found on the pigs of Hadrian. It weighs 83 lb., and its dimensions are about 20½ × 4½ in. base; 17½ × 3½ in. top. The final word has been pointed out by Lysons as a contraction for *lutudarum*, which has already been noticed. It may equally well represent the British word for which modern Welsh gives the equivalent *llud*. The other, the last of the series which we shall have occasion to mention, was found, in 1848, in Hexgrave Park, near Mansfield, Nottinghamshire, in or near an ancient encampment. The inscription is:—"C. IVL. PROT. BRIT. LVT. EX. ARG." The weight is 184 lb.; dimensions of inscribed surface, 19½ by 3½ in. Caius Julius Protus was probably a farmer of the lead-mines under one of the later emperors, or perhaps a private mine-owner. Mr. Roach Smith and others explain LVT. here as *lutum* or *lutum*, i.e., washed or purified metal, an explanation which rests in a great measure on the use of the word *elutia*, applied to tin found in the gold-mines of Spain and Portugal, and designating that it was washed from the vein by water. But lead could not be exaggerated by any water process, and hence this explanation seems to be untenable. It is more reasonable to explain the inscription as "*Britannicum lutum ex argento*," British *lut*, or lead, derived from silver ore, separated from its silver. The description of the quality of the material would be more important for the metal to bear than the record of an unimportant locality of origin, covered for all intents and purposes by the term "*BRIT.*" The phrase "*LVT. EX. ARG.*" would convey a specific information very necessary in those days to enable the workman to distinguish the mass before him from *stannum*, tin, pewter,

alloys of silver and lead, and other metals, and equally so whenever they passed from merchant to merchant, or from hand to hand.

The use of the word for silver on several of these masses implies that the word for lead should also occur, but on no single example has the term *plumbum* been found. *Plumbum*, like its congener *μολυβδος*, and the English *plomb*, seems to point to the characteristic of mass or round form: while *lut* (Latinised as *lutum*) points to that of density and weight. It is not, we believe, on record that any scientific assay has been made of these pigs of lead, which are declared by their respective inscriptions to be *ex argento*. Such an examination might be conducted without injury to the pigs themselves, and a table of the exact temperatures at which the metal fuses would throw considerable light on the method of their production. The signification, too, of the word "pig," as applied to lead, is obscure; whether it, and the corresponding French *saumon*, a salmon, are derived from the sense signifying a pig and a salmon, is open to some doubt. Certainly a pig has little form in common with a leaden pig. In one of the original manuscripts prepared for the Domesday Survey the term "*plumbum del Pec*" occurs, which may indicate lead of the Peak, in Derbyshire; hence a *peak*, corrupted into a *pig*, may have been used much in the same way as we speak of a calico or a worsted. Phillips accounts for the finding of these leaden pigs by imagining that the Brigantian lead was thrown down from the tired horse by the side of the ancient mining road on Matlock Moor or any other track, and from the discoveries he sees proof of the existence of very ancient mine roads of earlier than Roman date, leading towards Brigantian towns or centres of trade, on which the Romans were not slow, for obvious political and commercial reasons, to fix their attention. Thus they needed not to paralysed a flourishing national industry, but, setting a few cohorts to control a defenceless population, regularly received a share of the native produce. He sees, too, in these ancient roads, in the peculiar rights and privileges of mining districts, in the furnaces, the restricted output, and the foreign trade, a people of remote antiquity "who came from the metalliferous East to the metalliferous West," and he places them and their Semitic processes far higher up the scale of civilisation than in the place usually assigned to them.

#### THE ARCHITECTURAL ASSOCIATION EXCURSION.

A COLD wind and frequent showers were the accompaniments to the first day's excursion of the Architectural Association this year. The programme, however, is an attractive one, including, as it does, South Wingfield, Hardwicke Hall, Bolsover Castle, Haddon Hall, and Wollaton Hall, besides many places of less fame; the country, too, is charming, presenting now woods and wolds, now rivers and rocks; but cold winds and frequent showers go far to reduce what should be a continuous pleasure to a mere trial of patience.

The first day, Monday, covered the country to the south-west of the town of Derby, the first place visited being Longford. It was the church that was to be seen, or rather the monuments within it, although the chancel has some good Decorated windows, and the broad tower is a handsome and solid piece of work. The monuments consist of various effigies of the Longfords, all lying supine, as they have lain for some four centuries. They are in Medieval armour, stiff and stern; one has relaxed a little under the genial influence of the Renaissance, but his condescension is fully counterbalanced by the extra primness of his wife, who lies in sorry state in a corner of the chancel. A vested priest with a comical restored face completes the number. At Somershall Herbert is a picturesque manor-house of half-timber. It is not all native to the spot, for the upper part was brought from a house of the Montgomeries, at Cubley, hard by, when the last of the male line died early in the sixteenth century. So runs the ancient tradition, and an inspection of the roof timbers shows that they were at one time disposed in a different fashion. The aforesaid last of the Montgomeries left three daughters, one of whom married a son of Sir Henry Vernon, of Haddon, and endowed him not only with Cubley, but also with Sudbury, which was the next place visited, and where there is a fine mansion,



somewhat vaguely described in the guide books as being of the seventeenth century. There is some justification for this uncertainty, for there are two claimants to the honour of being builder of the house, and their deaths took place eighty years apart. The older claimant is Mary, widow of John, grandson of the Vernon who married the Montgomery. On her tomb is an epitaph setting forth her trials, her virtues, and the care with which she retrieved the broken fortunes of the house. Among her distinctions is the fact that "she built a manor-house at Sudbury." She died in 1622. Moreover, early in the seventeenth century arose one John Harestaffe, a faithful agent to the Vernons, who indited a rhymed chronicle entitled "John Harestaffe's Poetry whilst he lived at Sudbury, 1635, of the Vernon Family and Concerns." Speaking of this Mary Vernon, he says,

"And where noe Manor house was on y<sup>e</sup> ground,  
She built one newe w<sup>th</sup> cost her many a pounde."

She may, therefore, be considered to have established a strong claim. But then comes a portrait by Sir Peter Pely, bearing the inscription "George Vernon, Esq., who built this house." He died in 1702. He also may be held to have weighty evidence on his side. The probable explanation is that both claims are just. For the house is undoubtedly Jacobean on plan and in the treatment of the mullioned windows. On the other hand, the crowning cornice and the cupola which rises from the roof are of the full-grown Renaissance favoured by Inigo Jones and his successors; whilst all the interior wood-work and plaster-work is of the time of Grinling Gibbons. The most plausible supposition is that "George Vernon, Esq.," remodelled the house, adding the cornice to the old walls, and completely redecorating the interior, — so much as to acquire the right to regard himself as the builder. However this may be, the effect is very good. The fine mullioned windows, and the diaper brickwork crowned with the later boldly-projecting cornice, present a really noble effect, and the interior is kept up with a care befitting the lovely appearance of the whole. Leading from the gardens to the churchyard is a small gateway, bearing the inscription:

OMNE BONUM  
DEI DONUM.

and the initials and date, "E. M. V., Anno 1626," with the Vernon arms. The church itself has been thoroughly restored, and the blessings of Time ruthlessly thrown away by re-tooling the old stonework. The tomb to "John Vernon, esquier," erected by "Mary his wyffe," is against the north wall of the Vernon Chapel; and immediately below it, and forming part of the composition, is the tomb of Mary herself, who built the house, and who, "having lived virtuous matrone 22 years, in her later widowhood maintaininge good hospitalitie to the daily reliefe of y<sup>e</sup> poore," died in 1622. There is not much more to interest except the new stalls and reredos by Mr. Bodley. In driving to Etwell, a fine old half-timber house was passed at Hilton, while at Etwell itself the late seventeenth century almshouses divided attention with the brasses in the church. They all commemorate the family of Porte, the first of whom was a Justice of the King's Bench in the early part of the sixteenth century. His effigy lies, with a wife on each side, curiously sunk in the top of an altar-tomb on the north side of the chancel. One of the brasses is in memory of Henry Porte, who died in 1512, and the other commemorates John Porte, son of the Chief Justice, and builder of the almshouses, who died in 1557. It also records his two wives "Elsebeth and Dorothea," both of whom are portrayed on the brass, the former being supported by her five children, while the latter is represented alone. The almshouses founded by this John Porte were, after the lapse of more than a century, rebuilt in their present form.

On Tuesday the first place visited was South Winfield or Wingfield Manor, where are the remains of a very large house, built by Ralph, Lord Cromwell, in the reign of Henry VI., and standing on a picturesque eminence. The place consisted of two large courts, the southernmost of which was surrounded by the servants' office and a large barn, while the other led to the family apartments. Much of the old work still remains, but sadly mutilated, for in 1744 a great deal of what was left after the turmoil of the Civil War was pulled down to help build another house, and what was not pulled down was left to go to ruin. Enough, however, remains to render the task of identifying the uses of the various apartments a most interesting occupation, if time and weather do but permit.

The detail is far from refined, being of that large and loose kind of Perpendicular which almost justifies the passion of our fathers (and of many archeological clergymen of today) for Early English. There are several features still left, the most noteworthy of which is the bay window of the banqueting-room. But by far the best work is to be found in the crypt under this room, which is vaulted with massive ribs forming four-centred arches, and having very large traceried bosses at their intersections. The double row of vaulting produces a large and noble effect, and would be well worthy careful measurement. From Wingfield the party went to Hardwicke Hall, and thence to Bolsover, at which places the subjoined papers were read by Mr. J. A. Gotch:—

#### Hardwicke Hall.

The houses of Hardwicke and Bolsover ought to be visited in quick succession, in order to compare the work at the two places, separated only by some four miles in distance, and by a very few years in date of erection. They both owe their origin, as we see them, to the same person — Elizabeth, Countess of Shrewsbury, irreverently called "Bess of Hardwicke." This lady was a remarkable person, perhaps more pleasing when seen through the opera-glass of history than she would be if interviewed face to face. She was hard, cold, selfish, grasping, clever, and, above all, managing. She was much admired by Queen Elizabeth. She buried four husbands in succession, and she directed the building of several large mansions, among them Hardwicke, Bolsover, and Chatsworth. If these exploits do not establish a claim to admiration, let ambition perish!

There are two houses here at Hardwicke, and it is not a little difficult to determine at first sight which is the older. That now in ruins is always called the "Old Hall" and it was in this house that Bess is said to have been born in 1520, but how much of that structure saw the year 1520 you may determine for yourselves. It is a matter for surprise why the "New Hall" should have been built at all, when just in front of it there was so fine and so new a house; but according to all accounts, in the year 1576 the "New Hall" was begun. It was designed with the strictest symmetry, and on a large scale; but on looking over it you will probably agree with Horace Walpole's strictures when, in connexion with Hardwicke, he says of the Elizabethan builders that "space and vastness seems to have made up their whole idea of grandeur." Indeed, the detail here is tame and monotonous, the portico is dull and ineffective, and the walls are obviously too much riddled with windows.

"Hardwicke Hall,  
More glass than wall."

is a piece of local rhyme both true and uncomplimentary. In the parapet of the towers may be seen the initials of the countess, "E. S.," for Elizabeth of Shrewsbury, surmounted by a coronet. The remainder of the balustrade is thin and meagre; so, too, is the detail of the walls of the Court, and that of the garden-houses and entrance-lodge. Inside, the same criticism applies. Everything is on a large scale, but the work is poor, whether it is the chimney-pieces, or the great plaster frieze of the Presence-Chamber, or the immense staircases, which seem to have neither beginning nor ending. Nevertheless, Hardwicke is an interesting place. It retains so much of its original air. You see here so plainly into the mind of the sixteenth century, with its love of splendour, its devotion to pedantry, and its erratic notions of art. To the architect it ought to be in many respects a warning, for here undoubtedly is to be found much justification for the strictures so freely lavished upon Elizabethan architecture by the writers of forty years ago. But to the ordinary human being, with a healthy interest in the past, the place is full of delight. The tapestry is unrivalled in its extent and the range of time which its work represents. The walls are covered with portraits of the men and women of old whose names are household words. The furniture, the cabinets, and the articles of vertu form a museum in themselves. Nor are historical recollections wanting. Here lived in captivity for some time the ill-fated Mary Queen of Scots. The husband of the builder of the house was her custodian for sixteen years, and at last saw the fatal blow struck at Fotheringhay. There is still shown some of the work with which Mary caused the time to fleet as carelessly as her hard fate permitted, and one room is always pointed out as that in which she usually lived; but there is

much uncertainty about the real facts of her sojourn, and it is to be remembered that this room of hers is dated 1599, while she ceased to exist in 1587. But a still more hapless figure is associated with Hardwicke. Mary Queen of Scots may conceivably have met with no more than her deserts, but Arabella Stuart's only crime was being born too near a throne. Here she passed her early years in company with the grim old Countess, her "good lady grandmother," and here is preserved a portrait of her when only two years old, with a doll in her hand. On the very day that Mary was beheaded, the child was sending her grandmother "the ends of my hair, which were cut on the sixth day of the moon, and with them a pot of jelly which my servant made." Her end was even more tragic than Mary's. Mary had played for high stakes and lost: she passed in a moment from life to death. But Arabella Stuart did nothing more than desire to live quietly and marry the man of her choice. Political exigencies, however, could not allow free-will to one born in the purple, and so poor Arabella was cast into the tower, where she died — mad.

#### Bolsover Castle.

Here, too (said Mr. Gotch), we see, so we are told, the work of Bess of Hardwicke. The tradition goes that a gipsy had said that so long as she could keep on building she should not die. That may possibly afford a clue to the building of Hardwicke while the adjacent house was still new. It is, at any rate, popularly assigned as the reason for her undertaking so many fine houses. At length, so the story goes, in the year 1607 came a six weeks' frost (they did not know in those days that sugar mixed in mortar makes it set even better in frosty weather), so building operations ceased, and the Countess died. When we say that the Countess built Bolsover Castle, we must add certain qualifying statements. It is only the square building that she was engaged on, for the long and more magnificent building on the terrace is dated 1629 and 1630, and the riding-school is later still. Even the square building was not done by the Countess with a free hand, for it occupies the foundations of the old Norman keep of the Peverils, which strictly control its extent, while the old bailey wall of the castle has been transformed into an ornamental feature of the gardens. The general outline, therefore, of the castle is not what one would expect from the date of its erection. The Countess may have built the place, but if so she employed a very much better designer here than at Hardwicke. The detail of the work here is particularly worth attention. The chimney-pieces are a succession of marvels: there is not one of them but would render the place worthy of a visit. They were clearly designed for their position, and not imported whole from some other house, for the Cavendish cognisances occur throughout, and the property came under the influence of Bess of Hardwicke through her second husband, Sir William Cavendish. Then the vaulting of the hall and of one or two other rooms is most carefully designed — designed, I venture to say, with as much care as any Gothic vaulting in the country. So, too, are the bosses at the intersection of the ribs, and the corbels from which they spring. It is customary to speak of work of this period as having nothing better than Classic features badly done; but here, I think you will agree, is a style as distinct, as logical, and as worthy of notice as Perpendicular or Decorated. Who was the actual designer is not known, but it was not he of Hardwicke, nor the architect who put up the monstrous pile on the terrace, of which the ornament is open to much adverse criticism. It was a son of Bess of Hardwicke, Sir Charles Cavendish, who began this, and a grandson who carried it on, and caused the riding-school to be built. This grandson was William, afterwards Duke of Newcastle, a great friend of Charles I. His treatise on "Horse-manship" is still regarded as an authority, and the book makes frequent reference to Bolsover. He entertained King Charles here in 1633, on which occasion, among the many amusements offered to the royal guest, was a masque by Ben Jonson, called "Love's Welcome." But the wheel of fate revolved, and the royal guest of Bolsover shared the fate of the royal prisoner of Hardwicke. The duke, his host, died at a ripe old age, and Bolsover eventually went by marriage into the family of the Duke of Portland. Then Welbeck Abbey was injured by fire, and



so, 110 years after this great building was finished (1740), it was dismantled to help repair the Abbey. Among its roofless walls, and in the more comfortable quarters of the habitable building, the ghost of poor Arabella Stuart was long supposed to walk. But since her picture was lent to an exhibition and never returned, she has not been seen, I believe, by mortal man. Whether these facts stand in the relation of cause and effect I cannot say; but the caretaker used to be a firm believer in the ghost, and I anticipate that we shall see nothing of her to-day. Before we disperse, let me say that the whole place is full of things worth seeing. The square building abounds in suggestive bits, as well as in the highly-wrought chimney-pieces. In the bailey wall are several small rooms, each with something to see. In the garden is a quaint fountain dated 1622. Then there is the ruin on the terrace, and the riding-school. Besides these, there is the church up in the village, where some of the Cavendishes lie buried beneath tremendous tombs. One of these records with much splendour, and in a quaint and pedantic epitaph, the memory of Sir Charles Cavendish, who died in 1617, and who was responsible for much of the embellishment of the castle, as well as for the commencement of the large building now in ruins on the terrace.

From Bolsover, departure was made for Chesterfield, where, however, there was no time to inspect the church, with its crooked spire, nor the very fine Renaissance monuments to the Foljambes, who died in 1558 and 1585. Thus ended a day of great interest, including as it did Wingfield, with its puzzles inviting solution at every turn; Hardwicke, with its unrestrained magnificence; and Bolsover, full from cellar to roof of scraps for the sketch-book, and suggestions which, if properly utilised, might help to mould the architecture of the future.

We will continue our account of the excursion next week.

#### THE LEAMINGTON MEETING OF THE ROYAL ARCHAEOLOGICAL INSTITUTE.

THIS week we resume our account of the meeting of the Royal Archaeological Institute at Leamington.\*

On the second day, Wednesday, August 8, in very fine warm weather, the party were obliged to begin work early, as they had a long and fatiguing programme before them. They were timed to leave before ten o'clock by ordinary train on the Great-Western Railway for Banbury, where carriages awaited them to take them to Broughton Castle and Compton Wynyates. But a delay was occasioned by the inadequacy of the supply of vehicles; and, as on these occasions it seems to be regarded as the right thing for everybody to be inconvenienced by such faulty arrangements, another quarter of an hour was lost, besides a quarter of an hour lost at Leamington, and that half-hour was not picked up during the entire day. The party drove through the Market-place and past the historic "Banbury Cross" of nursery fame, or rather its modern successor, to Broughton Castle, the noble seat of Lord Saye and Sele, now occupied, however, by Mr. and Mrs. Fane Gladwin. Here Mr. Albert Hartshorne, F.S.A., acted as the guide and interpreter, explaining the leading features of the castle to the party on the lawn, before entering the house. He said that very little was and is known of the early history of the place, the notice of it in Domesday Book being very scanty; but it belonged, at an early date, to a family who either gave their name to it or took their name from it; for Edward I. gave a charter of free warren to a De Broughton in his day, and Edward II. allowed the manor to be held *in capite* under him by a knight named Mandit, by the sergeantry of "mewing" the king's hawks at certain times of the year. In 1425 it had passed by some means or other to one of the Molines or Moleyns family, and from them by marriage successively to the families of Hungerford and Wykeham, — the same family which gave to the church and the country the great statesman and architect, William Wykeham. In 1451 Margaret, daughter of a William Wykeham, carried the estate by marriage into the family of Fynes or Fiennes, now Lords Saye and Sele, with whom it has remained for over four centuries. The second lord, it may be remembered, was beheaded in London in the uprising under Jack

Cade. The Lord Saye and Sele of King Charles's time, in spite of being Master of the Court of Wards, was not a very loyal nobleman; but, though he sided for a time, at least, with the Parliamentarians, he had sufficient influence to obtain a pardon at the Restoration. From that time to the present the family of Fiennes had not taken any active part in politics, or contributed much to the making of English history. The castle, or at least the first and central part of it, said Mr. Hartshorne, was certainly erected by one of the Broughtons. The walls and fortifications were strong, and the castle was protected by a very large *enceinte* of walls, and a moat so large in area as to keep assailants at a respectful distance; for it was commanded by rather high ground, on one side at least. Buck's view of Broughton, taken in 1729, shows these walls in their full extent, embattled, and with several towers; at present, however, of the exterior defences little remains except the gatehouse, with its drawbridge, now dry, and about 50 ft. or 60 ft. of the old walls on the right as you enter. Mr. Hartshorne explained that a considerable part of the structure, especially towards the eastern end, is of Edwardian date, though very much altered at a later period, the greater portion dating from about A.D. 1544. The great dining-hall, which occupies the greater part of the side facing the visitor as he enters the outer court, was once far grander than it is now, having been enriched with stone-carvings, much of which have been removed, though the walls are still surmounted by the heraldic bearings of Fiennes. According to Skelton's "Oxfordshire," the south front is that which retains the most traces of its original character, but that is the part which is the least visible to the tourist. The hall is fine and lofty, but with a modern ceiling; it is hung with specimens of old armour and there are some fine family pictures both in it and in the dining and drawing-rooms. The party were shown through these, and taken up some very narrow back-stairs and passages to the state rooms and bedrooms, as well as to the gallery, with its fine oriel window, and up to the Council Chamber, in which it is said that many of the Parliamentary Generals held their secret conclaves, and to the Guard-room at the top of the house, — a chamber built above the leads, and almost among the chimney-pots, for the purpose of a look-out. The view from the leads of the castle, though limited by the surrounding woods and the trees of the park, is very fine. From the house the party were led back, through the entrance gateway, to the parish church, which stands, as it does so often in old manors, close to the entrance gate. It is a noble church, consisting of nave, chancel, and southern aisle, of the Edwardian period, when the "Early English" style was passing into the "Decorated," and it contains three very fine tombs to various members of the families who had owned Broughton during the Crusades and subsequently. The figures of the Wykeham family have been somewhat ruthlessly knocked about by the Parliamentary forces; and the outline of all three tombs, one of which has a fine mural canopy, is to be seen figured in Skelton's "Oxfordshire." Owing to the lateness of the hour, the visit of the archaeologists to this most interesting church was much too short and hurried.

The same remark applies to Compton Wynyates, the noble "second seat" of the Marquis of Northampton, and one which, in spite of its giving the surname and second title to his family, and in spite also of its attractions in the long summer days, his lordship seldom inhabits, visiting it only for a few days at a time. It stands low in a green valley, surrounded on all sides by leafy woods and hills. The archaeologists had less than an hour in which to see over the house and to get their luncheon; and it must be owned that they did ample justice to the "cold collation" to which, "by kind permission" of the noble Marquis, they were allowed to sit down in the great hall. This, as a matter of fact, was almost the only room which they could study at their leisure, for a hasty peep into the other apartments was all that was allowed them by Mr. Hartshorne's bugle, which warned them that they must depart if they wished to catch the return train at Banbury. The consequence was that for all business and artistic purposes, Compton Wynyates is at present almost unknown to the archaeologists, no description of it being publicly read, and the quaintly-carved screen, the minstrels' gallery, and the private apartments, with their quaint old furniture and fittings of the Tudor and Stuart period, being left almost

unexplored. A few of the party passed through a room called after King Charles, because that king slept in it on the night before the Battle of Edgehill; but they did not even get a peep into "the haunted chamber," or see the ghost which is supposed to haunt it. Still, the glorious sunshine, and the exquisite contrast of the green Virginia creepers and the velvet lawn with the red chimneys and roofs above them, presented a scene which is not likely to be soon forgotten.

On their road, both in going and returning, the archaeologists were driven past the churches of Tadmorton and Swalecliffe, at both of which they noticed that the sanctus bell turret was still standing on the junction of the roof of the nave with that of the chancel. The programme of the day had included a visit of inspection to Bloxam Church and College, but on account of the lateness of the hour that pleasure had to be foregone. This was a great disappointment to most members of the party, since Bloxam is one of three neighbouring parishes which can boast of as beautiful spires as any three country parishes in the kingdom:—"Bloxam for height, King's Sutton for strength, and Adderbury for grace." As they passed, however, they were much struck by the beauty of the ball-flower ornament on the spire and tower, and by the fine carvings of the "Day of Judgment" which crown the western doorway.

At Adderbury Church the party made a halt for a hasty inspection of the church, and to slake their thirst by a cup of tea in the pleasant garden of Dr. Thorne, adjoining the western tower, a house which most of the party very naturally mistook for the rectory. Adderbury Church is remarkable for its lofty and spacious Perpendicular chancel, which reminded the party of what they had seen on the previous day at Stratford-on-Avon. Precentor Venables said a few hasty words in admiration, rather than in explanation, of the fabric, when the inexorable bugle was sounded and his audience at once retired to their carriages, which were waiting in the street, and conveyed them back to Banbury in time to catch the evening train to Leamington.

At the meeting of the Historical Section in the evening, a very able and elaborate paper was read by Mr. Albert Hartshorne on "The Monuments and Effigies in St. Mary's Church, Warwick, and especially those in the Beauchamp Chapel." In the course of his remarks, he said that the reason why so long a series of great members of the illustrious house of Warwick was commemorated by so few monuments at Warwick is to be sought and found in several circumstances, foremost among which was the removal of the choir in the time of Edward III., the change of their burial-place from Warwick to Tewkesbury Abbey, and the great and destructive fire of 1694. The Beauchamps first figured in St. Mary's Church in right of the marriage of Isabel Mandit with William de Beauchamp, who died in 1269. Mr. Hartshorne then proceeded to describe the effigy of Thomas de Beauchamp, and made some remarks on the disfigurement and deterioration of monuments in old churches through the adoption of alabaster as a material. He next proceeded to show that the monumental effigies in St. Mary's were real attempts to portray the features of the person whom they commemorated. He then entered into considerable details respecting the knight's armour and the costume of his lady, and pointed out the gradual changes which had taken place in armour in the course of centuries, remarking on the leading features of the earlier and later forms. He also dealt with the other surroundings of the tomb, and gave an interesting account of the modes of interment practised in the Middle Ages. He next entered into a full and elaborate description of the effigy of Sir Thomas de Beauchamp, dated in 1406, and also spoke of the effigy and tomb of "Brass" Beauchamp in the choir, at the same time adding some interesting details relating to the cost of the construction of each part of the monument. He next proceeded to describe the effigies of the Elizabethan period, including that of Ambrose Dudley and his brother Dudley, Earl of Leicester, and concluded by describing the tomb of Fulke Greville, "servant to Queen Elizabeth, councillor to King James, and friend of Sir Philip Sidney." Mr. Hartshorne had his paper illustrated by some drawings of these effigies made of the size of life, which were hung upon the walls of the Council Chamber, and his paper was rewarded by a vote of thanks.

The Rev. G. Miller, of Radway, followed with

\* See Builder, p. 98, ante.



a short but valuable historical paper on the Battle of Edge Hill, which he described most graphically. Mr. Miller's paper elicited a strong and general expression of opinion that it formed an important addition to the history of our country, and that it certainly ought to be printed in the Institute's *Journal*, along with a small diagram, showing the relative positions of the two combatant parties.

In the Antiquarian Section, on the same evening, over which the Rev. Father Hirst presided, two papers were read—the one by Mr. W. Andrews on "Cup and Circle Markings on Church Walls in Warwickshire," and the other by Mr. T. W. Whitley, architect, of Coventry, on "Masons' Marks on various Stone Buildings in the Warwickshire District."

Thursday, the 9th inst., was a far less busy day. The annual meeting of members of the Institute was held at 10 a.m., when the report, balance-sheet, and accounts were read and passed, and the various officers of the Society were re-elected. Reporters were not admitted to this meeting, but it transpired that at it was considered the question as to the place of meeting next year, and that Oxford, Cambridge, Edinburgh, and Norwich were suggested, and that the feeling of the meeting was in favour of Norwich, if it could be arranged. It was resolved also to take new steps for the purpose of increasing the number of new members in the place of those who drop out of the list through death.

At the close of the annual meeting Mr. R. Ferguson, Chancellor of Carlisle, opened the Architectural Section with a paper on the subject of Archaeology and Antiquarianism in general, from which he passed to a general review of the work included in the Institute's programme. Though Speed mentioned eight strong castles in Warwickshire, and Mr. G. T. Clark spoke of six, yet two only of these would be visited by the Institute, viz., Warwick and Kenilworth; but they were the two crowns of the Midland district, owing to their ancient strength and their later magnificence, and to their intimate connexion with the history of Warwickshire—and, indeed, of England itself. Warwick was originally fortified by a lady of the royal house of Mercia, to block the great fosse-way between Lincoln in the north-east and Bath in the south-west, along the face of that oolitic range of hills which stretches from the Severn to the Humber. For this purpose she fixed on a small rise of rocky character by the side of the waters of the Avon, and there she laid the first foundations of what grew by degrees into the noble Castle of Warwick. Of this Castle, and also of Kenilworth, so much had been written by Mr. G. T. Clark and others that little need be said at the present moment. Passing next to the archaeology of the last twelfth century, Chancellor Ferguson noticed the architectural controversy which had raged as to the Roman or non-Roman origin of the walls of Chester, and reviewed the proceedings of the meeting of the Institute in that city in 1886, and the visit of the Antiquarian Association to it last year, specially mentioning the recent excavations made there and the large find of inscribed and sculptured stones of Roman date, and quoting the accounts of the walls given by Mr. Shrubsole and Sir James Picton respectively, the real fact being that the truth lay between the two rival parties, the walls of Chester for the most part being Medieval in their exterior face, except in two or three places, but resting on a Roman ground-plan, and embodying many stones that had been used by the Roman legions. The Chancellor also mentioned another architectural event belonging to the past twelfth century, namely, the memorandum on Church Restoration issued by the Society of Antiquaries of London, which strongly censured the unauthorised removal and destruction of monuments, fonts, and other portions of sacred buildings, and insisted on the importance of a rule that no restoration or destruction of any sacred or ancient work should be carried out without a "faculty"; and he quoted the recent words of the Chancellor of the Diocese of London to the effect that "any churchwarden or other person who makes alterations in a church or churchyard, without a faculty first obtained, is liable to be cited into the ecclesiastical courts, and to be censured and condemned in costs." This, he added, could not be too widely known. At present, however, the law was sadly inoperative, for when such destruction is wrought in a church, the Chancellor has no power to set the law in motion himself, but that work must be done by others. Some method or plan, he urged, should be de-

vised for making faculties compulsory in all such cases; and Chancellors should be duly qualified for their task by some knowledge of ecclesiastical architecture as well as of law. In conclusion, he alluded in terms of regret to the deaths of Mr. Beresford Hope, Mr. Bloxam, and Mr. R. P. Pullan.

The reading of this paper was followed by a long discussion as to the duties of Chancellors under the present law, the Rev. Dr. Cox pleading hard for confining each Chancellor to a single diocese, while Mr. E. Walford strongly urged the propriety of limiting the powers of Chancellors themselves in granting faculties, instancing St. Alban's Cathedral, where Lord Grimthorpe had met the remonstrances of learned societies by saying that he had an unlimited faculty, even to pull down the old abbey, if he had so pleased, and to erect a Grecian temple in its place. A vote of thanks to Mr. Ferguson, however, was accorded; and Mr. Alderman Favel, one of the churchwardens of Leamington, took occasion of a break in the proceedings to exhibit to the members of the Institute the church plate belonging to the parish.

The meeting was brought to an end by the reading of a few extracts from Mr. E. Werner's paper on "The Construction of the Great Wall of China." These were read by Mr. J. Hilton, in the author's absence, but they failed to secure much notice from a body of gentlemen and ladies whose attention was wholly concentrated on Warwickshire and its surroundings.

After luncheon had been despatched, the party made their way over to Warwick, some by railway, some by tramcars, and some by carriages. For their visit to Warwick Castle and to St. Mary's Church they had been already prepared, to a great extent, by Mr. Hartshorne's paper read on the previous evening; and to very many of the party this part of the programme was not new. Still, all were glad to pay a visit to the castle and church under the auspices and guidance of Mr. Hartshorne, whose father had acted as *clercione* to the Archaeological Institute on visiting the same scenes nearly a quarter of a century ago.

Their first visit on arriving at Warwick was the "High" Church of St. Mary's, a large and noble structure, the tower of which, seen at a distance, reminds the travelled tourist of those of Magdalen College, Oxford, and of St. Stephen's Church at Bristol, through a close inspection shows that it is of a far more modern date, and that it will not "pass muster" as a Gothic building. A paper on this edifice had been prepared by the Vicar, the Rev. Mr. Irvine; but he was obliged to depute a friend to read it aloud, as he was confined to his bed by a carriage accident. We are able to give this paper in *extenso*.

"This church is interesting in an architectural, but chiefly in a historical, point of view. No record exists of the foundation of this church, but that it was prior to the Conquest appears from the fact of its possessions being entered in Domesday Book. Its rise into importance took place in the reign of Henry I., when Roger de Newburgh, Earl of Warwick, made it collegiate and incorporated with it the Collegiate Church of All Saints, at that time standing within the precincts of the Castle,—this was done in 1123. During the reign of Henry III., the Monarch and his Court were on one occasion present in this church; it was after an attack had been made by Simon de Montfort's party on Warwick Castle, and the Governor carried prisoner to Kenilworth. On this, King Henry, coming to Warwick, held a council of his peers, and besieged Kenilworth Castle. At length terms were agreed upon, and these terms were publicly announced from the pulpit of St. Mary's by the Pope's legate, Ottobon, on the Sunday after the Festival of All Saints', in the presence of the King and the statesmen of the kingdom assembled here. In the succeeding reigns it increased in dignity and importance, having absorbed the churches of St. John, St. Michael, St. Lawrence, St. Peter, and St. James, all within the precincts of the town. Thomas Beauchamp, Earl of Warwick, began to rebuild the choir, 1367, but dying before it was completed, he left directions to his executors to continue it. It remained, therefore, to his successor, Thomas Beauchamp, his second son and heir, to complete the design, which he appears to have done in the noblest manner, for he newly built from the ground the whole body of the church. But the time was approaching when its glory should be decreasing, and when Dean and Chapter should

no longer exist in their collegiate capacity. In the 37th Henry VIII., it was dissolved, and appropriated to the King's Commissioners. A few months later, by letters patent, the fabric, shorn and clipped, was conveyed to the inhabitants of Warwick. During the year 1571 two imposing ceremonies were performed in this church, the celebration of the Order of St. Michael by Robert Dudley, Earl of Leicester, and the state funeral of William Parr, Earl of Northampton, and brother to Queen Catherine, who died at the Priory, in that year. On September 5, 1694, Warwick was visited by a destructive fire, which burnt a great portion of the town, as well as the tower, nave, and transept of St. Mary's. Subscriptions were immediately set on foot, and Commissioners were appointed by the Crown to superintend and direct the rebuilding of the church. At one time there was an idea of placing the work in the hands of Sir Christopher Wren. This was, for some reason, abandoned, and Sir William Wilson was selected to erect the new structure, and to him must be attributed the incongruity of the present building. He also rebuilt Four Oaks Hall and Nottingham Castle. In describing the church of St. Mary's, the first part to which I shall direct your attention is the tower. It consists of three stages in height, in the lowest of which four very massive piers support arches of a pointed form. Above each of these arches is a pointed arch of blank panel work, divided by a shaft of clustered reeds, with a capital formed of the acanthus leaf. In this are two small perforated lights, and on each side two semicircular niches of semi-Classic design, with projecting brackets at the base. This stage is divided by a cornice supporting a balustrade, and adjoins the roof of the church. Immediately above this balustrade, on the north, west, and south sides are tablets, recording the erection and rebuilding of the church. The second stage is similar to that below, with pointed arched panel-work and semicircular niches; the division between it and the stage above is worked by a horizontal cornice moulding. The third stage of the tower consists on each side four pointed single-light windows, two immediately above the other two; these have on each side two niches at the top. There is a cornice above, and a blocking-course, on the face of which are shields (twelve in number), with the armorial bearings of the families that have held the earldom of Warwick. The whole is crowned by a parapet with large square crocketed pinnacles at each angle, and a smaller pinnacle rising from the middle of the parapet. The composition is partly Classic, partly Gothic. Though the tower is faulty in detail, it is very striking in appearance, and a conspicuous land mark. As stated in the inscription, the old tower, with the nave and transepts, was burnt down in 1691. The new tower was twice rebuilt: the first tower, which was deemed unsafe, was 98 feet high, the second, and present tower, is 166 feet high. The windows are eight in number, piercing the north and south walls of the aisles and transepts. They are said to be miserably designed. Each has six semicircular headed lights. The head of each window is filled by a huge light of a horse-collar form. In the spaces between the windows there are buttresses of meagre design. A horizontal cornice runs along the top above the windows, and an open balustrade parapet, with stone urns at intervals. The gable front of each transept is surmounted by an urn, the symbols of Paganism taking the place of the Christian emblem—the cross. Entering the church, we see that the nave is divided from the aisles and transepts by four arches, pointed in form, and supported by piers. The roof is arched and coiled, and each bay is divided into eight compartments by small plaster ribs, and at the intersection of the ribs is an escutcheon, surrounded by scroll work. The present pewing was erected in 1795, when the side galleries, which were before limited to the length of the aisles, were extended across the transepts, and the organ, then standing between the nave and the choir, was removed to its present position. The organ was built by Swarbrick in 1717; in 1834 it was enlarged by Bishop, and again in 1842 by Bamfield. It has 46 stops and 2,356 pipes. The transepts are shallow in proportion, and consist of only one bay of vaulting in addition to the bay of the breadth of the aisles. In the old nave there were many interesting monuments of the deans and secular canons of this church, and the burghesses of the town, which were completely destroyed by the fire which consumed the nave. Two brasses only were saved



—one on the monument of Thomas Beauchamp, by whom this church was rebuilt. It stood at the upper end of the south aisle in the old church, and was an altar tomb, surrounded by a canopy. On the monument were brass figures of the Earl and Countess, and these have been inserted in a marble slab and affixed to the east end of the south transept, near the Beauchamp chapel. The other brass is that of Thomas Oken and his wife, formerly a mercer and a great benefactor to the town. This is now affixed to the east wall of the north transept. It appears that there was one chantry attached to the church, which had an altar dedicated to St. Anne. It was founded by Robert Walden 2nd Henry IV. The chantry is supposed to have been the present lobby—may it not rather have been in the vestry? The oldest part of the church, that which remains of the time of Roger de Newbury, is the crypt under the choir. It is divided into two parts by four piers, each part containing five bays of vaulting. The three westernmost piers, with the three bays of vaulting, exhibit Norman architecture, in the early part of the 12th century. The fourth and easternmost pier is a plain but massive octagonal pier, in the Decorated style of the 14th century, with a moulded capital. This and the two easternmost bays of vaulting are the work of Thomas Beauchamp, who died 1369. The crypt appears to have been lighted by five windows, of which only one in the easternmost bay remains perfect; the others have been partially filled up. That portion of the crypt lying below the vestry is now a burial vault for the Earls of Warwick, converted to that purpose about 1770. An object of curiosity is an ancient "cucking" or ducking-stool, which reminds us of the forcible though expressive mode of punishment used by our ancestors towards meretricious females. The choir is said to have been finished by the second Thomas Beauchamp, A.D. 1392; but Mr. Bloxam thinks from the depressed four-centred arch of the large east window, and the panel-work with which the east wall of the choir is covered, that alterations must have been made by Richard Beauchamp, Earl of Warwick, who founded the Chapel of Our Lady. The monument in the centre of the choir is that of Thomas Beauchamp, the second of that family. He was distinguished in Edward III.'s reign at the battles of Crecy and Poitiers; at the siege of Calais was Marshal of England, and one of the founders of the Order of the Garter. He died of the plague at Calais in the 43rd year of Edward III., 1369, and was buried in the middle of the choir. He married Katherine, daughter of Roger Mortimer, first Earl of March, who died not many weeks before him. Thomas (his second son), who succeeded him, was distinguished in the French wars. He, with other nobles, sided against Richard II., was arrested and imprisoned in the Isle of Man, but was afterwards restored to his liberty and lands. He finished the choir begun by his father, and newly built from the ground the whole body of the church. He was buried, as before mentioned, in the south aisle, with Margaret, his wife. He died in 1401. Dugdale mentions that Thomas Beauchamp, whose monument is in the centre of the choir, had nine daughters, whose portraits are curiously drawn and set up in the windows on the south side of the choir of the Collegiate Church, and in the habit of that time. It is needless to say that these disappeared during the Civil War, when Colonel Purefoy made himself remarkably conspicuous by his zeal in purging the churches of the neighbourhood. The present east window was erected in memory of Mr. Boudier, who was connected with this church as curate and vicar for sixty-three years, and also in memory of Mr. Kemp, a Burgess of Warwick. The reredos was erected in 1836, to the memory of Mr. Margetts, a native of Warwick. The monument which occupies the Chapter House is that of Sir Fulke Greville, the founder of the present line (1628). Other monuments to be noticed in the lobby are those of Sir Thomas Puckering, owner at one time of the Priory, and son of John Puckering, Keeper of the Priory Seal in Queen Elizabeth's reign; and that of Francis Parker, tutor to Lords Robert and Fulke Brooke (1693). We now pass on to the Lady Chapel, commonly called the Beauchamp Chapel, from the founder. It is one of the richest of the structures erected as mortuary chapels during the fifteenth century. It has suffered much from desecration. On June 14, 1642, a band, under Colonel Purefoy, entered the chapel, and defaced its monuments. The altar, with its decorations, was,

it is supposed, then broken down. The present altar-piece, representing the Annunciation of the Blessed Virgin, was the work of Collins, a stonemason in Warwick, and erected in 1735. This chapel was founded by Richard Beauchamp, Earl of Warwick. He lived in the reigns of Richard II., Henry IV., V., and VI. He made a pilgrimage to the Holy Land, was appointed High Steward of England, was active against the Lollards, negotiated the marriage of Henry V. with Catherine of France, and was made one of the guardians of Henry VI. On the death of the Duke of Bedford he was appointed Lieutenant-General of France. He died at Rouen, April 30, 1439, leaving instructions in his will for the building of this chapel. These were faithfully carried out. The chapel took twenty-one years in building, being finished in 3 Edward IV., 1464. On the south side is a small wooden piscina, a very rare and curious example of that material. A flight of well-worn steps leads to some perforated wooden panel work, and to a small aperture through which the elevation of the Host at High Mass might be seen. This little chapel may have been constructed for the performance of Low Mass by a single priest in commemoration of the founder of the chapel. The four-barred helmets were originally part of the funeral achievements fastened over the monuments in this chapel; one of these is supposed to have belonged to the Earl of Northampton, who lies buried in the choir of the church.

Precentor Venables, in moving a vote of thanks to the reader of the paper, expressed the great regret felt by all the members of the Institute at the sad accident which had deprived them of the presence of Mr. Irvine, and he pointed out some of the many features of interest in the church, and also in the Beauchamp Chapel, especially the beautiful and costly monument, and their fine carvings and decorations. A visit was also paid to the crypt beneath the chapel; and the bugle then warned the visitors that it was time to quit on a visit to the local Antiquarian Museum, containing some of the finest miscellaneous collections of curious objects to be seen in this country out of the metropolis. Here was shown an Etruscan vase, about 14 in. in height, which had been lately found in the course of excavations near the Suez Canal. It was carefully opened in the presence of the members, but it was found to contain nothing except a few small pieces of bone, whether of a man, or of some other animal, was uncertain. Leicester's Hospital, that well-known Elizabethan structure, so often pictured and photographed, was next inspected, the Rev. Mr. Hill, the Chaplain, briefly explaining it. The charity was founded by Robert Dudley, the famous Earl of Leicester, for decayed soldiers born in some few Warwickshire and Gloucestershire towns and villages, and is still keeping up the charitable intentions of the founder. He also drew attention to an inscription in the Great Hall, which stated that "King James I. was right nobly entertained here by the Honourable Mr. Fulke Greville, Chancellor of the Exchequer, and one of his Majesty's most honourable Privy Council, upon the 4th day of September, A.D. 1617. God save the King." Here a few remarks were made by Precentor Venables, and by Mr. E. Walford, who drew the attention of those present to the great likeness between this hospital and that founded by the Delapoles at Ewelme, near Oxford, and suggested that they were copied largely the one from the other.

From the Museum, a walk of only a few hundred yards brought the visitors to the gate of the proud Castle of Warwick. This is so well known to tourists and travellers that it is not necessary to describe it here at any length. Lord and Lady Warwick were in London, busily engaged in the wedding of one of their sons; but they were represented by his lordship's agent, Major Fosbery, who received them at the Castle gates, and conducted them over the entire edifice, dividing them into three separate parties, and showing to them the contents of the noble armoury, which is scattered up and down the Castle, including Oliver Cromwell's helmet, and the suit of armour worn by Lord Brooke when he was killed by a shot at the siege of Lichfield. While the members were preparing to go over the Castle, Mr. Hartshorne delivered a short address, recapitulating the early history of it, so far as it is known or ascertainable, ascribing the formation of the original mound to Ethelreda, wife of the King of Mercia, about A.D. 915-920. Later, he said, this mound was crowned by a shell keep of stone, probably erected about the end of the thirteenth century

by the then Earl of Warwick. It was, however, destroyed in A.D. 1263, soon after which the walls were rebuilt by Thomas de Beauchamp, who also fortified the gate entrance, and built the great range of vaulted sub-structures under the Castle, and also the Tower called after Cesar. He drew attention to the massive character of this work, and to the way in which it had been, as it were, woven into the native rock, so that it seemed to be almost hewn out of it. On the right hand he pointed out Guy's Tower, which he said was completed in about A.D. 1394, along with other subordinate fortifications. Mr. Hartshorne then continued: "When the Institute came here in 1864, my father, who described the Castle, spoke of a rude inscription which he had discovered on the top of Cesar's Tower. He deciphered it 'R.E.XXX—III,' and thought it might be intended for 'the 30th year of Edward III.' (1357); he laid no special stress upon it, but gave it for what it was worth to the Institute, having himself some faith in it. I have that same faith, but I cannot find the inscription—at least, only a part of it; the rest has vanished in some necessary repairs. A chapel was founded in the Castle by a licence in 1337. You will observe, in passing, the great interest of the gate-house and its system of defence. The greater part of which is now the Castle proper was the work of Greville, to whom the place was granted by James I. He spent large sums here, and later alterations and improvements have made it one of the most charming and princely places in England."

Entering into the house, the visitors passed through the hall and armoury into the chapel, and the sub-structures or vaults, now used for keeping stores, and for the purposes of the kitchen; these, it was remarked, could scarcely fail to remind them of the undercroft of the Bishop's palace at Wells, and the sub-structure at Brancepeth Castle. Lord Boyne's seat near Durham, which they had visited within the last few years. Passing out at the eastern end of these vaults, the party climbed the mound, and descended on the other side to the gardens of the Castle, where they were allowed to inspect the so-called Warwick Vase, which stands in a large conservatory, built by the grandfather of the present Earl of Warwick for its reception.

Here Professor Clark read the following paper on the vase:—"I can add but little to the accounts given by the official guide and the various guide-books. Some few particulars, however, I have gathered from other sources as to its history, its probable author, and its possible original destination. The guide-books tell us that it was purchased by a late Earl of Warwick from Sir William Hamilton towards the close of the last century. I suppose this was the second Earl Brooke and Warwick, who, according to West, writes thus of the work of art and its present locality:—"I built a noble greenhouse and filled it with beautiful plants. I placed in it a vase, considered the finest 'remain' of Grecian art for its size and beauty." The inscription on the pedestal tells us that the vase was dug out of the ruins of Hadrian's 'lordly pleasure-house' at Tivoli; that it was repaired at the charge of Sir William Hamilton, then our ambassador to the King of Sicily; sent home by him, was dedicated by him to the 'ancestral, or national, genius of liberal arts,' in 1774. The inscription in question is not, as sometimes at Rome, a defacement of old work, the pedestal and part of the foot of the vase being modern. The repairs you can see. They are evidently the faithful replacement of the original in all cases but one—to be mentioned presently—as to which there is some question. What Sir William Hamilton meant by 'the ancestral, or national, genius of liberal arts,' I do not exactly know. Sir William was a man of elegant taste in more directions than one. We owe to him the collection and preservation of many beautiful works of ancient art, the majority of which were purchased by Parliament for the British Museum after his death in 1803. It was splendidly engraved in his 'Vase e Can; delabra,' by Piranesi, from whose brief notes to the engravings I learn the further particulars that it was found in the year 1770, during excavations carried on in the bed of a small lake called Pantanello, which was anciently included in the *emblem* of Hadrian's Villa. Of course this is not the time to describe that wonderful town of halls and terraces which Hadrian built or finished on his return from his last progress round the world. I cannot trace this Lake Pantanello on the modern plans. Near the entrance are the remains of what's



generally considered to be a Greek lake overlooking the so-called valley of Renpe, and the stream at the bottom of that valley. The 'lake' may have been there. How the vase came into it we do not know. The villa is said to have been occupied by the Gothic King, Totila, 544 A.D., in his siege of Rome. This precious monument of art may have been hung in, to save it, on the invader's approach, like the wonderful mass of curiosities in the well of Coventina, near Hadrian's Roman wall from Newcastle to Carlisle. Hadrian's Villa was finished between 135 and 138 A.D., but the works of art brought to it from all parts of the world might have various and much earlier dates. This work is—I know not on what authority—generally attributed to Lysippus, celebrated for his portraits of Alexander—a Greek artist of what is called the third period, about the close of the fourth century before Christ—in which the beautiful or elegant style began to replace the noble severity of Phidias and his school. The subject speaks for itself. The lower rim, so to speak, is covered by two tiger or panther skins, of which the heads and the fore paws decorate the sides of the vase, while the hind legs are interlocked and hang down between the handles of the vase. These last are formed of pairs of vine trunks, the smaller branches and grapes of which twine round the tip of the vase. Heads, each with a thyrsus or a club belonging to the owner of the head, are arranged along the tiger-skins. With one exception, these heads are generally, and, I think, correctly, regarded as silent, or male attendants of Bacchus, the god of wine. The exception is of a very beautiful female face. This has been held by some *avantis* to be modern, and it has been suggested that it is, in fact, a portrait of Lady Hamilton; but I shall leave the question to interest your curiosity or thirst for knowledge as soon as I have done. There is a crack round the greater part of the head; the face is somewhat modern. The restorations of the eighteenth century were by no means free from insertions of this kind. On the other hand, the hair is, I think, continuous with the main substance on the vase. The face is attributed, you must remember, to a period of beauty and softness, rather than of Phidian dignity, and it does not appear to me to be exactly that of Lady Hamilton. That she loved to be represented as a Bacchant we know—whether she would have acquiesced in the pointed Faun's ear, which this figure bears, as cheerfully as Hawthorn's Donatello, I am not so sure. Piranesi gives the female head in his engraving, and says nothing of any change. Assuming this to be an original Bacchant or Faun, the somewhat masculine surroundings of the lady are not out of keeping with an account of the strange and rather mixed pinnies in which the votaries of Bacchus indulged. Classical scholars will remember in that weird play, 'The Bacchæ,' how the mother of Pentheus vaults her prowess, and success in their wild hunting revel over the hills of Boeotia. Apropos of hunting, I may say a word on the club. This object is, I think, pastoral. The thyrsi bear the usual fir-cone, or the bunch of vine or ivy leaves, with the pyramid of grapes on the spear point, inciting to madness, which peeps through. The tigers or panthers, the vine trunks, tendrils, and grapes, the thyrsi, and the beautiful Bacchant, amidst the Silent, all belong to the same god. This is a Bacchic representation, a subject which will suit very well with the time of Lysippus, as the beauty of this work suits the traditional characteristics of his school. Several suggestions have been made as to the original destination of this vase. The most favoured one appears to be that it was 'a vessel in which to mix wine with water, and was intended for the centre of such apartments as were devoted to festive entertainments,' or 'was probably dedicated in some temple of Bacchus.' With regard to this wine-mixing story, I may remind you that the vessel holds 163 gallons. It may have had that quantity of liquor put in it in Hadrian's time. Even in our degenerate days we read of conduits and fountains running wine. But I think you will agree that the original destination of this vase could scarcely have contemplated this as an ordinary proceeding. Moreover, I believe I am correct in saying that no aperture has been found in the bowl, which is, perhaps, a little against its having been used for holding any liquid. A fountain might have been intended to play in it, of which the water was to run over the edge; but even here we should expect a pipe to introduce the supply. I should

question whether this particular specimen, and others like it, were ever meant for anything but purely decorative purposes. But as most decorative objects have had their origin in a use of some kind, I am inclined, in this case of very large vases, to suggest the bath as furnishing their first idea. The Greek bath was not on so vast a scale as those stupendous labyrinths of building which we see at Rome,—club-house, public-house, people's palace, all in one. The great hot-air chamber and cold swimming-bath were by no means the invariable and conspicuous features which they became in the days of Diocletian and Caracalla. What we do see in the Greek painted representations of bathing is sometimes a basin or tub, wherein the bathers could stand or sit; but more often, a round or oval vase, resting on a pedestal, round which they stood to wash themselves. That is the vessel which I imagine to have been enlarged into the great ornamental vases, such as the one before you. Athens, it is true, writing under the Roman Empire, speaks of the vase in use as holding sometimes as much as 50 gallons. This vase is much larger, and, if for use, would, I think, have been of metal. Of course, this is far too clear and sharp workmanship to be a copy from metal, though metal copies have been made of it. I take the object, then, of this work of art to have been, from the first, purely decorative. From the Bacchic emblems which it bears, I think its original locale to have been, very probably, a temple of Bacchus, as was suggested by Piranesi; nor is it impossible that Hadrian may have placed it in some corresponding position within his town-like palace under Tivoli.

A vote of thanks to Professor Clarke having been passed, the entire party repaired to the "Shakespeare" Room, where Lord Warwick had given orders that they should be hospitably entertained at tea, a boon which was all the more gratefully appreciated on account of the heat of the afternoon.

Among the party who took part in the proceedings of the two first days of the meeting were Lord Leigh, Lord Percy, the Mayors of Birmingham, Stratford, Coventry, Leamington, and Warwick, the Hon. and Rev. Canon Leigh, Sir A. Hodgson, Mr. Dugdale, Precentor Venables, the Hon. and Rev. W. Verney, Major Fosbery, Miss Percy, the Rev. Dr. Holden, Miss Seton, Mr. Talbot Bevan, Miss Bury, Mr. and Mrs. Hilton, Mr. Shirley, the Rev. Sir Talbot Baker, Mr. H. W. Freeland, Mr. Longden, Mr. Justice Pinhey, Mr. Baylis, Q.C., the Rev. D. Cox, &c.

We will continue our report of the proceedings of the meeting next week.

### Illustrations.

#### CHURCH OF ST. ANNE, ROATH, CARDIFF.

WE now give an interior view of this church; an exterior view, accompanied by a plan and description, was published in the *Builder* for November 5, 1887. The architect is Mr. J. Arthur Reeve.

#### DRAWINGS OF ST. GEORGE'S CHURCH, BLOOMSBURY.

THE measured drawings of St. George's Church, Bloomsbury, which we publish this week, are by Mr. P. N. Gihman, and gained the award of the Royal Academy Silver Medal in 1887.

St. George's Church was designed, in the early half of the eighteenth century, by Hawksmoor, the designer also of the Church of St. Mary Woolnoth, and, whatever may be thought in the present day of Hawksmoor's taste as to detail, there is no question that in these two churches he showed himself an architect of real originality in design.

It is not generally known,—at all events, to this generation,—that the peculiar steeple of St. George's was intended by its author as a realisation of the design of the monument of Mausolus. More recent criticism and investigation of Greek architecture puts Hawksmoor's conception out of court as a representation of the mausoleum; but the fact that it was so intended is not without its interest.

#### ROOM FROM KING'S LYNN, NORFOLK.

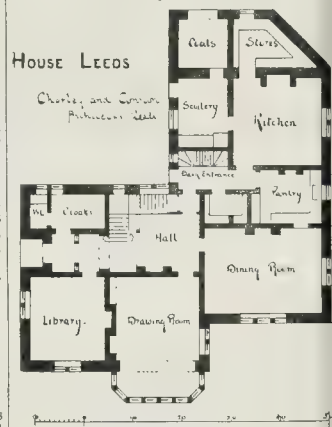
THE panelling and fireplace here illustrated have been removed from an old house in Queen-street, King's Lynn, and are now in the possession

of Mr. Mortlock, of Orchard-street, Portman-square. The house was originally inhabited by the Taylor family, and a Sir Simon Taylor is said to have lived there when he carried on the business of a wine merchant, and contested King's Lynn against Lord-Keeper North. The mantelpiece measures about 10 ft. across, and is 11 ft. in height. In the centre are the Royal arms, France and England quarterly,—and the mottoes "Hony soyt qui mall pences," and "De it mon drot." On each side are grotesque standing figures or caryatides, supporting a deep frieze and cornice, richly-carved and moulded. The whole is supported by coupled Corinthian columns standing on pedestals with carved panels. It is entirely of wood, and in fine preservation, the sharpness of the work, especially in the Royal arms in the centre, being particularly noteworthy.

The room itself, which is complete, with its windows, cupboards, &c., is panelled throughout. At the angles are Corinthian pilasters, fluted, with good panels on the pedestals. Above the columns are lions' heads and a rich frieze, the carving being varied, in some parts conventional, and in others representing various forms of grotesque animals. In taking down the panelling in an adjoining room the date 1692 was found, which probably marks the period of this work also. It is probably Flemish workmanship.

#### HOUSE AT LEEDS.

THE drawing from which the accompanying view is taken is hung in this year's Academy. The building is erected of stone, with the upper portion covered with rough-cast, relieved by a little tile-hanging. The roofs are covered with red tiles. The sanitary arrangements are stated



to be very complete. The house, which has been erected for Mr. Lupton, occupies an elevated site in the outskirts of Leeds, the view to the east being very fine. It is to obtain these from the windows of drawing and dining-room that the break, shown in plan, has been arranged. The architects are Messrs. Chorley & Connon, of Leeds.

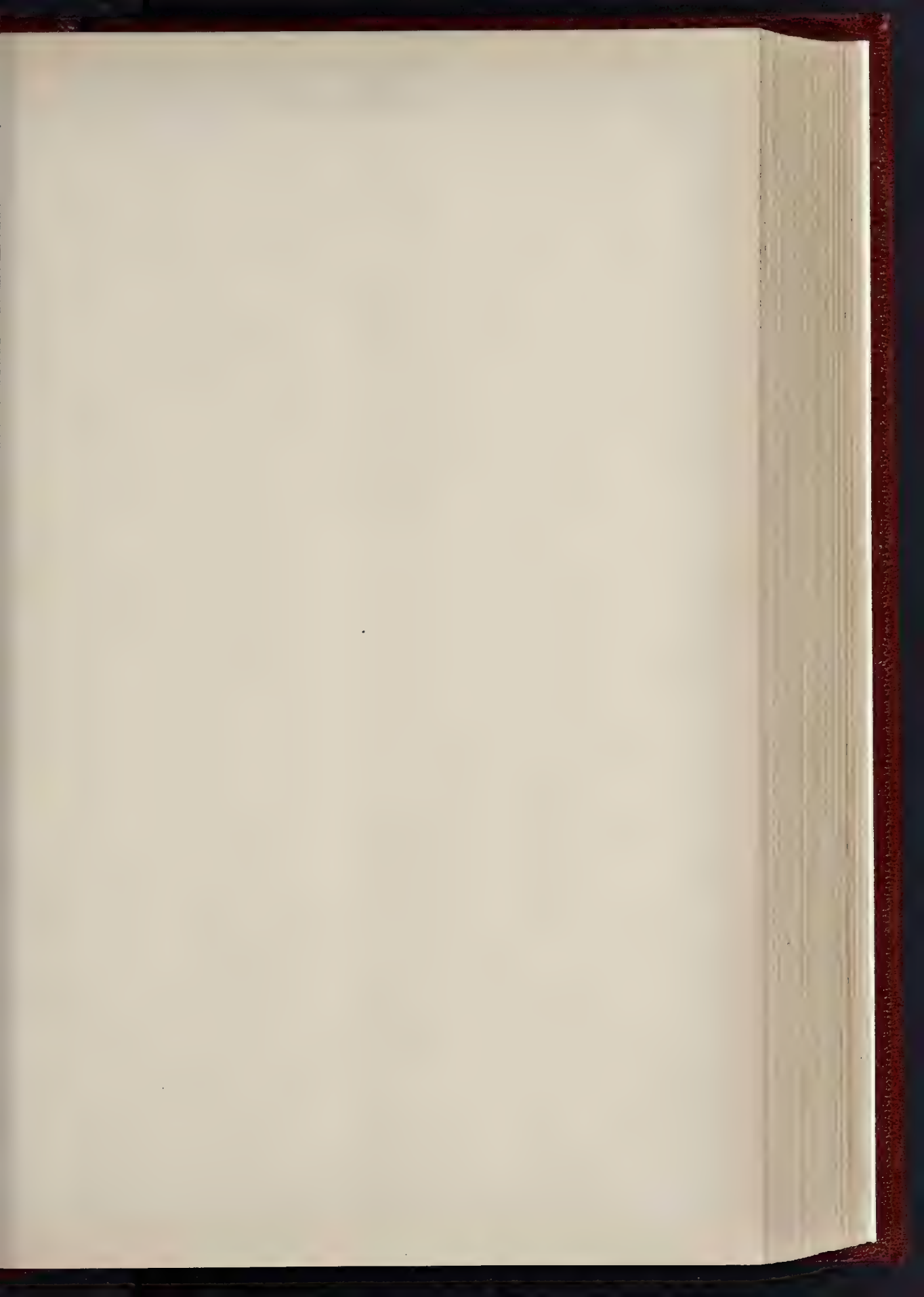
#### FARM BUILDINGS, GLEDHAW HALL, LEEDS.

THESE buildings have been erected for Sir James Kitson, Bart., in connexion with a small home farm attached to the hall. Whilst simple in treatment, a certain picturesque quality of appearance has been given by the outline of plan and elevation, and by the use of a little half-timbered work and tile-hanging. The materials used are stone, the roofs being covered with red tiles. The architects are Messrs. Chorley & Connon, of Leeds.

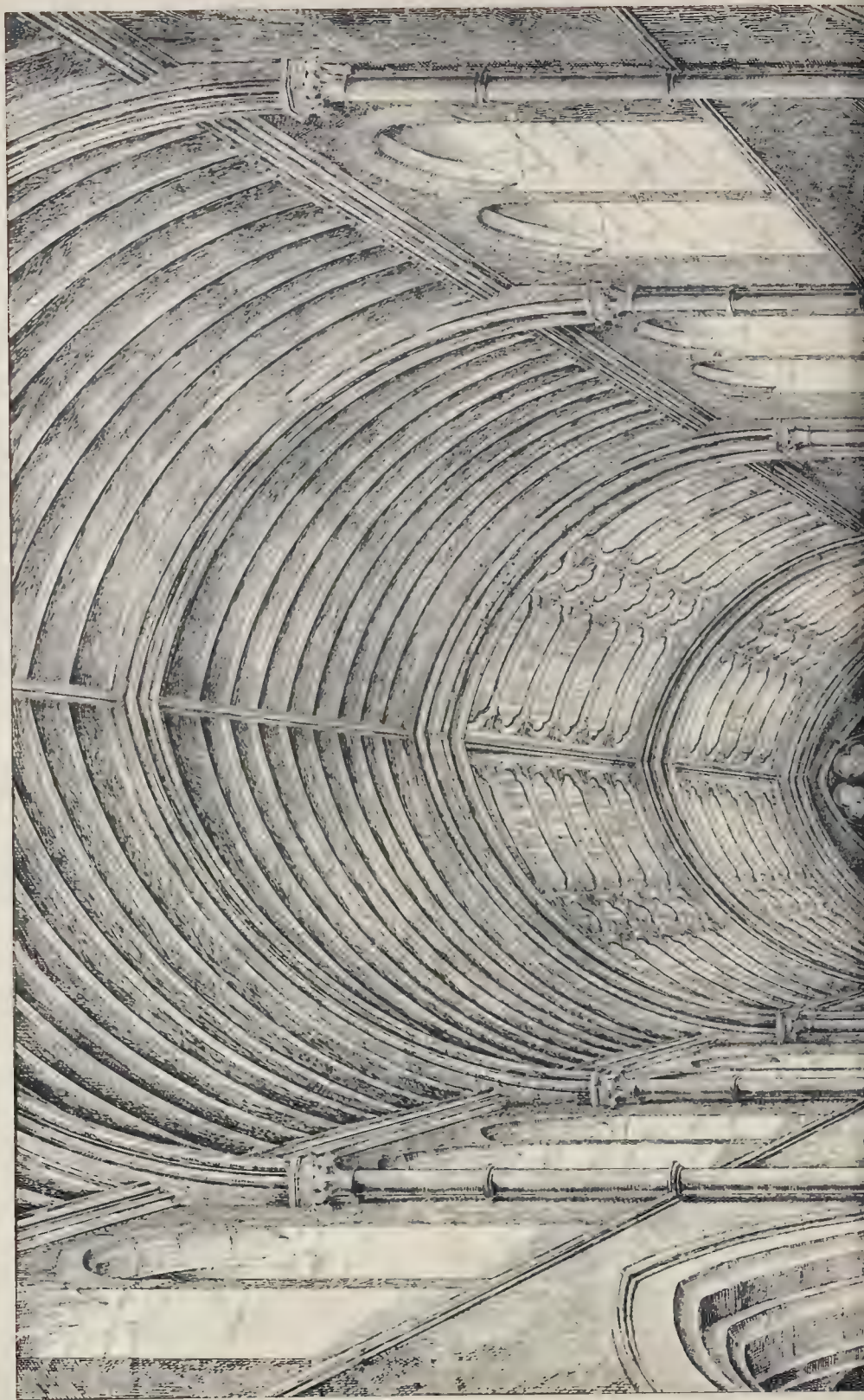
"Old Cottage Architecture."—Next week we propose to publish a further instalment of Mr. Ralph Nevill's "Old Cottages."

Association of Municipal and Sanitary Engineers and Surveyors.—It is announced that the next Examination of candidates for the offices of Municipal Engineer and Local Board Surveyor will be held under the auspices of this Association at the Institution of Civil Engineers, Great George-street, Westminster, on Friday and Saturday, October 26 and 27 next. Applications for this Examination must be sent in not later than September 5.

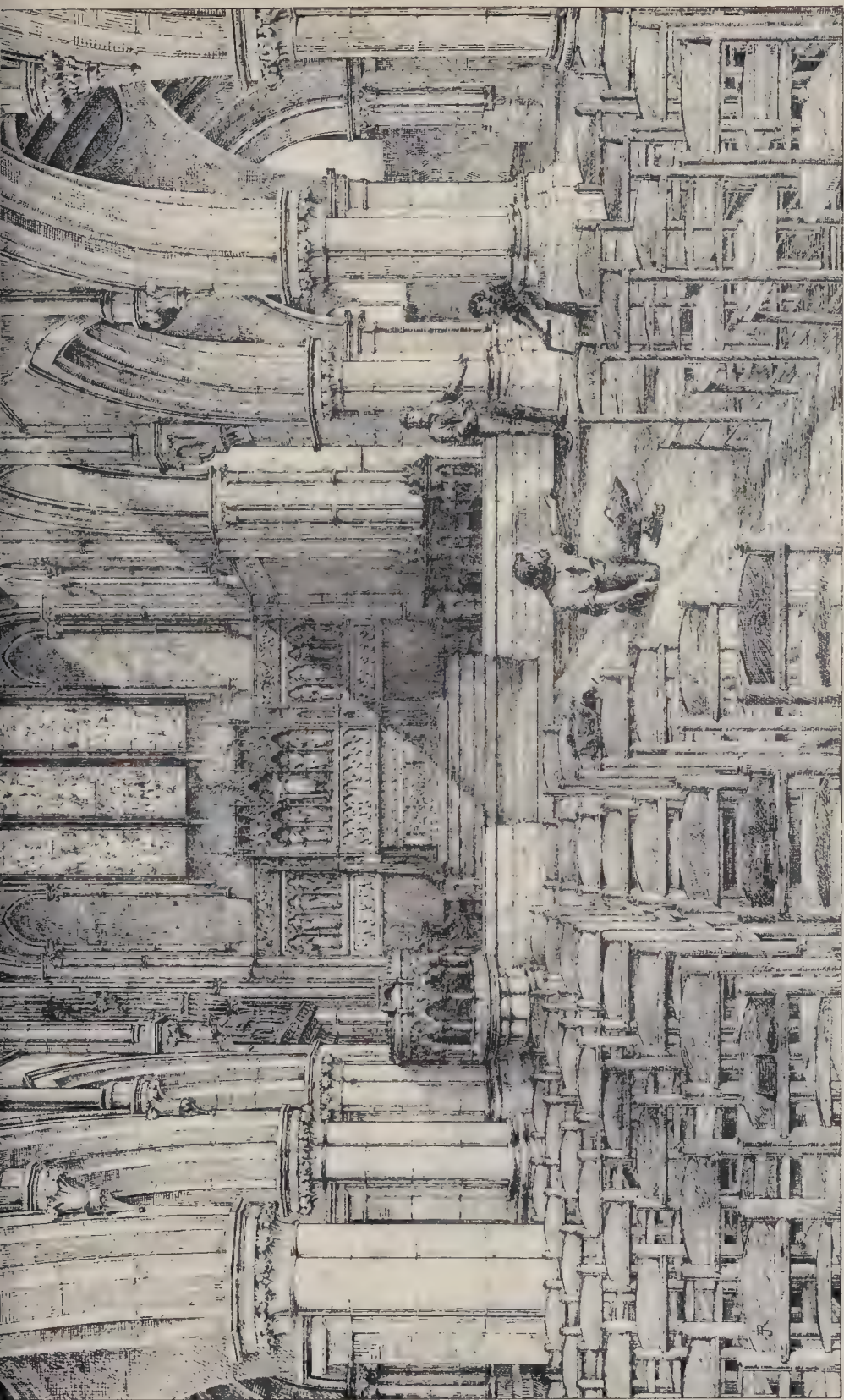




THE BUILDER, AUGUST 19, 1889.



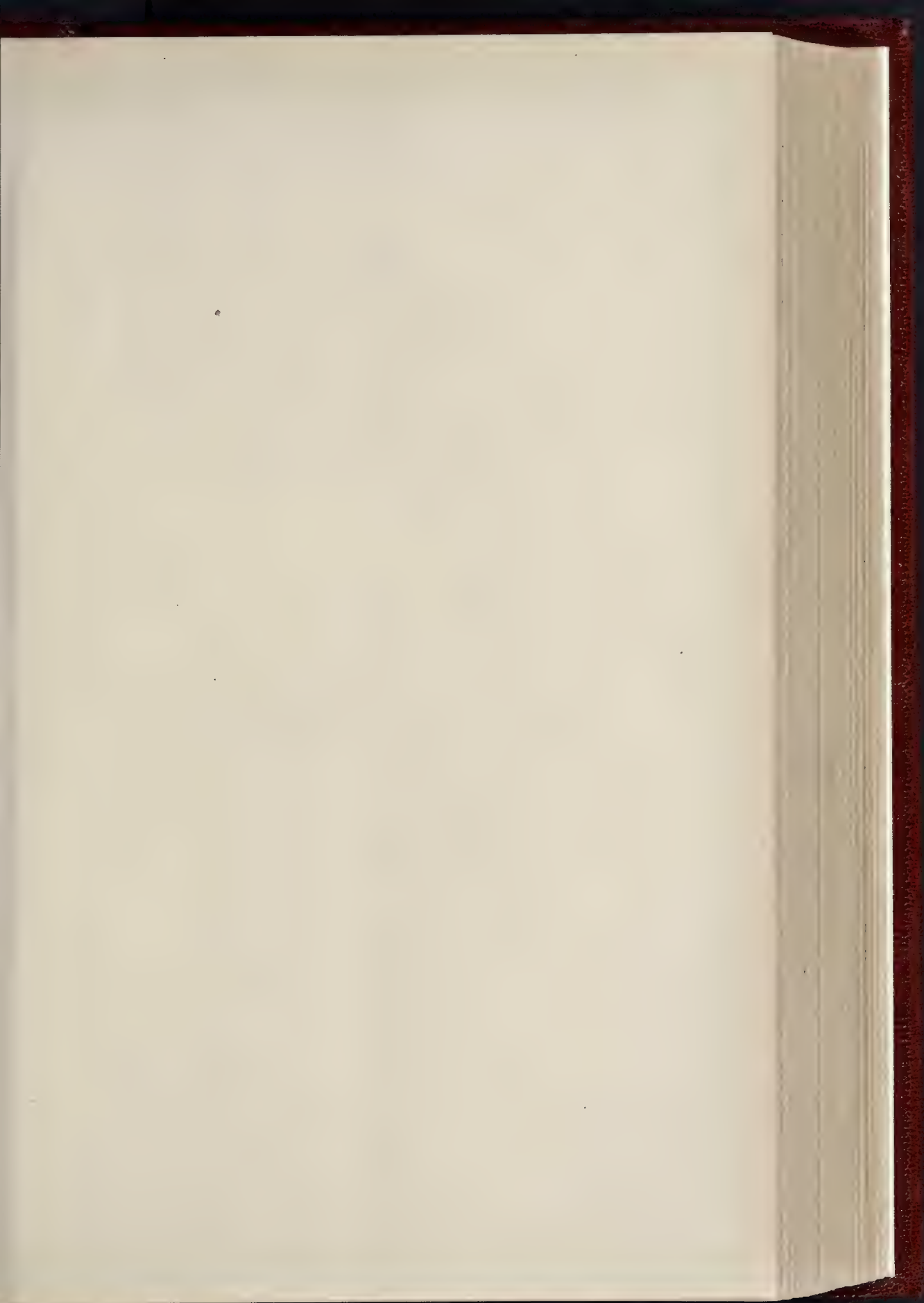




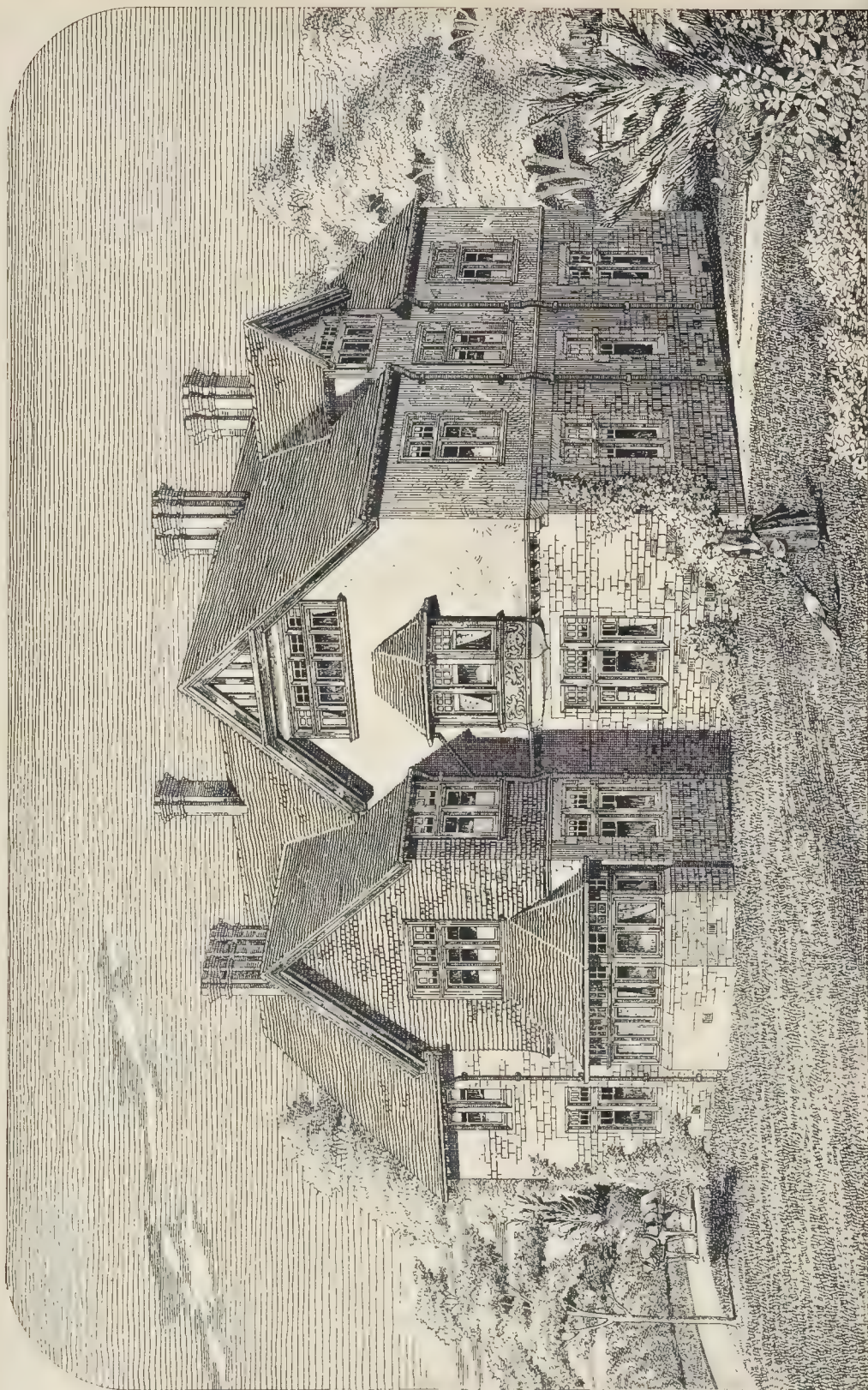
CHURCH OF ST. ANNE, ROATH, CARDIFF: INTERIOR LOOKING EAST.—MR. J. ARTHUR REEVE, ARCHITECT.



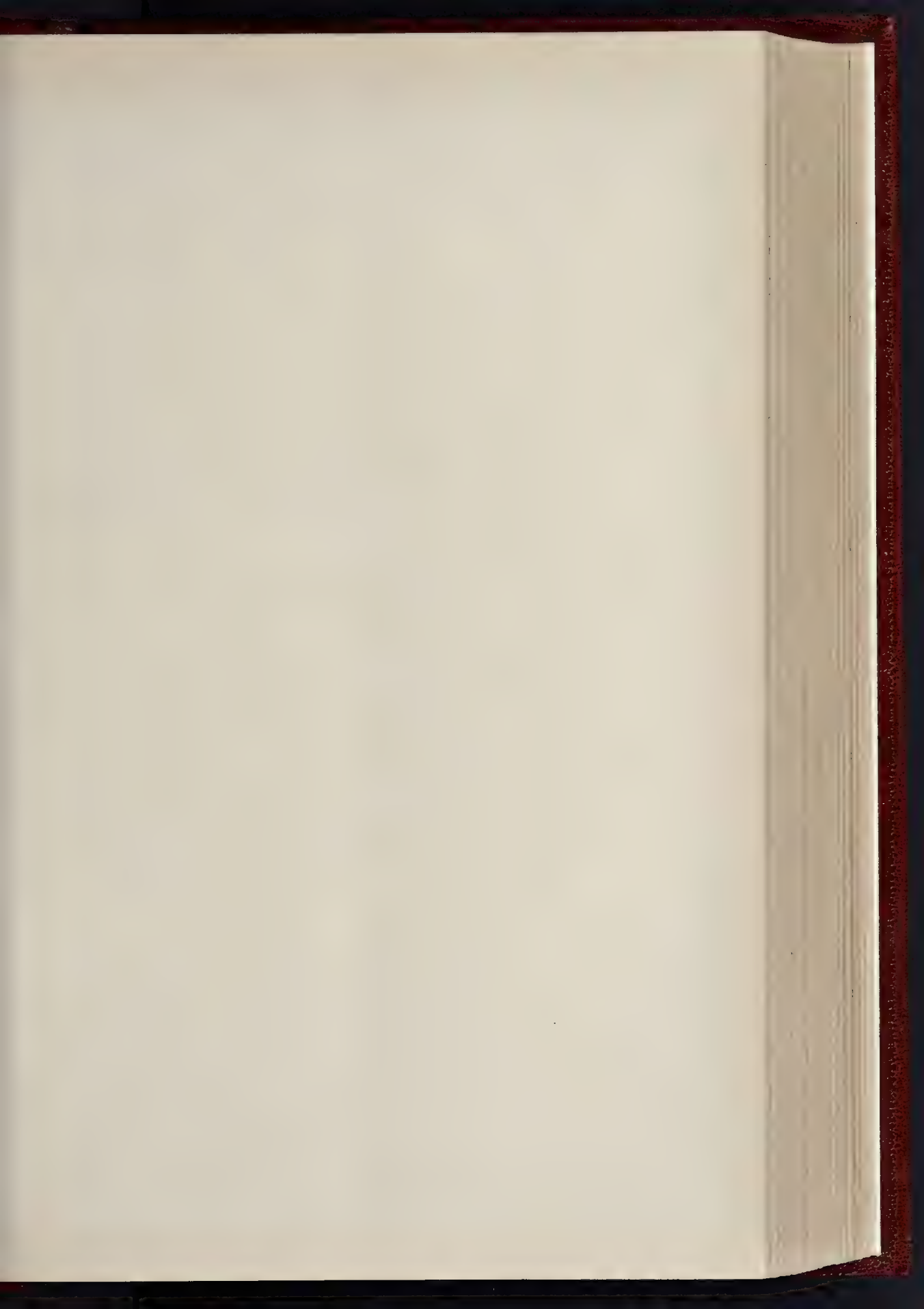




THE BUILDER, AUGUST 16, 1898.







THE BUILDER, AUGUST 18, 1888

Elizabethan Room from  
House in Queen Street,  
King's Lynn, Norfolk.

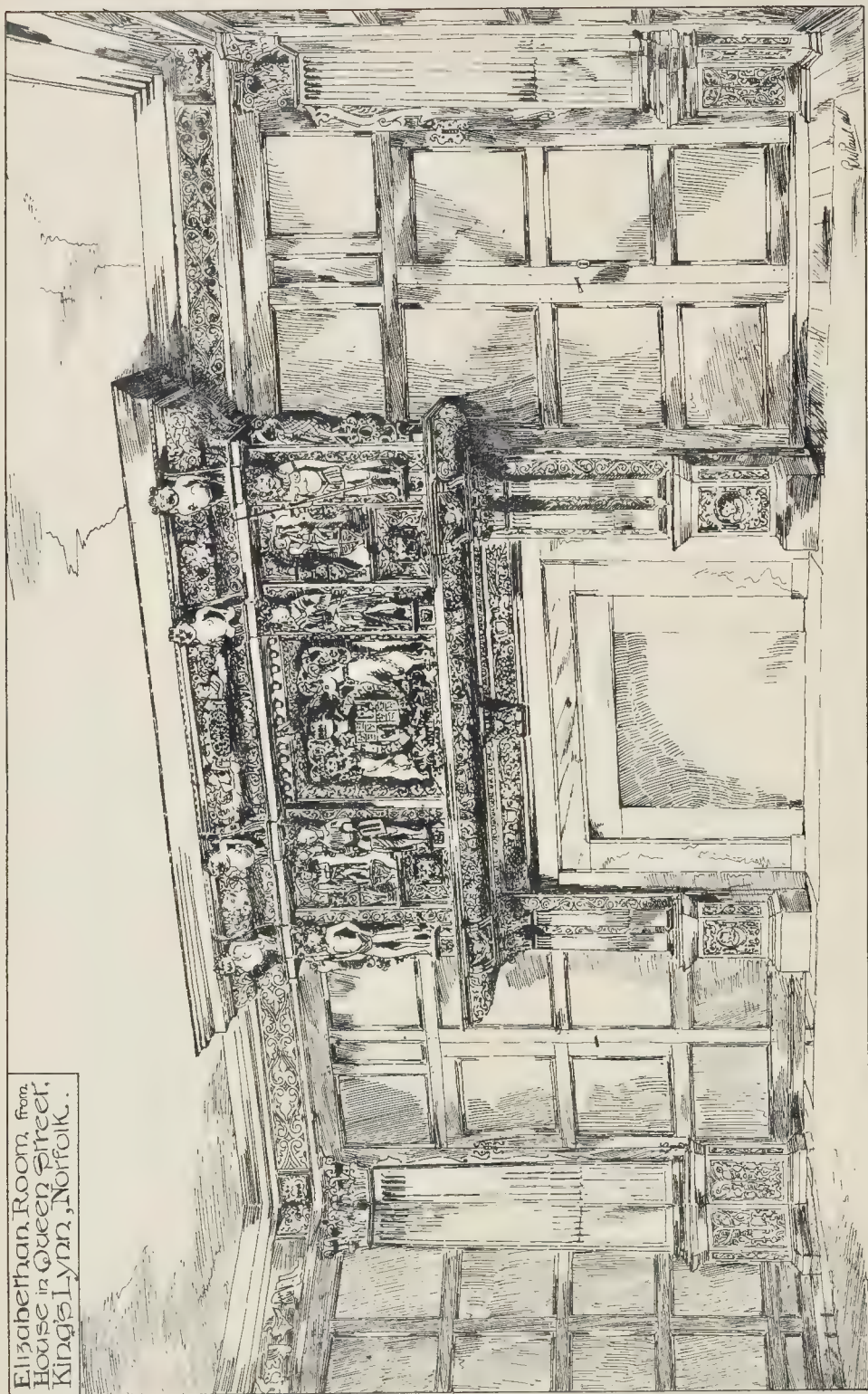
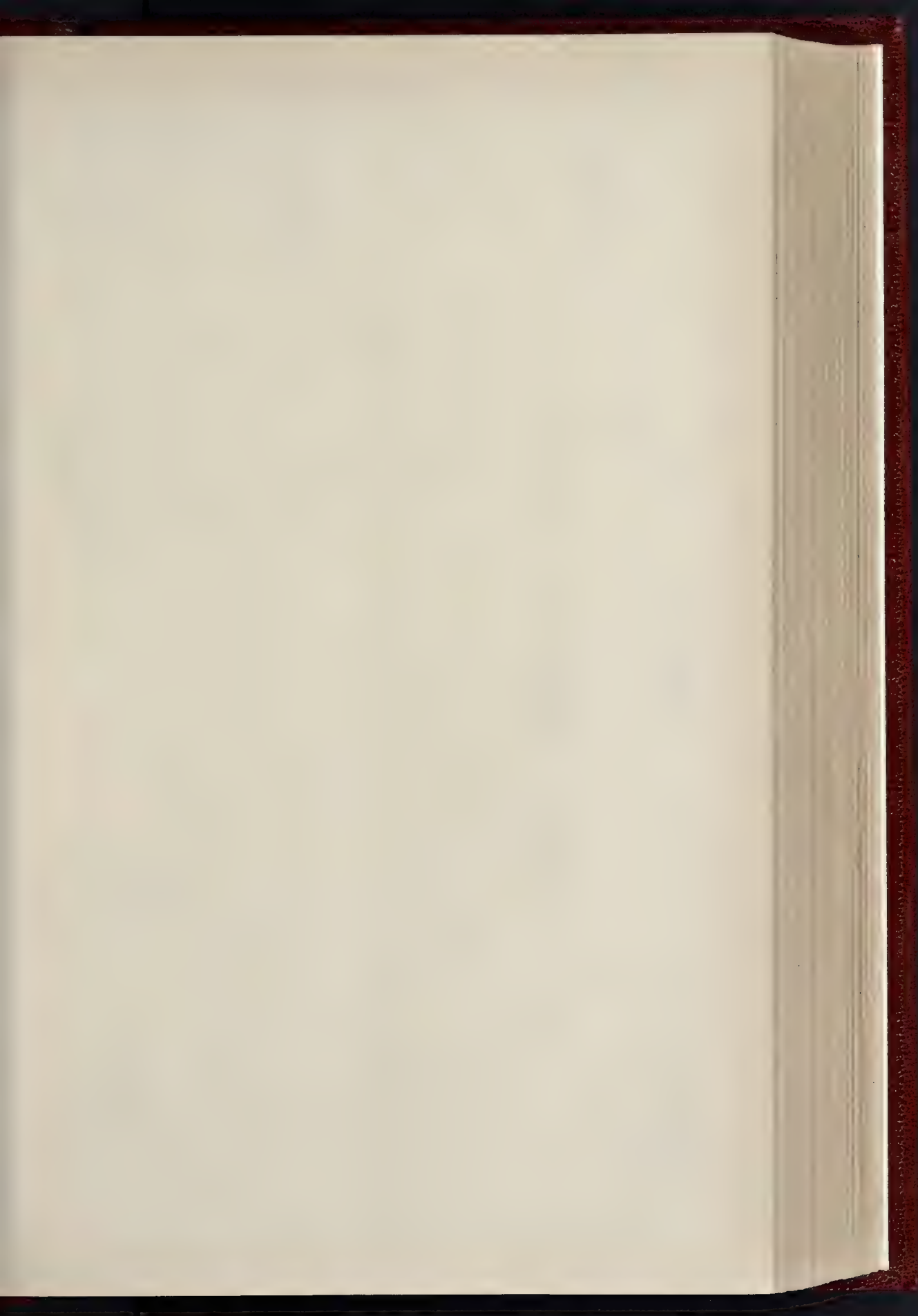


PHOTO BY THE GERRARD & CO. 22, MARK LANE, LONDON. A. J. J. J. J. J.





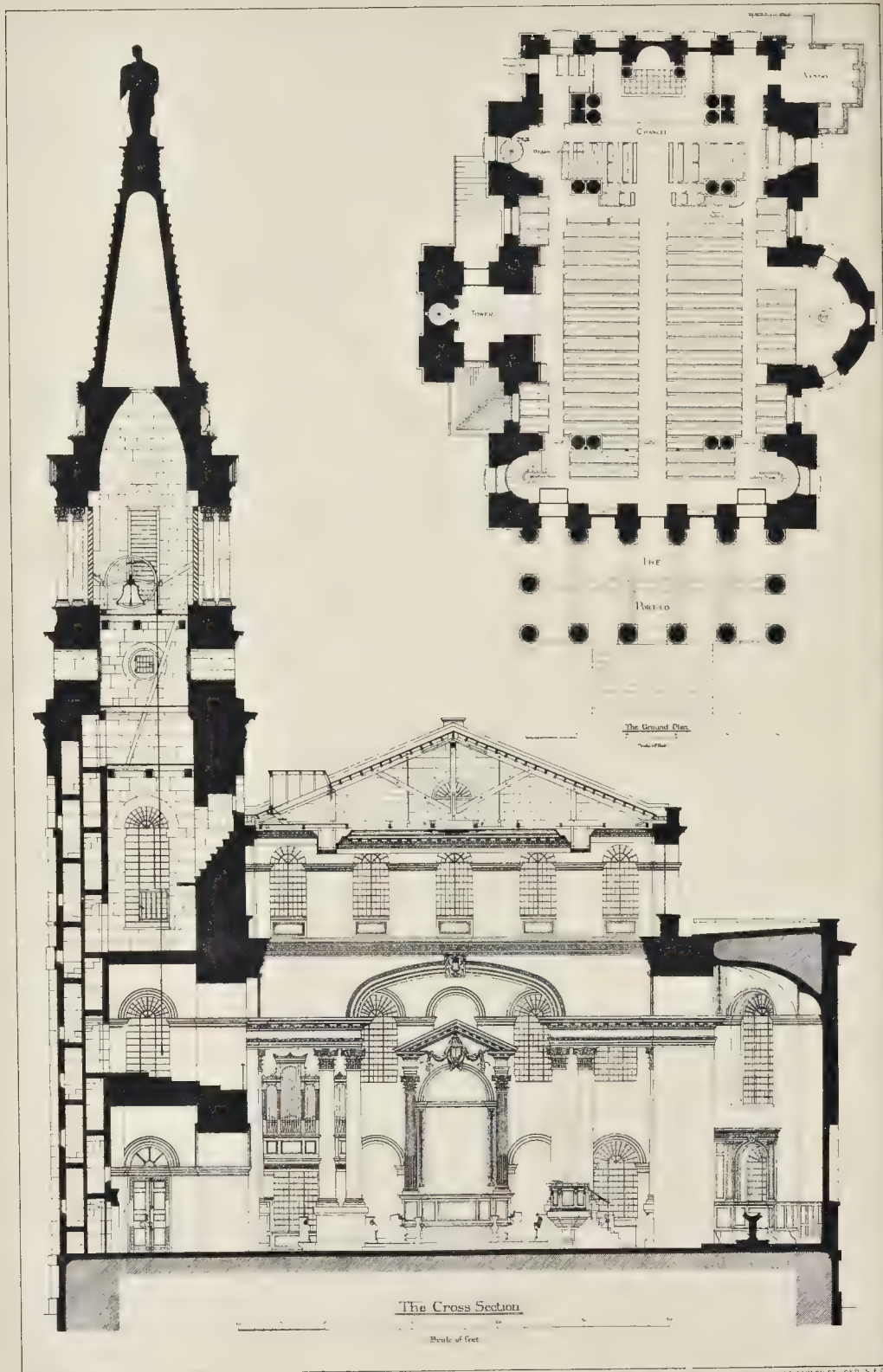


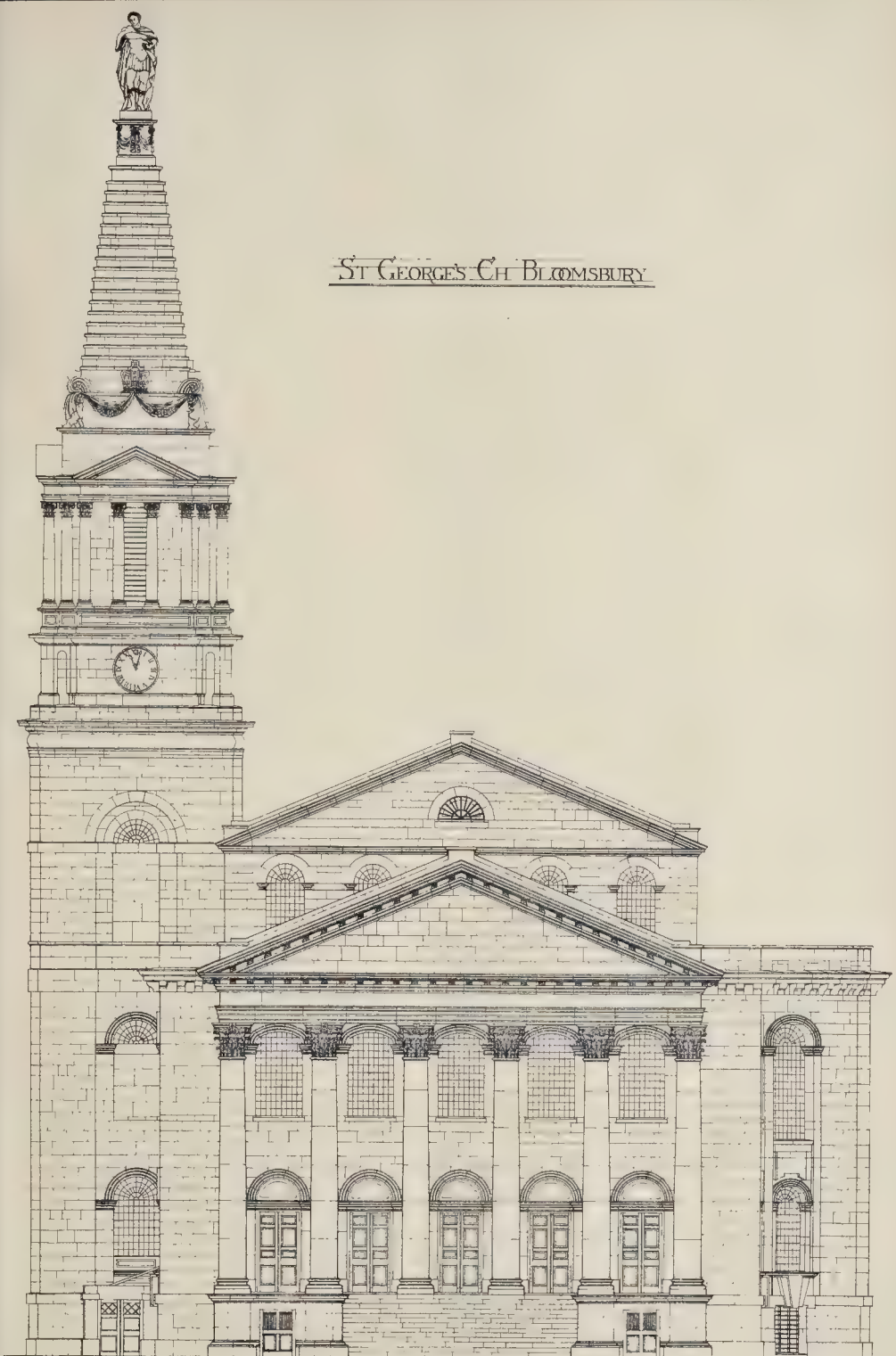
PHOTO. THE SPRING & CO. 22, MARTIN LANE, LONDON, E.C. 4.

ST. GEORGE'S CHURCH, BLOOMSBURY.—MEASURED AND DRAWN BY MR. P. N. GINHAM.

R. A. Silver Medal, 1867.



ST GEORGE'S CH BLOOMSBURY



Elevation to Fleet Street

20 feet

PHOTO-LITHO, SPRAGUE & CO 82, MARTIN LANE LONDON E.C.

ST. GEORGE'S CHURCH, BLOOMSBURY.—MEASURED AND DRAWN BY MR. P. N. GINHAM.





# ST. GEORGE'S CH BLOMSBURY

Details :

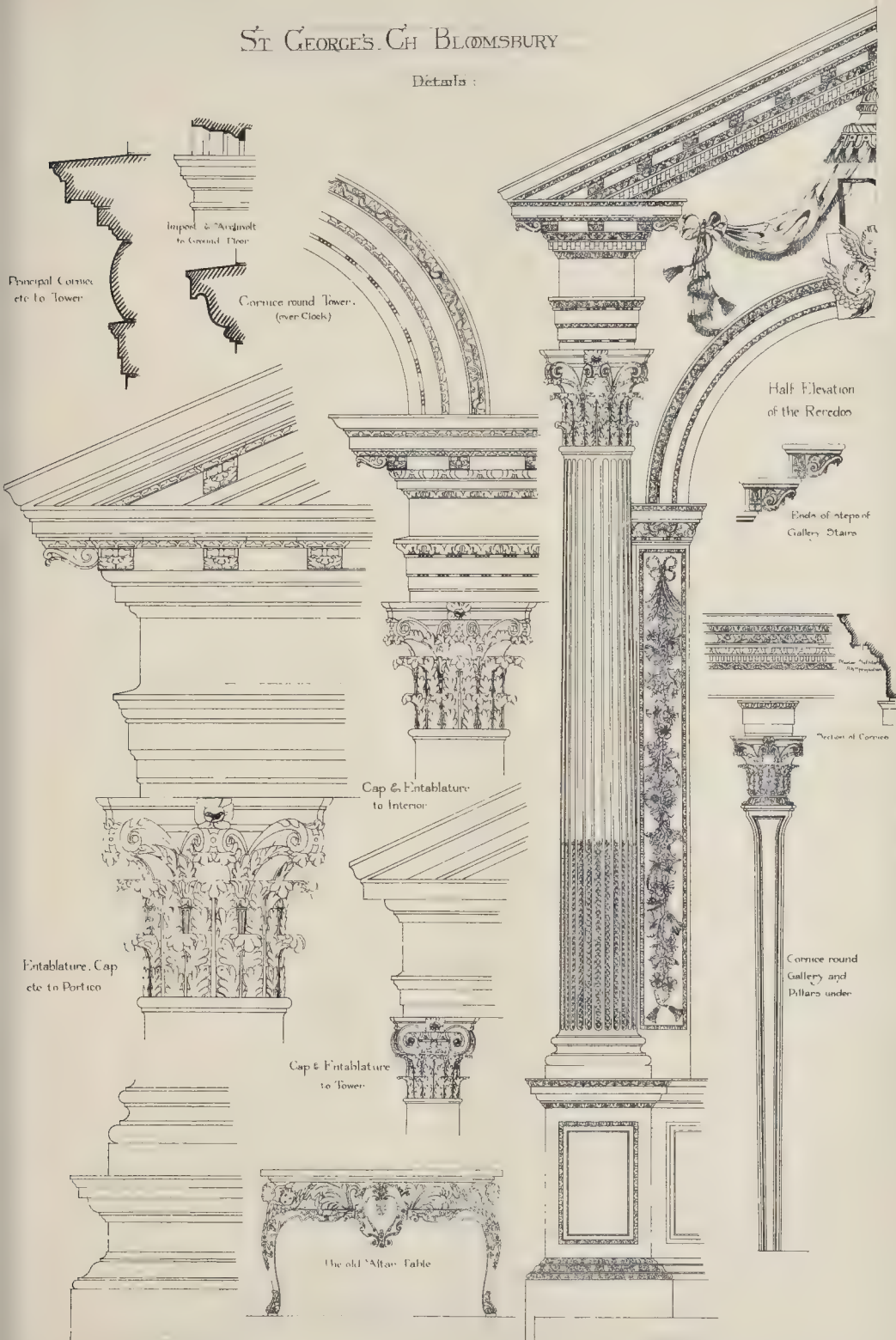


PHOTO LITHO, SPRAGUE & CO 22 MARTINS LANE CANNON ST LONDON, E.C.

ST. GEORGE'S CHURCH, BLOOMSBURY.—MEASURED AND DRAWN BY MR. P. N. GINHAM.

. Silver Medal, 1887.







FARM BUILDINGS, GLADHON HALL, NEAR LEEDS.—MESSRS. CHORLEY & CONNOR, ARCHITECTS.





## TWO CASES UNDER THE CITY OF LONDON PAROCHIAL CHARITIES ACT, 1883.

Two interesting actions have lately been tried in the Chancery Division of the High Court of Justice relative to some ancient City charities. In one case a petition was preferred by the rector of St. Mary-le-Bow and the churchwardens of St. John the Evangelist, under the City of London Parochial Charities Act of 1883. It appears that by his will, dated in 1862, one William D'Aunre provided for, *inter alia*, the holding of certain masses in St. John the Evangelist, the chantry priest to receive "eight marks of silver for his stipend" in that behalf. The church, known as St. John-the-Baptist-upon-Walbrook, its western end resting upon the brook's bank, was not rebuilt after the Great Fire. It stood just north of the cross of Cloak-lane and Doggate-hill. A dispute with D'Aunre's heir, who claimed that the will was inoperative, was settled by the purchase of his interest therein by the parish. After the Fire the parish was united to that of All Hallows, Bread-street. The records show that for a long time, certainly from 1667, the parish of St. John had possessed a freehold, being now No. 14 in Watling-street, whereof the profits were applied to church purposes, and an annual payment made therefrom of 54. 6s. 8d. to the rector. On the demolition of All Hallows, Bread-street, thirteen years ago, an Order in Council was made for the joining to the mother church of St. Mary-le-Bow, the four parishes (being without churches of their own) of St. Pancras, Soper-lane; All Hallows, Honey-lane; All Hallows, Bread-street; and St. John-upon-Walbrook.\* At the same time the charges of maintenance and of divine service at St. Mary-le-Bow, together with maintenance of the fabric, were cast upon the five parishes in proportionate parts. In their published "statement" for dealing with the St. John devise, under the above-named Act, the Charity Commissioners distributed the D'Aunre charities under two schedules. In the one schedule, entitled "Ecclesiastical Charity Property," they allotted annually 54. 6s. 8d. to the rector, and 80s. 17s. 9d. to parish ecclesiastical uses. By the other schedule, "General Church Property," they gave the remainder, being 161s. 15s. 7d., of the yearly income to the general uses of the parish. Relying upon the terms of section 10 of the Act, the petitioners claimed, in virtue of their vested interest in the endowment, that the entire income derivable from the Watling-street property should have been treated as "Ecclesiastical Charity Property," and so rendered available, under section 5, to divine service and maintenance and repair at St. Mary-le-Bow. The Commissioners replied that the petitioners were not, in their construction of the Act, persons having such a "vested interest" as is contemplated by section 7, which virtually excludes any person holding office or receiving emolument at another's pleasure.

Mr. Justice Kay was of opinion that the petitioners failed to make out their case. He held that inasmuch as the object of the D'Aunre charity was the repair of the church of St. John, an obligation which clearly ceased with the demolition of that fabric, it was in no way applicable to the repair of the church of the five united parishes. His lordship was satisfied that the Court had no jurisdiction under section 10, that the petitioners possessed no such vested interests over the whole property as they claimed to possess under section 7; and that, consequently, the Court could not make the declaration asked for. The petitioners were allowed their costs from out of the trust estate.

A somewhat similar suit was heard in the same Court *in re* the parish estates of St. Alphage, London-wall. The property in question, as hitherto vested in the parson, churchwardens, and parishioners, and applied to general church purposes, consists of (1) Nos. 132 and 133, London-wall, (2) some houses lying west of the old grave-yard, and (3) Nos. 14, 15, and 16, London-wall, between the church and Aldermanbury. The last-named stand over the site of northern aisle of the former (and second) parish

church, as made out of the dissolved priory of St. Mary, *antique* the Elsyng Spital. The two other blocks of buildings stand west and east respectively, of Aldermanbury-postern and Cripple-gate-buildings, having between them the detached grave-yard that is bounded by a remaining portion of the City wall.\* They were included in a lease for 1,000 years given by the Corporation of London, in 1587, to Alderman Sir Rowland Hayward, who by his will of 1587 devised the lease to the parson, churchwardens, and parishioners "for the relief and maintenance of poor, aged, impotent, and diseased persons of the said parish." The Charity Commissioners determined the three properties to be charity property, and schedule them in their statement accordingly. The petitioners asked for a declaration, under section 10, that they are not charity property, and should not, therefore, be vested as such in the Charity Commissioners. Mr. Justice Kay decided that the rents were impressed with charitable trusts, and that the whole of the properties are not ecclesiastical, but come within section 5 as appertaining to a charity whereof the income is applicable or applied to or for the benefit of the parish; and that the petitioners had no "vested interests" as contemplated by the Act—that term meaning only such as depend upon the receipt of remuneration from the out of the charitable endowment. So this petition also was dismissed; the Commissioners not asking for costs. Sir Rowland Hayward, who served as Lord Mayor in the year 1570 and latter part of the year 1590, died on December 5th, 1593. The monument to him, his two wives, and their sixteen children, with figures, has been preserved and set up in the existing church that was built in 1777, from designs variously ascribed to George Dance the younger, and Sir William Staines.

## COMPOSITION OF ANCIENT MORTAR.

UNDER the above title, the writer contributed a short paper to the *Builder* of May 12 last, and illustrated by means of chemical analysis the superiority of ancient mortar—such, for instance, as was used in the construction of old castles and churches many centuries ago compared with the ordinary mortar used in the present day.

It is not a little remarkable that in many building contracts the specifications contain no reference to the detailed composition of the mortar to be employed. They provide that the mortar shall be *good mortar*, but omit to describe what is meant by good mortar. This omission is much to be regretted, as in case of any dispute arising respecting the quality, there are no definite points to be inquired into,—such as the proportions of sand and lime, and the conditions in which these materials may exist in the mortar,—whether the sand is sharp, with an irregular surface calculated to bind, or whether it is comparatively smooth and round, as in the case of sea-sand, which possesses but little retentive property. Again, the nature and condition of the lime should be specified, and a limit placed upon the quantity that shall exist in the state of carbonate of lime, with a view of providing that the limestone shall have been properly calcined before being slaked into mortar.

Again, as was pointed out in the original paper, so much depends upon the selection of really good lime, because, if a superior quality is used, a smaller quantity will be necessary in order to make good mortar.

Architects are usually very anxious that plenty of mortar should be used in the courses, but good walls, with a particularly dry interior surface, can be built by using mortar only on the outer and inside course, the interior being filled with loose stones with a through one at irregular intervals. A good illustration of such walls, two feet thick, is presented at St. Mary's Church, Illingworth, Halifax, Yorks, where, in order to add a chancel, the east end has been opened out, showing a section of the north and south walls in excellent condition, very compact, and remarkably dry, though the situation of the church on the mountain-side exposes the building to the full force of the south-west gales.

A specimen of some of the mortar from these walls, which were built in 1777, is now furnished (No. 1) to show its superior quality, and for comparison with a poor mortar, No. 2, taken

from an old wall in the garden of Mr. Horace Gripper, Rennesley, Wades Mill, Ware. This wall is said to have been erected some two hundred years ago, and the mortar is soft and easily broken up, and is interesting as showing that in constructing ordinary out-door walls poor mortar was frequently used in days gone by, as in the present time:—

|                                           | No. 1.<br>Good<br>Mortar. | No. 2.<br>Inferior<br>Mortar. |
|-------------------------------------------|---------------------------|-------------------------------|
| Water, lost at 212° Fah. ....             | 1.64                      | 1.66                          |
| Loss on ignition.....                     | 2.59                      | 3.06                          |
| Lime.....                                 | 28.50                     | 24.75                         |
| Magnesia.....                             | .61                       | .19                           |
| Oxides of iron and alumina.....           | 3.45                      | 2.35                          |
| Potash.....                               | .33                       | .09                           |
| Soda.....                                 | .25                       | .16                           |
| Carbonic acid.....                        | 18.80                     | 17.13                         |
| Sulphuric acid.....                       | .73                       | .65                           |
| Chlorine.....                             | .05                       | .04                           |
| Silica (present as silicate of lime)..... | 11.30                     | 2.80                          |
| Insoluble siliceous matters.....          | 31.75                     | 47.12                         |
|                                           | 100.10                    | 100.10                        |
| Equal to carbonate of lime.....           | 42.72                     | 38.93                         |

It will be noticed that in the mortar No. 1 there is 11.30 per cent. of silica present as silicate of lime, such as occurs in good Portland cement, whereas in No. 2 there is only 2.80 per cent. In the former the mortar is very hard and difficult to separate from the stone and in the latter it is soft, friable, and easily detached from the bricks.

Further, on examining these mortars under the microscope, the sand in No. 1 is seen to be rough, with sharp edges, while in No. 2 the surfaces are rounded and smooth, and evidently indicate that at some time they have been exposed to the action of water, as would be the case with sea or river sand.

The importance of using sharp sand in the manufacture of good mortar cannot be too much insisted on, as also the importance of selecting a really good building lime which shall, on careful burning and slaking, furnish a mortar that shall possess the properties of a cement to a considerable extent, associated with those of ordinary good lime.

In other words, we should take care to select a good limestone, see that it is properly burned into caustic lime, and carefully slaked, avoiding an excess of water; finally, see that there should not be less than 33 per cent. of lime in a sample of the dry mortar, and certainly that no soil of a clayey nature should be used, but only good sharp sand.

If this be done, much less mortar need be used, and if the walls be two feet thick it will not be necessary to lay mortar over the whole course, but only on the outside and inside, the interior being filled with small loose stones, which will prevent the damp being transmitted from the outside—as so often is the case where inferior mortar has transmitted moisture directly to the inside, and caused serious damage. J. H.

## CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

THE Cambrian Archæological Association assembled for their forty-third annual Congress on Monday, the 18th inst., in the old Royal burgh of Cowbridge, or as the Welsh called it, Pontfaen, Glamorganshire. The rendezvous was well chosen, for this neighbourhood abounds with objects of antiquarian interest, prehistoric, Roman, and Mediæval. The district is, moreover, a happy hunting-ground for ethnologist, for, lying as it does within the confines of Siluria, we frequently come across descendants of those small black-haired people described by Tacitus, and believed by modern savants to have been the manufacturers of polished stone implements and the builders of cromlechs. There is no doubt that the Roman legions marched along the straight tracts that intersect the country. In Caer Worgan we have, according to tradition, the remains of a Romano-British town; stone crosses, ornamented with interlaced work, show indications of Gaelic art; and in later days this was the land which Fitz-Hamon and his twelve paladins first snatched from the Welsh.

The first business of the Association was to meet their newly-elected President, the Bishop of Llandaff, in the Town-hall, kindly lent for the purpose by the Mayor and Corporation of Cowbridge. In the inaugural address, his lordship congratulated the Association on the rich

\* Soper-lane is now Queen-street. All Hallows, Honey-lane, stood in Honey-lane marker, on the site that was until 1882, occupied by the City of London School. St. John the Baptist church is so cited in Dean Ralph de Diceto's survey, of circa 1200; the churchyard was scheduled (1879) in the Metropolitan and District Railways Bill, but was saved from utter annihilation by the City Church and Churchyard Protection Society's interposition—partially successful.

\* This fragment contains traces of the parapet battlements. The battlements were removed from the adjoining portion in St. Giles's churchyard many years since.



field they had selected for their investigations. They would no doubt see at Dyffryn one of the grandest cromlechs in Great Britain, and at Baydon Hill, near Bridgend, a vast prehistoric earthwork would exercise their ingenuity. Roman roads and strongholds showed us the means used by the masters of the world to conquer the country, while unfortified Roman villas proved how very complete that conquest had been. In the train of the Roman legions followed those missionary priests to whose exertions we owed the blessings of Christianity. The Northern invaders for awhile swept away civilization; then Fitz-Hamon and his followers arrived on these shores. Norman rule was not, however, accepted readily by the Welsh (perhaps it proved more severe than had been the Roman domination), and the innumerable castles we found in Glamorgan were the result of this struggle. Every little landowner seemed to have built a strong house for his own protection, a refuge of this nature being absolutely necessary. In the immediate district one might count up twelve castles in six miles; among these St. Donats and Fommon were very notable specimens of Medieval architecture. The parish churches, again, were not the least interesting archaeological features in the land of Morgan, which was the very cradle of British Christianity, for to this day men worshipped on sites consecrated in the fifth century by Saints Germanus and Dubricius.

Archdeacon Thomas proposed a vote of thanks to the President, which was seconded by Mr. R. Banks, Treasurer of the Association, and carried with acclamation.

A very interesting paper on recent excavations and discoveries in the Black Friars' Priory at Cardiff, written by the Rev. John Placid Conway, Professor of Sacred Theology to the College of Black Friars at Stroud, was then read by the General Secretary (Mr. E. Laws), which terminated the proceedings of the opening meeting.

On Tuesday morning, in unworldly sunshine, the members drove along the old Roman road to St. Hilary's, where the Vicar, the Rev. Lewis Morgan, conducted them over his church, an edifice which, in the opinion of some of the party, was somewhat over-restored by the late Sir Gilbert Scott about a quarter of a century ago. Near at hand is Old Beaupré (pronounced Buper), a house of the Bassetts, which has fallen into ruin within the memory of those living. It is a huge pile of buildings, too large, perhaps, for the property. The most noticeable features of these ruins are the entrance-gates, extremely ornate productions in late sixteenth century taste. Over both is the Basset motto, that now born by the Welsh Regiment, and concerning which there has of late been much discussion. The outer gate is dated 1581; here the motto reads

"Gwell angary na chwylyd."

The inner and most ornate gate bears the date 1600, and the legend runs—

"Gwle angary na chwylyd."

so that it seems opinion was somewhat divided as to the spelling of this unfortunate motto three centuries ago.

The next stopping-place was St. Athan's, where is a cruciform church with a central tower, an Early English chancel arch, and two interesting monuments to the Berkrolle family, the knights garbed in armour, partly chain, partly plate—the dames in coifs and twelfth-century garments. From St. Athan's the party proceeded to Gileston, a parish and manor surrounded on three sides by St. Athan's, on one by the sea. The church is a toy, standing in a flower-garden. Like most of the churches in the Vale of Glamorgan, it has a road staircase in the thickness of the wall; the road-loft was lighted by two tiny windows, seemingly Early English.

From hence the excursionists passed on to Fommon, a house of few masters. Mr. Oliver Jones met the party, and most hospitably conducted them over his interesting castle, and showed them the treasures contained therein. He said that Fommon was probably built by the St. John family between 1150 and 1200, and that subsequently by marriage they absorbed their superior lords, the Humphreys. This house remained in the hands of its founder's family until the year 1654, when it was purchased from the St. Johns by Colonel Philip Jones, the Parliamentary Governor of Swansea, who, being blessed with a son, persuaded the Lord Protector to stand sponsor to the child, and called his name Oliver. As may be supposed in a house which has seen

so few changes, many treasures have accumulated. Over the hall fireplace hangs a portrait of Col. Philip Jones, the purchaser of Fommon; nearly facing him is a portrait of Ireton; in the gallery is a remarkable picture of Cromwell, said to have been painted by Barber. In this portrait Oliver is represented as a man of about thirty, with a refined type of face and melancholy eyes, the same individual, no doubt, whose truculent, masterful visage we know so well, but in a different mood. Upstairs Mr. Jones had laid out some of the valuable documents preserved in the Castle. Among them was a warrant under Oliver's privy seal (1657) to pass Sergeant Seys. In another (1662) we find a pardon for the same individual granted by Charles II.

Fommon Castle consists of a square Early English tower, with two flanking towers, and later additions; the outworks are gone, but it is an exceptionally interesting building. For about 700 years it has been in the hands of two families, and has never been uninhabited.

From Fommon the visitors passed along "The Holy Valley" to Llanowan, an extremely interesting church, repaired (not "restored") eleven years ago. Within it there are a canopied screen and some fine Tudor windows.

The party were most kindly entertained at Llantrythid by Col. Trevor Tyler, and inspected the remains of the great manor-house. Nowhere is this class of building so frequent as in the Vale of Glamorgan, and the question arises, Whence did the rents come by which they were maintained? The source appears to have become exhausted, and the buildings fallen into ruin during the present century.

In the evening a meeting was held in Cowbridge Town Hall, under the presidency of Archdeacon Thomas, and papers were read by Mr. E. Owen, "On English Influence in North Wales," and by Mr. A. Corbett, on "The Customs of the Manor of Llanbithian."

We will continue our report of the meeting next week.

#### THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION: FURTHER EVIDENCE.\*

THE Royal Commission appointed to inquire into the working of the Metropolitan Board of Works held its twenty-fourth, and probably its concluding, sitting in public (so far as the taking of evidence is concerned) on Tuesday last, when Lord Herschell, the President, at the close of the proceedings, said:—

The Commissioners, having taken all the evidence which appears to them material, and that is at present available, propose now to adjourn *sine die*. They desire to thank all who have assisted their inquiry. They would especially express their obligations to the solicitors to the Inquiry Committee for the care with which they have investigated some of the many communications which the Commissioners have received. They desire also to state that they have received from the Metropolitan Board all the information—documentary and otherwise—which they have called for, and that this information has been readily supplied, and without delay.

With the view of completing our record of the most salient points of the evidence tendered before the Commission, so far as it is of special interest to our readers, we this week devote some space to a continuation of our summary, which we hope to complete in our next two or three issues.

Mr. Horace Gundry, F.R.I.B.A., District Surveyor of Paddington, recalled, was further examined by the Chairman as to the circumstances connected with Whiteley's building, of which, it will be remembered, Mr. Saunders, then a member of the Board, was the architect. Mr. Gundry said that the building in question had since been destroyed by fire. He attended the Building Act Committee of the Board in reference to the matter, and was there told (he could not now say whether by the Chairman or by the then Superintending Architect) that the Board was advised that the building in question was not a warehouse, and that, not being *ejusdem generis* with a warehouse, it did not come within the requirements of the Act as to the limitation of cubical con-

tents. In 1879 witness received a notice from Mr. Brass, the builder, of his intention to erect two more warehouses for Mr. Whiteley, the dimensions of which were in excess of the cube limit. Witness wrote to Mr. Vulliamy, the then Superintending Architect of the Board, to acquaint him of it, and Mr. Vulliamy replied:—"If the doubt expressed by you as to the size of the so-called 'warehouses,' now being erected for Mr. William Whiteley in your district, is similar to that which was considered by the Metropolitan Board with reference to a warehouse built by him in '75, I think you may safely take the decision then arrived at by the Board as your guide in the present instance. It appeared from the statements which were then made that the building to which exception had been taken was to be used for the purposes of a retail shop only, and not as a warehouse within the meaning of the 27th Section of the Building Act, and the Board, having regard to this fact, considered proceedings unnecessary. It may be reasonably assumed that new buildings are required to afford increased accommodation for carrying on the present business in the absence of any evidence to the contrary." These and other buildings, said the witness, went on, and were finished in 1880. They had since all been burnt; some parts, including a part built in accordance with the Act, had been burnt twice.

Mr. Augustus Harris, recalled, said he had never requested Mr. Hebb to ask for theatre-tickets. (Mr. Hebb explained that Mr. Harris's manager refused to admit him by what he called "face presentation," but told him that if he wished to come to the theatre he must write to Mr. Harris.)

Lord Magheramorne (formerly more familiar as Colonel Hogg, then as Sir James Hogg, and, more recently, as Sir James McGarel-Hogg) was the next witness called. He said, in answer to Lord Herschell, that he was elected Chairman of the Board in 1870, on the death of Sir John Thwaites. He was at that time elected for one year, at the instance of the Government of that day, who said they were going to alter the government of London,\* and he had since been elected by the members of the Board as their Chairman every successive year for a period of eighteen years. The Chairman-ship was from the outset a salaried office. Sir John Thwaites received a salary of 2,000*l*. When he (witness) was elected he received 1,500*l*. a year, and the salary was subsequently raised, after a good many years, to 2,000*l*. In addition to presiding at the weekly meetings of the Board, on Fridays, he always presided at the meetings of the Works and General Purposes Committee, on Mondays. He was a member of every committee and of every sub-committee of the Board, and he attended as many of their meetings as it was possible for him to do. He usually attended the offices of the Board every day. The witness described in great detail the working of the various departments and committees of the Board, and the duties of the various officers. With regard to street improvements, such as Shaftesbury-avenue, the course of procedure was as follows:—The Engineer first of all laid out the line of street, and then the Architect plotted out the surplus land in such manner as he thought would be most conducive to the public interests. When that was done, the Architect put a value on each site. In days gone by, notices used to be put up inviting tenders, and the tenders were brought in every Monday at half-past twelve, and opened by witness, who would then say to Mr. Vulliamy, "Is this near your valuation?" Mr. Vulliamy would reply, "It is close to my valuation." Then, generally speaking, Mr. Vulliamy was instructed to negotiate up to his valuation. If a tender were not near the Architect's valuation, then the order of the Board to refuse the application was moved, seconded, and passed, and the applicant had to tender again, if he still desired to get the site. At the present time that was not the course adopted. The witness was asked by Lord Herschell whether he was ever under the impression that the people who tendered were tendering with any knowledge of what the Architect's valuation was, or of what was likely to be accepted. In reply, he said he had not the faintest idea that people tendering had any

\* For summary of previous evidence see the *Builder*, pp. 8, 41, 66, 84, 104, *ante*, and last volume, pp. 133, 146, 166.

It has previously been stated by Lord Herschell that the Report of the Commissioners will probably be issued in about two months hence.

\* It is a notable coincidence that, as our readers will have noticed, this long talked of change has just been agreed through the Legislature. By Mr. Ritchie's Local Government Bill, the new Local Government for London will supersede the Metropolitan Board of Works in the course of a few months.



knowledge of what value had been fixed, because when he had been in the chair, and some members had asked to know the architect's valuation, he, as Chairman, had repeatedly refused to allow the Architect's valuation to be divulged to anybody. At the present time another course was adopted, supposing there was any land, or other property, to be sold, the Architect, having consulted the auctioneer, arranged in his own mind what he considered ought to be the price. He (the architect) came to witness and gave him his reasons for it, and when the Architect had given his reasons, witness then either agreed with him or disagreed with them; he generally agreed with them, because the Architect knew more about the matter than witness did. Witness then took the paper and signed it, put it into an envelope and stamped it with his own private seal, and when the auctioneer got up to his rostrum the sealed envelope was handed to him. So that, as far as witness could see, it was impossible for anybody now to have any information whatever as to the valuation which had been put upon a property, because nobody knew it excepting witness and the Architect. Asked how the reserve used to be fixed before that, witness said it was fixed by the Architect, and he kept it to himself, and communicated to the auctioneer when he got into the box. Asked who knew the reserve price before,—i.e., under the old plan,—witness said that evidently the Architect must have consulted two or three people about it, and they must have told others. Asked when there was not any question raised, or any suspicion roused, with regard to the conduct of Mr. Robertson, witness said about twelve years ago, when a serious accusation was made against Robertson by a Mr. Fuller. The charge against Robertson then was that he had received some money for communicating some entry in a book of reference of property to be acquired by the Board. Witness brought the matter before the Works Committee, to whom Robertson declared most solemnly that he had never one what he was accused of, and, Mr. Fuller declining to come forward to substantiate the charge, the Board passed a resolution affirming that Robertson was not guilty. Last year, when the *Financial News* formulated its charges against Robertson, witness sent for him, and told him that the charges made against him were very serious, and that he ought to consult his relations and his solicitor to see whether he ought not to bring an action against the journal in question. Robertson took no step in the matter, which was then taken up by the Works Committee of the Board, and a sub-committee of seventeen members was appointed to inquire into the charges. The sub-committee met very often, and they could not get any evidence against Robertson. Of course he denied everything, and it ended in a verdict of "not proven." But he admitted the truth of the story that the reys were his brothers, and a vote of censure was passed upon him. After much discussion the Board, some members voting for his dismissal, it was resolved that Robertson be transferred from the architect's to some other department, but no other department of the Board being anxious for his services, the Board in the end passed a resolution to dispense with his services at the end of three months. Witness had not had any time the least suspicion of Mr. Goddard's integrity, and he was astounded when Mr. Selway came across and told him what had come out before the Commission about Goddard. Asked as to his knowledge of the connexion of Mr. Saunders and Mr. Fowler, two former members of the Board, with buildings erected on Board sites, witness did he did know that those members were concerned as architects for buildings on one or two sites, but he certainly did not know what had come out before the Commission with regard to the theatres, &c. In answer to Mr. Renfrew, witness said that as Chairman of the Board he exercised a disciplinary control over the whole office, and if any member of the staff misconducted himself in any way the case came before him. If it were a minor matter he would deal with it himself, and lecture the offender, or have his chief tell him and tell him what he thought of the offender's conduct. If the misconduct were repeated by the same man, then he (witness) would be under the painful necessity of referring it to his colleagues, to be dealt with as they might think right. Asked whether he had the power of suspending an officer

temporarily until the question of his misconduct were brought before some committee or other, witness said he did not know that there was anything in the By-Laws of the Board about it, but he should not have had the slightest hesitation in suspending anybody if he thought he had done wrong, and witness would in that case report to his colleagues what he had done, and why, and then the case would be dealt with by some committee. The members of the Board were independent; he could do nothing with them if complaints were made as to their conduct. Any charge of misconduct against a member would have to be dealt with by the Vestry or District Board whose representative he was. Re-examined by the Chairman, the witness stated that some two or three years ago, or longer, Mr. Hare, the manager of the St. James's Theatre, made a complaint that Mr. Hebb had been applying to him for tickets. Witness at once sent for Mr. Hebb, and censured him, telling him that if such a thing ever came to his (witness's) knowledge again he should bring it before his colleagues with a view of dispensing with his (Mr. Hebb's) services. Witness did not at that time make the matter public in any way, but acted on his own responsibility, and gave Mr. Hebb a good lecture. He did not inquire of Mr. Hebb whether he had asked for tickets elsewhere. It never crossed witness's mind that Mr. Hebb would do such a thing. And if he (witness) might be allowed to say so, he thought that those who had kept these letters by them without informing him of their existence had behaved in a very reprehensible manner, both towards himself (witness) and the Board. If he had had before him the letters produced by Mr. Harris, he should at once have brought the matter to the notice of the Board. We must break off here.

#### CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

The Summer term of this School closed on Saturday last by an assembly of the usual kind in the South Tower of the Palace, and the presentation to the students of the Certificates awarded by the Examiners. The Chairman on this occasion was Mr. A. T. Walmisley, C.E., President of the Society of Engineers. The Examiners were,—for students in the first year's course,—Drawings, Patterns, and Fitting-work, Mr. R. H. Twigg, C.E., M.E.; in the second year's course,—Civil Engineering,—Mr. C. Wilson Moore, F.R.G.S., C.E., M.E.; and for the Electrical Department, Mr. Sidney Evershed, of the Society of Telegraphic Engineers and Electricians.

Mr. Shenton, Superintendent of the Crystal Palace School of Art, Science, and Literature, read the report of the Examiners, after which,

The Chairman addressed the students and their friends, who were assembled in the School. He congratulated the students, as well as the Principal and his staff, upon the highly satisfactory character of the Examiners' reports. From the knowledge he had himself acquired of the work done in the School, especially by the close acquaintance he had made with it as Examiner in the Civil Engineering section two years ago, he could believe the commendation well-merited. The work of the students showed aptitude and application on their part, and reflected the highest credit on the teachers. The students had entered upon a noble profession,—one that had perhaps done more than any other for the civilisation of the world. The success of workers in some other fields of labour benefitted certain parties, but the success of the engineer was of universal advantage. The subjects of study pursued in the School were admirably arranged, and its system was so carried out as to amply justify the full title of the School as one of "Practical Engineering." It combined actual practical work with the study of theory, and enabled students in entering an engineer's office to avail themselves, at once, of practical experience in the application of the knowledge they had acquired. They had here given to them a fair start in the study and practice of engineering as a science and an art, of practical knowledge and of scientific principles. It was sometimes said that to the engineer nothing was impossible, but they should rather say that nothing was impossible that was practicable, and to be practicable it must be in accordance with scientific principles. Theory and practice must go hand in

hand,—theory enlightening practice, and practice demonstrating the truth of theory. He impressed upon the students the necessity and importance of keen thoughtful observation, patience, hard work, promptitude in action, honesty and steadfastness of purpose. The successful, trustworthy engineer must also be a good man of business. He was sure that this School was doing an excellent work, and growing in favour more and more in the profession, because of its thoroughness. It had been said that the profession was overstocked; but it was not, he (the Chairman) felt certain, over-crowded with competent men, and those who thoroughly understood their work and were the masters of their profession would obtain employment, while others remained idle because they were ignorant of the main principles upon which good work should be based.

The Chairman then presented the certificates of merit. The lectures for the term were on "Railway and Dock Work." Thirty-two students attended the lectures, 22 were eligible for examination, and 18 passed satisfactorily. The highest number of marks attainable for lecture examination was 278. E. C. R. Nelson was first with 261 marks. Mr. Nelson seems entitled to be pronounced Dux of the School, his marks being the nearest to the highest possible ever yet attained. He was also first in order of merit among the students of the first term in the Civil Engineering section, for General Surveying and preparation of plans, sections, and estimates for Parliament. C. Carnmaru was second for Lecture Examination, with 288 marks, and first in order of merit for work in the pattern shop. For work in the Drawing Office 10 certificates were awarded: A. M. A. Struben first, P. B. Motley second. For work in the Pattern Shop 10 certificates, C. Carnmaru first, A. M. Templar second. For work in the Fitting Shop, 8 certificates, D. A. Andrus, first; E. B. Hall, second. In the Civil Engineering Section, first term, General Surveying, preparation of plans, sections, and estimates for Parliament, 13 certificates, Nelson (see *ante*) first, C. S. Angus, and N. B. Dickson equal seconds. Second term, calculations, plans, and estimates for a railway and dock, 4 certificates, J. S. Lea, first; D. A. Symonds, second. Third term, design and construction of existing or other engineering works, 7 certificates, H. P. Miles, first; E. Battersby, second. In the Electrical Section, theory and practice of electricity applied to electric lighting, 3 certificates were awarded, to A. P. Crawford, elementary, and to H. C. Belgemann and H. Riley in advanced sections. To students in the Colonial Section 5 certificates of the first grade were awarded.

Mr. R. H. Twigg and Mr. C. Wilson Moore (Examiners), Mr. Wilson (Principal), and other gentlemen, also addressed the students.

#### BRITISH ARCHEOLOGICAL ASSOCIATION

THE forty-fifth annual congress of this Association is, as we have already announced, to be held in Glasgow during the week commencing Monday, August 27. The President of the meeting will be the Marquis of Bute. We are informed that Her Majesty the Queen has been pleased to accept the patronage of the meeting. The Prince of Wales, as Duke of Rothesay and Baron Renfrew, has also accepted the office of Patron. The following is the programme of the proceedings:—

*Monday, August 27.*—Public reception by the Lord Provost of Glasgow, Sir James King, and the Civic Authorities, in the City Chambers, Ingram-street, at 11 A.M. After which the party will proceed by train from Queen-street Station to the site of the Battle of Langside, where the Lord Provost will unveil the statue which has been erected in commemoration of the battle, in presence of the party, and addresses will be delivered by Mr. J. Wylie Guild, F.S.A.Scot., and Mr. A. M. Scott, F.S.A.Scot., author of "The Battle of Langside." The members of the congress and others will then be entertained at luncheon, on the invitation of the Langside Memorial committee. The Pre-historic Hill fort will be examined. At 3.20 p.m., the Cathedral of Glasgow will be inspected, and its architectural features described by Mr. John Honeyman, F.R.I.B.A., F.S.A.Scot., President of the Glasgow Archaeological Society, and others. A public dinner will be held in the Merchants' Hall, at 7.45 for 8 p.m., in time for members who may arrive at Glasgow by the morning train from London.

*Tuesday, August 28.*—The party will proceed by the train leaving the Central Station at 9.20 to inspect the ruins of Bothwell Castle (the property of the Earl of Home), and the excavations now in progress. Afterwards a visit will be paid to the Church of Bothwell, which possesses a curious stone-roofed chancel. The members will then proceed by train to Hamilton to Craigmichael Castle, the residence of Sir Walter Scott, where, by invitation of Mr. M. Bullock, luncheon will be partaken of within the Castle grounds. Should time permit, a visit will be paid to



Lanark and the Falls of the Clyde. There will be an evening Meeting at 8 p.m. in the Merchants' Hall, when the Inaugural Address will be delivered by the Marquis of Bute, and papers will be read.

**Wednesday, August 29.**—Members and their friends will proceed by the 9.20 train to Tarbert, where carriages will be ready to convey them to inspect Tarwood Castle and Tappie Broch, both of which will be described by Mr. J. Dalrymple Duncan, F.S.A. Scot. Carriages will be resumed, and, passing over the site of the Battle of Bannockburn, a visit will be paid to Strirling, where the celebrated Castle, the Church, Argyle's Lodgings, Mac's Work, the Guildhall, Queen Mary's Palace, and various other antiquities will be examined, under the guidance of Mr. W. B. Cook. Luncheon will be partaken of, and, should time permit, the Tower of Cambuskenneth Abbey will be visited. Return to Glasgow by train, in time for evening meeting at 8 p.m. for the reading of papers in the Corporation Galleries.

**Thursday, August 30.** The party will proceed by steamer from Broomielaw down the Clyde to Rothesay, passing the ancient castles of Dumbarton and Newark, and the site of the termination of the Antonine Wall. On arrival at Rothesay, the ruins of Rothesay Castle will be inspected and described by the Reverend J. K. Hewison, M.A., F.S.A. Scot., Mr. E. P. Loftus Brock, F.R.I.B.A., F.S.A., and others. Under Mr. Hewison's guidance, the ruined chapel adjoining St. Mary's Church, the burial-place of the Royal Stuarts, descendants of the Earls of Bute, will be inspected and described, the architectural features being pointed out by Mr. John Honeyman. Carriages will then be in readiness to convey the members to the standing Stones of Lohans, the Vindicta Fort of Dunagill, which will be described by Mr. Honeyman and others; after which the ancient Chapel of St. Blaine's will be visited and described. These progress will be made to Mount Stuart, where the party will be entertained at luncheon, on the invitation of the Marquis of Bute, President, who will describe the antiquities and curiosities laid open for inspection. Carriages will be resumed to Rothesay, where the party will be conveyed back to Glasgow. Owing to the length of the journey there will be no evening meeting.

**Friday, August 31.**—Members and their friends will proceed by train at 10 o'clock from the Central Station to Paisley, where the nave of the ancient Abbey, its adjoining chapel, and traces of the monastic buildings will be inspected. After a short notice of the history, the architectural features will be pointed out by Mr. Loftus Brock and others. The party will then proceed by train to Glasgow, and inspect carriages to inspect the collection of Scottish antiquities in the model of the ancient castle of the Bishops and Archbishops of Glasgow, in the Exhibition grounds. Luncheon will be partaken of in one of the Exhibition pavilions, after which the Hunterian Museum in the University will be inspected, under the guidance of Professor Young, M.D., Curator. There will be an evening meeting in the Corporation Galleries at 8 p.m. for the reading of papers.

**Saturday, September 1.**—The party will proceed by train from Broomielaw-street Station at 9.15 to Doune, where the ancient Castle, belonging to the Earl of Moray, will be inspected, and described by Mr. D. Duncan. The Roman Camp at Ardoch will then be visited and described, after which progress will be made to Lanark to inspect the ancient Cathedral, under the guidance of the Rev. A. Ritchie and others. Owing to the length of the excursion, there will be no evening meeting.

**On Sunday, September 2,** a Sermon will be preached in the Cathedral at Glasgow by the Reverend G. Stewart Burns, D.D.

**Monday, September 3.**—The party will proceed by train to Bonyhilly Station to inspect the Antonine Wall and the almost perfect fort, Rough Castle, one of the Roman forts on the line of the wall. Then, on foot to Falkirk, and by train to Linlithgow for the ancient Palace and the Church, both of which will be described by Mr. Duncan and others. Return by train from Linlithgow Station in time for the closing meeting at 8 p.m., which will be held in the Corporation Galleries, and where any remaining papers will be read.

The following are among the papers already promised for the Congress:—Mr. John Honeyman, F.R.I.B.A., on "The Architecture of Glasgow Cathedral"; Archbishop Eyre, on "The History of the See of Glasgow"; the Rev. J. K. Hewison, on "The Chapel of St. Blaine"; Mr. W. G. Black, F.S.A. Scot., on "The Derivation of the Name Glasgow"; Dr. Collingwood Bruce, F.S.A., on "The Wall of Hadrian"; Mr. W. Jolly, H.M. Inspector of Schools, on "The Wall of Antoninus"; Mr. A. M. Scott, F.S.A. Scot., on "The Battle of Langside"; Professor Young, M.D., on "The Collections of the Hunterian Museum"; Dr. Phené, F.S.A., F.R.G.S., (1) "On Further Discoveries of Mounds in the Form of Animals in the various parts of the World," (2) "On the Similarity of Objects found," &c.; Mr. Thomas Morgan, F.S.A., "Notes on Scottish History"; Mr. W. de Gray Birch, F.S.A., on "Materials for a Scottish Monarchy"; Mr. E. P. Loftus Brock, F.S.A., on "The Peculiarities of Ancient Scottish Architecture"; Mr. George R. Wright, F.S.A., on "Extracts from a MS. Diary of the Duke of York, on his Journey from London to Edinburgh, 1672."

Papers are also promised from Professor Ferguson, LL.D.; Mr. E. Maunde Thompson, F.S.A., Principal Librarian, British Museum; Mr. J. O. Mitchell, Mr. D. Duncan, Mr. J. Dalrymple Duncan, F.S.A. Scot.; Professor Hayter Lewis F.S.A.; Mr. J. Romilly Allen, F.S.A. Scot., and several other gentlemen.

**Drighlington.**—A memorial stained-glass window has been placed in Drighlington Church, Yorks, illustrating the Acts of Mercy. It has been designed and executed by Messrs. Powell Bros., of Leeds.

### "SHORT" QUANTITIES.

SIR,—With reference to your article [p. 75, ante] on "Short" Quantities, will you allow me to point out that the decision of the Court of Appeal in *Priestley v. Stone* was a necessary result of the practice at present adopted by the building trade, and that builders can easily make the quantity surveyor liable by insisting upon having an express guarantee or undertaking that the quantities are accurate. Under the present system, the quantity surveyor does not, in fact, make any contract with the builder that he will use due care and skill. He is not, in fact, retained or employed by the builder before he takes out the quantities. He does not, in fact, make any express statement or representation to the builder that his quantities are correct; and he does not enter into any undertaking or guarantee that they are correct.

If a builder wishes to make the quantity surveyor liable to him, he should insist upon an undertaking being signed by the surveyor, and inserted at the foot of the copy of the quantities handed to him. The undertaking might be in some such terms as these:—"In the event of your tender for the above-mentioned work being accepted, I hereby (in consideration of your paying me £1 per cent. on the amount of your tender, and £1 for lithography) undertake and guarantee that the above quantities correctly state the amount of work and materials necessary for the completion of the said work in accordance with the plans and specification signed by the architect, and in case the said quantities are found to be deficient, I agree to pay you the value of the work and materials omitted."

Of course, I can understand that in many cases the quantity surveyor might refuse to sign any such undertaking. The builder can then either refuse to tender, or can have the quantities tested for himself, or can rely on the reputation of the quantity surveyor for careful work. On the other hand, if the surveyor does sign an undertaking, both he and the builder will know their exact legal position.

There is one other course open to the builder—he can insist upon the quantities being made the basis of his contract with the building owner. This course was recommended by Mr. Justice Stephen, in his judgment in *Priestley v. Stone*, and on the strength of that judgment a builder (in a case in which I was recently engaged) obtained a large sum from the building owner beyond the contract price, because the quantities were deficient.

ARTHUR H. SPOKES.

SIR,—The case as to short quantities which you criticise in your number of August 4th is so important to the building world that I may perhaps be allowed to point out what seemed to me some fallacies in your comments [p. 75, ante]. At the beginning of your criticisms (third col.) you take the Master of the Rolls to task for saying that there was no precedent for an action by a builder against a quantity surveyor, and you quote the case of "Scargill v. Shoppee," from Mr. B. Fletcher's work, as an instance to the contrary; but you also state that this was an action by a *building owner* against a quantity surveyor. There is, therefore, absolutely no analogy between the two cases, and it is, if I may say so, absurd to say, as you do, "that in logic, if not in law, if they [surveyors] could be sued by one party to the contract for excessive quantities, they could be sued by the other party for deficient quantities," because there is a direct contract between the building owner and the quantity surveyor, made by the architect, the authorised agent of the former, and of course one party to a contract can sue another for a breach of it. Therefore the case of "Scargill v. Shoppee" is quite irrelevant to the case under discussion. You then quote the belief of two capable architectural text writers, but, of course, the opinion of any single individual, though it be expressed in print, has no special weight in a matter of this kind. Practically, then, the gist of your quarrel with the decision of the Court of Appeal is in the assertion of the judges, that the quantities do not amount to a representation that they are true in fact. Of course, you allude to an implied representation, not to a direct one, and, on all hands, it is admitted that there is nothing more uncertain than the doctrine of implied representation, because the mind of one person will often imply a representation which to the mind of another appears quite untenable; but I maintain that any one looking at this question unfettered by the professional ideas of an architect or a lawyer, would say that all that the quantity surveyor implies by his bill of quantities is that he has taken reasonable care to make them accurate, and that he has brought

competent skill to the task; an implied representation that the bills are correct, in fact, is the same as the guarantee that they are so, and no professional man can possibly guarantee that his work is altogether free from mistakes. An architect does not represent that his plans are absolutely correct, only that he has taken reasonable care, and is a competent man. It is the same with the physician: he does not guarantee that his prescription is absolutely right, he only represents that he has brought care and skill to the work. How, then, can a greater responsibility fairly be put on a quantity surveyor than on any other professional man? Again, why should the builder be in a better position than a man who makes use of the services of any other professional man than a quantity surveyor; assuming that, by custom, he could sue the latter for short quantities, it could only be on the ground of negligence, or of being quite incapable of performing his duties. The practical result of your contention would be to place the builder in this position,—one more favourable than is occupied by any one else engaged in business,—viz., that the builder could obtain for his guidance quantities for which he would not, viz., the building owner, ultimately pays and is primarily liable for, and that though the builder does not pay for them, he is to have an absolute guarantee for their correctness,—a position which, to an unprofessional mind, is absurd.

August 6, 1888.

A BARRISTER.

SIR,—No doubt considerable interest has been excited among the architectural profession and building trade generally in the case of "*Priestley and Gurney v. Stone*," which was tried in the early part of this year before Mr. Justice Stephen, and concerning which some correspondence appeared in your columns on the 21st and 25th of January last. I have read with care the report of the "appeal" in the *Times* newspaper of the 31st ult., and also your very excellent article on the subject in the *Builder* of the 4th inst.

The result of the original trial and the confirmation of the decision by the Court of Appeal appeared to be as unsatisfactory as it is possible to imagine, both in regard to the architectural profession and the building trade, and if upheld will influence in a very detrimental way the well-recognised understanding hitherto existing between building-owners, architects, and builders.

It is unquestionably desirable, and indeed essential, in the case of large contracts, that the "quantities" should be supplied, as by such means contractors are all placed at the outset upon a uniform basis, from which they are enabled to make their calculations and to prepare their tenders; and I am satisfied that when "quantity surveyors" of good standing are employed, the bills of quantities are generally prepared with great accuracy, and with due regard to the interests of the building owner and the builder respectively; it cannot, however, be too strongly impressed upon architects to prepare their drawings and specifications in the first instance in such a manner as not to admit of any conflicting or double meaning.

It is all-important that the initial proceedings in regard to the planning of buildings and the preparation of specifications and bills of quantities should be correct and explicit, and in the interest of all parties concerned it is very desirable that provision should be made for the reference to a *professional arbitrator* of any matter that may arise in dispute, as by this means a legal quibble and unstable and costly decision would be avoided, for it is evident that few of our judges are well versed in the intricate details and technicalities of specifications and bills of quantities.

I would suggest the advisability of inserting in specifications some such clause as the following, viz., "Tenders are invited in accordance with the accompanying drawings, and subject to the terms and provisions of this specification and of the bills of quantities supplied herewith; and prior to the signing of the contract, the contractor whose tender may be accepted will be required to satisfy himself as to the correctness of the said quantities and certify accordingly." If any errors were discovered they could be adjusted between the architect and contractor: the builder whose tender was likely to be accepted would not object to the slight trouble or expense of checking the correctness of the principal items, and when once admitted no further question could arise as to the accuracy of the quantities, and no misunderstanding of the nature under consideration would be avoided.

HENRY D. HUMPHRIES.

Cheltenham, Aug. 6, 1888.

**Erratum.**—A correspondent points out that an awkward group appears in our issue of last week in the Wallace statue, Aberdeen. There was stated to have been "carried out" the aid of a bequest of 3,000*l.* left for the purpose by the late Sir John Steel, the sculptor, Edinburgh. Sir John Steel, we are glad to learn, is still alive, and lately was awarded a pension of 100*l.* per annum for his services as sculptor. The bequest was left by the late Sir John Steel, of Grange-road, Edinburgh. We very much regret the mistake.

\* We did nothing of the kind.—Ed.



# The Student's Column.

## ARTIFICIAL STONES.—VII.

ones formed from Plaster of Paris (continued).

**MILE DE LARQUE'S** patented artificial marbles were composed of plaster of Paris and alum mixed with pure ter or gum-water. The mixture was carefully treated by the application of sections or bars of coloured plaster, and the cast was strengthened with canvas backing, especially if made into slabs or panels. The veins were produced by drawing coloured threads of silk through the mixture. The moulds may be polished or rough, according to the surface-effect desired.

In 1876 Guelton & Sandeman patented a process in which artificial marble was made from cement on glass moulds, the veins, &c., being imitated with webs, nets, &c., of coloured paper. The slabs were backed with hemp or similar material, and soaked in a solution of phosphate to render them waterproof.

In the formation of another patent artificial marble, the plaster of Paris is mixed with a solution containing tungstate of soda, tartaric acid, bicarbonate of soda, and tartrate of potash, to produce the veined effect, hairs are dipped in the required colour, and laid on the surfaces of the slab or mould on or in which the plaster is to be placed, and, before the plaster sets, drawn carefully through it so that they part with air colour.

Another inventor suggests the use of what is known as "Martin's cement," a compound made in a similar way to "Keene's cement," by which the carbonates of potash or soda are employed in addition to the alum, and the setting of the mixture takes place at a higher temperature.

The so-called "Muro" marble was directed to be made from either "Keene's" or "Martin's" cement, or a mixture of the two, made into a paste with a solution of sulphate of iron and a little nitric acid in water. The mass produced are, when dry, treated with tarnish stored at a temperature between 10° F. and 300° F. for twelve or twenty-four hours, and when cooled, rubbed smooth with fine-stones, coloured, varnished, japanned, &c., as required.

Another marble-like artificial stone is said to be obtainable by the use of a mixture containing ten parts of Keene's cement, one part of sand glass, and half a part of alum or salt dissolved in hot water.

"Pick's" "Neoplastic," patented in 1883, consists about 75 per cent. of plaster of Paris, mixed with marl, felspar, and either coke dust or any matter containing iron. If mixed with pumice-stone and suitable colours, it forms substance resembling marble.

In 1882 Guelton patented the use of a cement formed of alabaster and alum. To produce crystallised surface on stones containing this cement, alum solution was to be sprayed on while they were setting.

"Pelee's" "Imitative Stones" were composed of a mixture of ten pounds of rosin, twenty pounds of plaster of Paris, four pounds of coke dust, and ten pounds of fine sand, melted together. Large blocks might be economically made by filling the centre with flints or other waste material.

"White asphalt" is a somewhat similar material to the foregoing, being made up of ten pounds of rosin melted with twenty pounds of plaster of Paris and ten pounds of pulverised tar. These ingredients having been thoroughly incorporated, two pounds of rosin oil are to be added in.

"Maretzo" marble is formed from plaster of Paris cast in polished moulds, and veined with coloured moistened fibres of silk, which may be set on frames and drawn through the mixture. Patent obtained in 1884 varies the mode of obtaining the veining, and is applicable to other materials besides plaster of Paris. Fine ly, plaster, or cement is run or rolled out into sheets or slabs, allowed to dry atmospherically until it cracks or breaks into pieces. If necessary, the cracking may be facilitated by gentle tapping. Into the cracks or spaces formed a coloured slip of clay, plaster, or similar materials is run in and allowed to harden.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

12,197, Fireproof Construction. J. B. Petter.

This invention consists in the arrangement of one or more shafts or chimneys immediately over and leading from the top of a stage or platform, which may be mechanically or automatically opened by the action of heat on melting material, or in other ways. The products of combustion in case of fire are carried off through shafts, and the passages for the audience are utilised for the ingress of fresh air to be drawn towards the shaft, avoiding the danger of asphyxiation for the audience.

12,291, Automatic Door Closer and Check. W. Fraser.

The closer which is the subject of this invention acts by a spring, which actuates a piston in a receptacle filled with oil. The travelling of the piston through the oil contained in a cylinder affords an effective check. The details of construction are specially adapted to this form of closer.

7,617, Improvements in Unions for Lead-pipes. J. Barsdley.

According to this invention, the union or coupling for joining lead-pipes is made in two parts instead of three, as heretofore. Solder or leather is also dispensed with. The male socket is constructed a little longer than usual, and the front part is bevelled or turned to an angle corresponding to that of the flange. This socket has an external screw to fit into the internal screw of the female socket. At the end of the female socket is a hole sufficiently large to receive the lead-pipe to be joined. After the pipe has been tamped at the end, by screwing up the socket so as to press the bevelled or turned front against the inner end of the lead-pipe resting on the flange of the female socket, a perfect joint is made.

8,011, Draught-proof Reversible Window. W. W. Clayton.

The object of this invention is to dispense with sash-cords and weights, and, at the same time, render the window perfectly draught-proof. A "rack-and-pinion" movement is used to open and close the sashes, which may be turned inside for cleaning, glazing, &c.; or may, if desired, be entirely lifted out of the frame. Each sash requires two racks, one for each side, and the pinion or cogged wheel is worked by a key, one key working all the racks.

8,385, Ventilating Apparatus. J. McConachy.

This invention refers to an apparatus designed to present a slightly appearance, both externally and internally, allowing air to pass through while it prevents the passage of rain. The chief feature is the arrangement of louvers on a ventilating panel, which is made grammical as well as airtight. A ventilating-shaft, divided by radial partitions, conducts the air currents to and from the apartment.

### NEW APPLICATIONS FOR PATENTS.

Aug. 3.—11,238, S. Edmonds and W. Timbrell, Catches or Fasteners for Doors, Gates, &c.—11,242, E. Darley, Panic Bolt for Doors of Theatres, &c.—11,249, W. Ross, jun., Syphon Drain-pipes.—11,250, T. Dowd, Window and Rising Latch Fastenings.—11,260, R. Stephens, Sash Fasteners.—11,263, F. Hemmings, Planning of Terrace Houses.—11,271, C. Kinneil and G. Robnie, Balancing and Opening Sashes, Casements, or Ventilators.—11,275, R. G. and E. Restall, Stoves.—11,279, J. Fejer, Grate or Trellis for Windows.

Aug. 4.—11,290, E. Poole, Roofing Tiles.—11,306, W. Howard, Window Fastenings.—11,327, G. Sutherland, Combined Latch and Lock.

Aug. 7.—11,362, A. Ostins, Self-closing Window.—11,398, P. Brentini, Paint-removing Compound.

Aug. 8.—11,427, J. Millar, Underground Urinals, Water-closets, &c.—11,429, J. Parkinson and Others, Rules, T-squares, Levels, and Set-squares.—11,433, J. Jackson, Radiators for Warming and Ventilating Buildings.—11,460, C. Priestley and S. Gurney, Wood-block Flooring.—11,466, C. Southon, jun., Chimney Cowl.

Aug. 9.—11,483, H. Planner, Disinfecting Apparatus for Water-closets.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

8,070, J. Morrell, Dust-bins.—8,829, J. Calder, Water-closet Cisterns, &c.—9,574, Enamott & Co., Tower Bolts.—9,630, M. Cockburn, Stoves and Cookstoves.—10,068, C. Darrah, Ventilators.—10,081, A. Boul, Imitation of Wood Graining.—10,450, W. Harte, Window Fastenings.—10,501, B. Jones, Tipping Carts.—10,532, F. Genth, Water-closets.—10,544, F. Winsor, Flushing Tanks or Cisterns.—10,563, F. Royce, Electric Bells.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

11,237, H. Noble and G. Haley, Hearths of Fireplaces, Fenders and Dadoes of Metal and Enamel.—13,537, T. Fawcett, Brickmaking and Drying Machinery.—13,680, J. Seaton, Construction of Roofs.—13,976, W. Moors, Preventing the Bursting of Water-pipes by frost.—2,576, A. Boul, Burglar Alarms.—4,518, J. Marston, Opening and Closing Fanlights, Skylights, &c.—7,239, E. Baller, Auto-

matic Locking Bolt.—7,289, W. Allan, Construction of Pipes.—9,733, E. Emanuel, Double Fan for Wash-out Closets.—9,856, B. Munster, Window Sashes and Sash Frames.—10,040, C. Rogers, Wood Screws.

## RECENT SALES OF PROPERTY.

### ESTATE EXCHANGE REPORT.

AUG. 3.

By DRIVER & CO.

Warwickshire—The Berkswell Hall estate—Berkswell Hall, and 1,914a. 3r. 12p.; and the Manor ..... 420,000  
Numerous cottages and plots of land ..... 3,665  
Sunnyside Farm, containing 22a. 0r. 22p., freehold ..... 1,750  
Marsh Farm, containing 61a. 2r. 26p., freehold ..... 4,000

AUG. 7.

By DEBENHAM, TEBSON, & CO.

Caterham The residence called Woodlands, and 8½ acres, freehold ..... 4,000  
South Kensington—12, Wallgrave-terrace, 70 years, ground-rent £5 ..... 405  
Dorset-square, Park-street—Ground-rents of £34, 13s., term 11 years ..... 300

By FARRERBROTHER, ELLIS, & CO.

Waybridge—The residence known as Petersham Place, 2a. 2r., freehold ..... 2,360  
Covent Garden—10, Maiden-lane, freehold ..... 2,350

AUGUST 8.

By ST. QUENTIN & SON.

Brentwood—1 and 2, Western Villas, freehold ..... 1,580

By HERRING, SON, & DAW.

New Southgate 13 and 14, Railway-terrace, 0, freehold ..... 1,750

By SALZEN, RAY, & CO.

Lincoln's Inn—14, Little Wild-street, and 15, Wild-court, freehold ..... 1,440

AUGUST 9.

By NEWBORN & HARDING.

Clapham—132, Larkhall-lane, and improved ground-rents of £21, 0s., 26 years, ground-rent £21, 10s. Pentonville—5, Cumberland-terrace, 29 years, ground-rent £13 ..... 750

Gravesend—1, The Grove, freehold ..... 500  
Brixton—7, Moral-road, 91 years, ground-rent £7, 20s. .... 350

By C. C. & T. MOORE.

Old Ford—76, Hewlett-road, freehold ..... 385  
Buckhurst Hill—9 and 10, Bridge-terrace, 94 years, ground-rent £3 ..... 200  
Victoria Park 344, Old Ford-road, 65 years, ground-rent £10 ..... 350

By GEO. GOULDSMITH, SON, & CO.

Belgravia—9, Upper Belgrave-street, 36 years, ground-rent £52 10s. .... 5,300  
Chelsea—Ground-rents of £3, reversion in 84 years. Ground-rents of £3, reversion in 84 years. .... 90  
43 to 49 odd, Milman's-street, freehold ..... 1,620  
Ten freehold cottages in Ann's-place ..... 1,810

By WILKINSON & SON (at Brighton).

Lindfield—Goddard's Farm, and 56a. 2r. 13p., freehold ..... 1,340  
Brighton—10, Montpelier-crescent, freehold ..... 875  
Hove—47, Denmark-villas, freehold ..... 940

AUGUST 10.

By G. A. WILKINSON.

Forest Hill—6 to 9, Wynell-road, 75 years, ground-rent £28 ..... 785  
11 to 15, Wynell-road, 75 years, ground-rent £35. .... 680

By BAKER & SONS.

Tottenham—The Wenlock Brewery Stores, 88 years, ground-rent £30 ..... 750  
Newington Causeway—No. 87, freehold, area 1,740 ft. .... 1,300

Brixton—115, Loughborough-road, 154 years, ground-rent £5 ..... 345

## Miscellaneous.

**Board Schools, West Hartlepool.**—At the monthly meeting of the West Hartlepool School Board, held on the 7th inst., Mr. Thomas S. Hudson presiding, a committee brought up a report recommending that, subject to the conditions of instruction being complied with, Mr. G. G. Hoskins' (Darlington) plans for No. 1 School, to be situated in Young and Derwent-street (north-west of the town) and to accommodate 360 boys, 310 girls, and 380 infants, and Mr. Pritchett's (Darlington) plans for No. 2 School, to be situated in Oxford-street, to accommodate 350 mixed scholars, 270 infants, and 300 girls, be accepted. After discussion, a practically unanimous assent was given to the adoption of Mr. Hoskins' plans. It was subsequently resolved that Mr. Pritchett's plans for the Oxford-street schools be accepted.

**Surveyorships.**—At a special meeting of the Oswestry Town Council on Saturday last, Mr. James Bolton, Assistant Surveyor of Wigan, was appointed Borough Surveyor of Oswestry, at a salary of 200l. in succession to Mr. H. T. Wakeham, C.E., who has been appointed Surveyor of the Garston district, Liverpool. There were 126 candidates. At a meeting of the Dewsbury Town Council on the 9th inst., it was resolved to increase the salary of the Borough Surveyor from 250l. to 300l. per annum.



### A New Building Estate at Wimbledon.

—On Monday last Messrs. Baker & Sons offered for sale, at the Prince of Wales' Hotel, Wimbledon, 135 plots of freehold building land on the Southdown estate, which is situated about ten minutes' from the Wimbledon Station of the London and South-Western Railway, and the new station about to be erected in connexion with the new line now in course of construction to join the Metropolitan District Railway at Putney. The estate is about 20 acres in extent, on which five new roads have been constructed for the erection of about 300 houses and shops. It was stated that the roads on the estate are supplied with a duplicate system of drainage, and that connexion could be made from the sewers from each lot. It was added that the mains of the Lambeth Waterworks Company had been laid down in all the roads, and now supplied the estate. Most of the plots offered have frontages of 18 ft., and depths [varying from 70 ft. to 90 ft., and they were described as suitable for the erection of medium-sized villas; whilst several other plots, facing a wide main road from Wimbledon to Raynes Park, are much larger, having frontages of 39 ft., and depths of from 110 ft. to 125 ft. The auctioneer, in submitting the property, said it was ready for building operations being at once commenced, well-made roads and drainage having been completed, together with an ample water-supply. The large plots, of 39 ft. frontage, were first submitted, and for these 190l. each was the highest sum offered, on which the auctioneer observed that 200l. was the reserve, and any offer above that sum would purchase them. No further bids being made they were withdrawn. The smaller plots, having frontages of 18 ft., were next submitted, when several were sold at prices averaging 40l. each.

### The German Houses of Parliament.

The building destined to be the future home of the German Reichstag will be a remarkable edifice. The brickwork is now completed as far as the roof, but the facing, both inside and out, is still in course of erection. The sandstone blocks used for the facing are by themselves thicker than the walls of many, even the largest houses, some of them weighing as much as 4 tons. The stone used will be, like the assembly which is to deliberate in its halls, of a thoroughly representative character. There will be sandstone from Silesia, broken from the quarries of Alt-Warthau, near Buzlau, and of Rackwitz, near Löwenberg; Bavaria will be represented by Lower Franconian stone from Burgreppach. In the Hanoverian portion of the Harz Mountains, blocks are being taken from the stone quarries of Nesselröden, near Osterode. The Teutoburger Wald, where Varus and his Roman legions perished, will supply stone from Berghelm, near Höster. Although the various quarries east and west are separated by long distances, they all furnish a uniform light grey material of the same colour, and of equal soundness. From the south-west of the German Empire the fine-grained darker stone will be sent, which is to be used for facing and adorning the inner halls and lobbies. Bayerfeld, on the Alsenz, in the Bavarian Palatinate on the Rhine, and Udelingen, near Trier, are supplying stone; and in order that the reconquered provinces should not be absent in the new building, the quarries of Arzweiler, near Saarburg, and of Pfalzburg, will furnish material from Lothringen.

**The English Iron Trade.**—The English iron trade looks very healthy. The slight weakness observable last week has entirely disappeared; the demand is well sustained, and the tone of the market is strong. Pig-iron is much firmer. At Glasgow warrants have been going up steadily, and an active business has been done; they have now reached 40s. a ton. Scotch makers' iron is from 6d. to 1s. a ton higher. Middlesbrough pig has quite recovered from its recent relapse, and is now quoted 33s. 3d. prompt, while 33s. 6d. is refused by makers. With a moderate enquiry for pig-iron in Lancashire, the recent advance has become well established. In Staffordshire crude metal is stiff. The hematite pig-iron trade is very steady, and in the north-west mixed numbers of Bessemer are quoted 44s. a ton, an advance of 6d. on the week. A very hopeful feeling prevails in the finished iron trade, and advances in price are reported. Although there is an abundance of orders for steel, prices of rails do not improve. In the plate and shipbuilding material departments, however, there is a tendency towards better prices. The shipbuilding yards are busy, and there is a fair amount of activity amongst engineers.—*Iron.*

### The Victoria Hall and the South London Polytechnic Schools.

—The committee of the Victoria Hall having raised the sum of £17,000 for the purchase of the freehold of the building in Waterloo-road, for many years known as the Victoria Theatre, but more recently as the Victoria Hall, the building will now be utilised in connexion with the South London Polytechnic Schools, the property being handed over to the Commissioners of the Schools rent-free. The ballad concerts and variety entertainments which have been so popular there during the last few years will not, however, be interfered with under the new arrangement, the great hall itself being still retained for this class of entertainments; but at the back of the building, class-rooms are to be built for the use of the working men and others attending the Schools, and it is intended to make the Victoria the senior branch of the Polytechnic Schools in South London, the classes for technical instruction and the amusements in the hall being thus quite distinct. The Commissioners expect to raise an endowment fund of 30,000l. or more, about 6,000l. of which is intended to be expended in the erection of the class-rooms, and other alterations in the building connected with the work of technical instruction. It is said that in the negotiations for the purchase of the freehold the ground-landlord made a reduction of 4,000l. in the purchase-money, in consideration of the public utility of which the building is in future to be the centre.

### "Sweating" in the Paris Building Trades.

—According to an "Occasional Correspondent" of the *Times* (see that journal for Tuesday last), "*marchandage*," which, in technical parlance, corresponds with our term "sweating," largely prevails in the Paris building trades. Says the correspondent:—"The *marchandage*" differs from sweating, inasmuch as in France it is considered to apply more especially to the building trades; hence the great importance of its abolition by the Paris Municipal Council. Sweating in the building trades, especially among the plasterers, exists also in England, but apparently not to the same extent as in France. Builders in Paris make any number of small contracts for various portions of a structure. The sub-contractor, tastermaker, or "*tâcheron*," engages more or less unskilled and inferior workmen to help him, and pays wages low enough to admit of his making a good profit. Thus the work is badly done, the workmen, often Belgians or Germans, badly paid, while the skilled French workers stand out in the cold starving for want of employment. To this may be attributed much of the present dissatisfaction and the general outcry against the importation of foreign labour, which in Paris is a far more serious grievance than in London. The proportion of foreigners who compete and reduce the rate of wages is much greater in Paris, and in France generally, than in England."

### Great Enlargement of the Midland Railway Company's Works at Derby.

The Midland Railway Company are about to make a very extensive enlargement of their engine and carriage works at Derby, which already cover the large area of more than 200 acres. For the purposes of the extension the Company have purchased, from the trustees of the late Sir George Wilmot, and the present baronet, Sir Robert Wilmot, the property known as the Osmaston Park Estate at Derby, which is situated adjacent to the Company's existing works. The land purchased extends over an area of 235 acres, and includes Osmaston Hall, the ancestral home of the Wilmots, a fine old mansion, erected in the year 1696, which will now be shortly demolished. When the additional works now about to be constructed are completed, the Midland Company's locomotive and carriage manufacturing establishment will cover an area of between 450 and 500 acres, being the largest railway works of its kind in England, with the exception of those of the London and North-Western Company at Crewe.

### PRICES CURRENT OF MATERIALS.

| TIMBER.                      | £. s. d. | £. s. d. |
|------------------------------|----------|----------|
| Tack, U.S. .... load         | 8 0 0    | 12 10 0  |
| Sequoia, E.I. .... foot cube | 0 2 3    | 0 3 0    |
| Birch, Canada .... load      | 4 0 0    | 4 15 0   |
| Pir, Danzig, &c. .... load   | 2 0 0    | 4 0 0    |
| Oak .....                    | 2 0 0    | 4 10 0   |
| Canada .....                 | 4 0 0    | 6 10 0   |
| Pine, Canada red .....       | 3 10 0   | 3 10 0   |
| Lath, Danzig .....           | 3 10 0   | 5 0 0    |
| St. Petersburg .....         | 5 0 0    | 8 0 0    |

### TIMBER (continued).

| £. s. d.                                           | £. s. d. |
|----------------------------------------------------|----------|
| Waincoat, Odessa, crown .....                      | 2 10 0   |
| Deals, Finland, 2nd and 1st .....                  | 8 10 0   |
| Riga " 4th and 3rd .....                           | 6 10 0   |
| St. Petersburg, 1st yellow .....                   | 9 10 0   |
| " 2nd " .....                                      | 8 0 0    |
| " white .....                                      | 7 10 0   |
| Sweden .....                                       | 8 10 0   |
| White Sea .....                                    | 9 10 0   |
| Canada, Pine, 1st .....                            | 15 0 0   |
| " 2nd .....                                        | 9 10 0   |
| " Spruce, 1st .....                                | 8 10 0   |
| " 3rd and 2nd .....                                | 6 0 0    |
| New Brunswick, &c. ....                            | 5 10 0   |
| Battens, all kinds .....                           | 4 10 0   |
| Flooring Boards, sq., 1 in., prepared, First ..... | 0 7 0    |
| Second .....                                       | 0 6 0    |
| Other qualities .....                              | 0 3 0    |
| Cedar, Cuba .....                                  | 0 3 0    |
| Honduras, &c. ....                                 | 0 3 0    |
| Australia .....                                    | 0 4 0    |
| Mahogany, Cuba .....                               | 0 4 0    |
| St. Domingo, cargo average .....                   | 0 4 0    |
| Mexican .....                                      | 0 4 0    |
| Tobacco .....                                      | 0 4 0    |
| Honduras .....                                     | 0 4 0    |
| Box, Turkey .....                                  | 5 0 0    |
| Walnut, Italian .....                              | 0 4 0    |

### RETAILS.

|                                 |         |         |
|---------------------------------|---------|---------|
| Iron—Bar, Welsh London ton      | 4 17 6  | 5 0 0   |
| " " works in Wales ..           | 4 7 6   | 4 10 0  |
| " " Staffordshire, in London .. | 5 5 0   | 8 15 0  |
| British, cake and ingot ..      | 75 0 0  | 76 0 0  |
| Best selected .....             | 75 10 0 | 76 0 0  |
| Sheets, strong .....            | 80 0 0  | 81 0 0  |
| Chill, London .....             | 81 0 0  | 81 0 0  |
| Yellow Metal .....              | 0 7 6   | 0 7 6   |
| Lead .....                      | 13 17 6 | 0 0 0   |
| Pig, Spanish .....              | 13 5 0  | 0 0 0   |
| Sheet, English .....            | 14 2 6  | 14 7 6  |
| Strips .....                    | 17 2 6  | 17 2 6  |
| Ordinary brands .....           | 17 2 6  | 17 2 6  |
| Tin .....                       | 83 0 0  | 0 0 0   |
| Straits .....                   | 83 0 0  | 0 0 0   |
| Australian .....                | 83 0 0  | 0 0 0   |
| English ingots .....            | 95 0 0  | 0 0 0   |
| Zinc .....                      | 18 10 0 | 19 10 0 |
| English sheet .....             | 18 10 0 | 19 10 0 |

### OILS.

|                           |         |         |
|---------------------------|---------|---------|
| Lined .....               | 19 7 6  | 19 12 6 |
| Cocunut, Cochin .....     | 24 10 0 | 27 0 0  |
| Ceylon .....              | 22 5 0  | 0 0 0   |
| Palm, Lag .....           | 20 0 0  | 20 10 0 |
| Rapeseed, English pale .. | 24 5 0  | 0 0 0   |
| Cottolseed, refined ..... | 20 15 0 | 0 0 0   |
| Tallow and Oleine .....   | 25 0 0  | 45 0 0  |
| Lubricating, U.S. ....    | 4 0 0   | 8 0 0   |
| refined .....             | 7 0 0   | 12 0 0  |
| Terpentine .....          | 1 8 0   | 1 8 3   |
| American, in casks .....  | 0 16 0  | 0 16 6  |
| Stockholm .....           | 0 10 0  | 0 10 6  |
| Archangel .....           | 0 10 0  | 0 10 6  |

### TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**ACTON.**—For forming and making-up new roads at Acton, W., to be called Grafton-road, Balmain-carriels, and continuation of Goldsmith-road. Mr. Edward Monson, jun., architect and surveyor, The Vale, Acton.

| A.                                                                 | B.     | Total.     |
|--------------------------------------------------------------------|--------|------------|
| J. Ball, Chiswick .....                                            | £3,395 | £1,117 0 0 |
| G. S. Cost, Hammer-smith ..                                        | 3,216  | 1,041 0 0  |
| Rosland Bros., Fenny Stratford ..                                  | 3,154  | 1,050 3 8  |
| Nowell & Robson, Kensington ..                                     | 3,045  | 958 0 0    |
| G. Osenton, West-cham .....                                        | 2,992  | 977 0 0    |
| Neave & Son, Paddington .....                                      | 2,777  | 861 0 0    |
| J. Puzey, Hornsey .....                                            | 2,744  | 888 0 0    |
| G. Allred, New Bridge .....                                        | 2,695  | 868 0 0    |
| T. Hall, Rugby .....                                               | 2,643  | 834 0 0    |
| "A. Grafton-road and Baldwin-gardens. B. Goldsmith-road. Accepted. |        |            |

**BALHAM.**—For sanitary alterations and repairs at "Rutleigh," Balham. Mr. R. W. Price, architect, 12, Buckingham-street, Strand.

|                                       |      |      |
|---------------------------------------|------|------|
| T. Potterton, Balham (accepted) ..... | £782 | 15 0 |
| T. Potterton (accepted) .....         | 141  | 10 0 |

**BALHAM.**—For decorative repairs at 18 and 20, Ramden-road, and 2 and 6, Shipka-road, Balham. Mr. William Woodward, architect, Duke-street, Adelphi.

|                               |      |      |
|-------------------------------|------|------|
| T. Potterton (accepted) ..... | £275 | 12 4 |
|-------------------------------|------|------|

[Five completed.]

**BALHAM.**—For pointing down fronts, painting, and general repairs to several cottages, also for finishing and putting in fronts to several shops, Zenner-road, Balham, for Mr. Chas. Blake.

|                                      |      |     |
|--------------------------------------|------|-----|
| W. Lang, Grove-road (accepted) ..... | £355 | 9 0 |
|--------------------------------------|------|-----|

[No competition.]

**BLACKBURN.**—For the internal painting at the Black-burn and Lancashire Infirmary. Messrs. Simpson & Duckworth, architects, Richmond-chambers, Black-burn.

|                                                             |      |      |
|-------------------------------------------------------------|------|------|
| W. H. Cunliffe .....                                        | £235 | 0 0  |
| Henry Pickup .....                                          | 3 9  | 19 4 |
| R. T. Duerden .....                                         | 387  | 18 0 |
| John Leaver & Son .....                                     | 377  | 10 0 |
| George Tostell .....                                        | 366  | 11 0 |
| Saml Whittaker .....                                        | 359  | 4 8  |
| Christopher Dixon, Muncing-lane, Blackburn (accepted) ..... | 255  | 15 6 |

[All of Blackburn.]



# COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## COMPETITION.

| Nature of Work.                    | By whom required.     | Premium.   | Designs to be delivered. | Page. |
|------------------------------------|-----------------------|------------|--------------------------|-------|
| Public Library, Reading-Rooms, &c. | Newton Heath Local Bd | Not stated | Not stated               | i.    |

## CONTRACTS.

| Nature of Work, or Materials.           | By whom required.       | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------|-------------------------|-----------------------------------|--------------------------|-------|
| Asphaltic Tar-Paving                    | Walthamstow Local Bd    | Official                          | August 20th              | ii.   |
| Re-laying-up Roads                      | do.                     | do.                               | do.                      | ii.   |
| Repairs to Old Block Walls at Infirmary | Rev. T. Theophilus      | James & Morgan                    | August 21st              | ix.   |
| Concrete Paving                         | Wandsworth & Union      | T. W. Aldwinckle                  | August 23rd              | ix.   |
| Repairs to Old Block Walls at Infirmary | Hornsey Local Board     | T. De Courcy Meade                | August 24th              | ix.   |
| Re-laying-up Roads                      | The Comm'ttee           | F. H. A. Hardcastle               | August 27th              | ix.   |
| Re-laying-up Roads                      | Com. of H. M. Works     | Official                          | August 28th              | ii.   |
| Re-laying-up Roads                      | Admiralty               | do.                               | do.                      | ii.   |
| Re-laying-up Roads                      | Hackney Union           | W. Barnett                        | August 29th              | ix.   |
| Re-laying-up Roads                      | Romford Local Board     | Official                          | Sept. 1st                | ix.   |
| Re-laying-up Roads                      | St. Marylebone Grdn.    | J. Anstie                         | Sept. 3rd                | ii.   |
| Re-laying-up Roads                      | Manchester Corporation  | G. H. Hill                        | Sept. 4th                | ii.   |
| Re-laying-up Roads                      | do.                     | do.                               | do.                      | ii.   |
| Re-laying-up Roads                      | North Eastern Ry.       | W. Bell                           | Sept. 5th                | ix.   |
| Re-laying-up Roads                      | do.                     | C. A. Harrison                    | do.                      | ix.   |
| Re-laying-up Roads                      | St. Olave's Union       | Newman & Newman                   | Sept. 6th                | ix.   |
| Re-laying-up Roads                      | County of Norfolk       | T. H. P. Heslop                   | Sept. 7th                | ix.   |
| Re-laying-up Roads                      | Met. Asylums Board      | Official                          | Sept. 10th               | ii.   |
| Re-laying-up Roads                      | Com. of H. M. Works     | do.                               | Sept. 11th               | ix.   |
| Re-laying-up Roads                      | Messrs. F. Gordon & Co. | A. Waterhouse                     | Not stated               | ix.   |
| Re-laying-up Roads                      | School Bd. for London   | Official                          | do.                      | ix.   |
| Re-laying-up Roads                      | War Department          | do.                               | do.                      | ii.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.    | By whom Advertised. | Salary.       | Applications to be in. | Page. |
|---------------------------|---------------------|---------------|------------------------|-------|
| Deputy-Assistant Overseer | Brighton Guardians  | 150l. } 900l. | August 28th            | xiv.  |
| Inspector and Surveyor    | Cardiff U. R. S. A. | 150l.         | Sept. 7th              | xiv.  |

**BEKHAMPTON.**—For alterations and additions to the new Edward VI. Grammar School. Messrs. Battersby & Huxley, architects:—  
H. Fincher.....£5,610 0 0  
Batman & Fotheringham.....5,539 0 0  
J. & J. Greenwood.....5,205 0 0  
Holliday & Greenwood.....5,147 0 0  
B. E. Nightingale.....5,030 0 0  
S. Grist.....4,988 0 0

**BERMONDSEY.**—For the erection of floor-cloth and poleum warehouse, &c., Page's-wall, Bermondsey, for Messrs. Kinton & Co. Messrs. Tolley & Sons, architects, quantities by Messrs. Parr & Sons, New Broad-street office:—  
J. Waddington.....£13,375 0 0  
F. Tarrant.....12,760 0 0  
J. Grover & Son.....12,350 0 0  
J. W. Falkner.....12,337 0 0  
Gould & Brand.....12,229 0 0  
T. J. & J. Greenwood.....11,827 0 0  
T. Simpson.....11,950 0 0  
W. & F. Croaker.....11,923 0 0  
J. Robson.....11,921 0 0  
W. Marriage.....11,829 0 0  
Smith & Bullied.....11,889 0 0  
J. Woodward.....11,018 0 0  
Baker & Son.....11,625 0 0  
W. Shephard.....11,474 0 0

**CAERPHILLY.**—For erecting coach-house and stable, &c., for Mr. J. H. Phillips, architect:—  
H. J. Ransom, Cardiff (accepted).....£150 0 0

**CARMARTHEN.**—For the erection of rectory at Cefn, for the Rev. J. D. Jones. Mr. D. Jenkins, architect, Llanidlo:—  
T. Davies, Llanstephan.....£1,350 0 0  
J. Williams, Knighton.....1,247 0 0  
Rees & Evans, Merthyr.....1,150 0 0  
Thomas & Son, Merthyr.....1,155 0 0  
B. Howell & Son, Llanelli.....1,127 18 5  
J. Lloyd, Carmarthen.....1,060 0 0  
W. Evans, Carmarthen.....939 0 0  
(Architect's estimate, £938)

**CHELMSFORD.**—For works at the waterworks, for the Chelmsford Local Board:—  
A. S. B. S. C. S. D. S.  
J. Gould, South-amp-ton.....709 0 0, 2,707 13 2, 154 4 1, 185 10 0  
Crawley & King, London.....766 9 0, 3,260 11 0 0 0, 2,163 19 0  
Langley & Co., London.....677 0 0, 2,926 0 0, 1,888 0 0, 1,844 0 0  
Bell, Tottenham.....666 0 0, 3,989 0 0, 2,189 0 0, 1,821 0 0  
Leytonstone.....850 0 0, 3,989 0 0, 2,216 0 0, 1,869 0 0  
Potter, Chelmsford.....641 13 0 0 0 0 0 0 0 0 0 0  
Hos. J. M. Rike.....1,133 2 0 0, 4,564 18 0 0 0 0 0 0 0 0 0 0  
West Bromwich.....1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
O. Bretell.....1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
Lowson.....1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
G. Mumford, Colchester.....1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
Limes & Sons, London.....1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0  
Botterill, London.....934 0 0, 3,469 0 0, 2,094 0 0, 1,897 0 0  
A. Reservoir; B. Tower, &c.; C. Tank, &c.; D. Mains, &c.  
\* Accepted.

**CHESEA.**—For the erection of four shops in Pond-place, Chelsea, for Mr. Henry Cadbury Brown:—  
C. Ansell.....£3,698 0 0  
Avis & Co.....3,694 0 0  
W. R. Williams.....3,679 0 0  
Lewin & Sons.....3,613 0 0  
T. Elkington.....3,392 0 0  
Stimpson & Co.....3,360 0 0  
Wells.....3,350 0 0  
Turtle & Appleton.....3,340 0 0  
James Stead.....3,328 0 0  
Simmonds Bros.....3,267 0 0  
Jones Bros. (accepted).....3,235 0 0

**FOREST GATE.**—For repairs to eight houses at Forest Gate, for Mr. H. Hines, of Exmouth-place, Mr. Driver, architect:—  
Williams.....£219 0 0  
Ayercher.....180 0 0  
Hawkins (accepted).....157 10 0

**HAMPSTEAD.**—For erecting and finishing house, Netherhall-terrace, Hampstead, Mr. George Sherrin, architect:—  
James Chapman, Hackney.....£2,320 0 0  
(No competition.)

**HAMPSTEAD.**—For alterations at Upper-terrace Lodge, Hampstead Heath, for Miss Coates. Mr. Basil Champneys, architect. Quantities by Mr. E. J. Pain:—  
Wm. Pearce, Hampstead (accepted).....£493 18 3  
(No competition.)

**HARROGATE.**—For the erection of a Wesleyan Chapel and school at Starbeck, Harrogate, Mr. T. Butler Wilson, architect, Leeds:—  
Accepted Tenders.

J. Sadler, Mason, Starbeck.....£364 0 0  
R. Dent, Joiner, York.....219 0 0  
J. Paddon, Plasterer.....39 10 0  
Geo. Luzenby, Plumber.....49 0 0  
Shepherd, Slater, Harrogate.....38 15 0  
A. Dougill, Hot-Water, Leeds.....41 18 6  
A. Knowles & Son, Painters, Harrogate.....18 0 0

**HENDON.**—For certain paving and kerbing works, carriage-ways, street crossings, &c., in the main road, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-Mem. Inst. C.E., Surveyor:—  
T. Adams, 24 per cent. below schedule of prices.  
Norrell & Robson, 3 per cent. below schedule of prices.  
S. Hudson, 3 per cent. below schedule of prices.  
George Bell, 8 per cent. below schedule of prices.  
\* Accepted.

**HENDON.**—For making up Sunny-gardens-road, Sunny-gardens-road, Sunny-gardens-terrace, Nursery-walk, and Heading-street, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-Mem. Inst. C.E., Surveyor:—  
Nowell & Robson.....£5,687 0 0  
Geo. Bell.....5,587 0 0  
Neave & Son.....5,335 0 0  
R. Ballard.....5,315 0 0  
T. Adams.....5,097 0 0  
\* Accepted.

**Harrogate.**—For making up Sunny-gardens-road, Sunny-gardens-road, Sunny-gardens-terrace, Nursery-walk, and Heading-street, for the Hendon Local Board. Mr. S. S. Grimley, Assoc.-Mem. Inst. C.E., Surveyor:—  
Nowell & Robson.....£5,687 0 0  
Geo. Bell.....5,587 0 0  
Neave & Son.....5,335 0 0  
R. Ballard.....5,315 0 0  
T. Adams.....5,097 0 0  
\* Accepted.

**LLANDEBIE.**—For additions and repairs to Derwydd Mansion, for Mr. A. S. Stepney Gullett. Mr. D. Jenkins, architect, Llanidlo. Quantities supplied:—  
B. Jenkins, Brecon.....£2,976 0 0  
W. Evans, Carmarthen.....2,878 0 0  
W. Bowers & Co., Hereford\*.....2,705 15 0  
\* Accepted.

**LLANDILO.**—For addition and alteration to Tregib Mansion, for Mr. J. W. Gwynne Hughes, J.P. Mr. D. Jenkins, architect, Llanidlo. Quantities supplied:—  
Thomas & John Brown, Llanelli.....£4,157 2 4  
John Williams, Knighton.....4,048 9 3  
Bowers & Co., Hereford.....3,838 4 8  
E. Mercer, Llanelli.....3,789 10 0  
B. Howell & Son, Llanelli (accepted).....3,647 0 0

**LLANDILO.**—For repairs to bank buildings, for Mr. W. Thomas, Mr. D. Jenkins, architect, Llanidlo:—  
Thomas, Llanidlo.....£200 0 0  
Evans, Llanidlo (accepted).....80 0 0

**LLANDOVERY.**—For alterations at Cefn, for Mr. A. Gwynne Vaughan, Mr. D. Jenkins, architect, Llanidlo:—  
B. Jenkins, Brecon.....£250 0 0

**LLANGLYBRI.**—For the erection of boys and girls' schools at Llanelli, Mr. E. H. Lingon Barker, architect:—  
J. Williams, Knighton.....£3,558 0 0  
Wall & Hook, Brimscombe.....3,537 12 0  
Geo. Mercer, Llanelli.....3,499 8 0  
D. C. Jones & Co., Gloucester.....3,382 0 0  
John Evans, Llanelli.....3,188 0 0  
John Inwood, Worcester.....3,138 0 0  
David Hughes, Llanelli.....2,971 0 0  
John Griffiths, Carmarthen.....2,958 0 0  
Williams & David, Llanelli.....2,955 13 8  
Thomas & John Brown, Llanelli.....2,880 13 8  
David Davies, Llanelli (accepted).....2,775 8 10

**LLANGDOCK.**—For the restoration of St. Cadog parish church, for the Building Committee. Mr. D. Jenkins, architect, Llanidlo. Quantities supplied:—  
W. Evans, Carmarthen.....£2,700 0 0  
D. Thomas, Llangdock.....2,440 0 0  
Evans Bros., Llanddewi-Brefl.....2,224 8 6  
J. Williams, Knighton.....1,872 0 0  
E. Mercer, Llanelli.....1,568 0 0  
H. Davies, Pontardawe.....1,750 0 0  
B. Jenkins, Brecon (accepted).....1,540 0 0

**LLANON.**—For the erection of house and shop, for Mr. W. H. Young, Crosshands, Mr. D. Jenkins, architect, Llanidlo:—  
T. Davies, Llanstephan.....£510 0 0  
R. Peregrine, Llanon.....420 0 0  
D. Jones, Gornal (accepted).....335 0 0

**LLANON.**—For the erection of a Congregational schoolroom, at the Tumble, Llanon, for the Building Committee. Mr. D. Jenkins, architect, Llanidlo:—  
P. Evans, Penrygoe.....£230 0 0  
E. Peregrine, Llanon (accepted).....182 0 0

**LLANON.**—For the erection of schoolroom, for the Rev. W. Jones, Vicar, of Llanon. Mr. D. Jenkins, architect, Llanidlo:—  
D. Peregrine, Felinfoel.....£220 0 0  
D. Jones, Gornal (accepted).....200 10 0  
E. Peregrine, Llanon (accepted).....173 0 0

**LONDON.**—For rebuilding the White Lion Tavern, James-street, Covent Garden, for Mr. Stephens. Messrs. Alexander & Gibson, architects, 40, Great James-street, Bedford-row:—  
Hawkins.....£2,698 0 0  
Howard & Co.....2,374 0 0  
Mastock Bros.....2,370 0 0  
J. Beale.....2,270 0 0  
T. L. Green.....2,237 0 0  
Gould & Brand.....2,189 0 0  
Patman & Fotheringham.....2,133 0 0

**LONDON.**—For rebuilding the Flying Horse tavern, Watlington-road, S.E., for Mr. E. J. Haags. Messrs. Alexander & Gibson, architects, 40, Great James-street, Bedford-row:—  
Patman & Fotheringham.....£2,573 0 0  
J. Anley.....2,508 0 0  
T. L. Green.....2,437 0 0  
Gould & Brand.....2,433 0 0  
Wilkinson Bros.....2,379 0 0  
Mastock Bros.....2,377 0 0  
J. Beale.....2,283 0 0

**LONDON.**—For alterations, &c., Nos. 1 and 2, White-cross-place, Mr. Banister Fletcher, architect:—  
Kiddle & Son.....£1,255 0 0  
B. E. Nightingale.....1,070 0 0  
J. Garrud.....1,041 7 6

**LONDON.**—For carcassing of premises in Gray's Inn-road, belonging to Mr. Frederick Sage. Mr. Walter Graves, architect. Mr. Walter Barstow, surveyor:—  
Colls & Sons.....£1,890 0 0  
James Morter.....1,803 0 0  
Grover & Sons.....1,794 0 0  
Lawrence & Son.....1,779 0 0  
Patman & Fotheringham.....1,775 0 0  
Brass & Sons.....1,769 0 0  
Pink & Fryer.....1,747 0 0  
B. E. Nightingale.....1,723 0 0  
Stimpson.....1,680 0 0  
J. R. Hunt.....1,646 0 0

**LONDON.**—For alterations, &c., to Nos. 85 and 92, Long Acre, for Mr. William Robinson. Mr. William Simmons, architect:—  
Coulson Bros.....£295 0 0  
J. B. Colvill.....287 0 0  
Wright.....263 0 0

**LONDON.**—For pulling down Nos. 274 and 276, Wandsworth-road, and building on the site of same The Bell Tavern, for Mr. J. Clements. Mr. H. Wakeford, architect, 2, Larkhall-lane, Clapham:—  
Drew & Chadman.....£2,559 0 0  
Pyle, Williams, & Carrett.....3,323 0 0  
Garrett & Son.....3,150 0 0  
Lathley Bros.....2,590 0 0  
Holloway Bros.....2,543 0 0  
Wagner.....2,532 0 0  
J. Beale, Westminster Bridge-road.....2,529 0 0

LONDON.—For repairs to be done at the Licensed Victuallers' Asylum, Old Kent road, London, S.E. Mr. W. P. Potter, architect.  
 B. Cook, Stonecutter-street..... £37 0 0  
 R. J. Amos, Deptford..... 232 10 0  
 Simmonds Bros., Chelsea..... 379 2 6  
 W. Wells, Paddington..... 240 10 0  
 W. Wythe, Dalston..... 180 0 0  
 J. Walker, Poplar (accepted)..... 118 0 0

LONDON.—For the erection of stable and warehouse premises in North-road, King's-cross, N., for Messrs. Young Bros. Messrs. Weatherall & Green, architects. No quantities.  
 Wall Bros..... £1,397 0 0  
 Mattock Bros..... 4,275 0 0  
 Harris & Wardrop..... 3,235 0 0  
 Lathby Bros..... 2,793 0 0  
 J. H. Johnson..... 2,231 0 0

LONDON.—For alterations and new bar fittings at the George and Dragon, Walworth-road, for Mr. F. E. Davy, Mr. G. Treacher, architect, 23, Carter-lane, E.C. Quantities supplied—  
 Goodall..... £1,923 0 0  
 Turtle & Appleton..... 1,875 0 0  
 Redwell..... 1,800 0 0  
 Spencer..... 1,745 0 0  
 Lascelles..... 1,698 0 0  
 Mills..... 1,680 0 0  
 Tysman..... 1,552 0 0  
 J. Beale, Westminster Bridge-road..... 1,548 0 0

LONDON.—For studio, Dartmouth Park Hill, N., for Monsieur G. Monbard. Messrs. Alexander & Gibson, architects, 40, Great James-street, Bedford-row.  
 E. H. Blunt..... £280 0 0  
 [No competition.]

LONDON.—For alterations and additions to No. 2, Kensington, Glen-square. Mr. W. Jacob Gibson, architect, 30, Great James-street, W.C.—  
 T. L. Green..... £589 0 0  
 Wm. Giblin & Son..... 418 10 0  
 Macfarlane Bros..... 374 0 0  
 E. Nunn..... 362 0 0  
 W. B. Head & Son (accepted)..... 346 0 0

LONDON.—For alterations and additions to No. 34, Cleveland-square. Mr. W. Jacob Gibson, architect, 36, Great James-street, W.C.—  
 E. Nunn..... £255 0 0  
 W. B. Head & Son..... 525 0 0  
 Wm. Giblin & Son..... 519 10 0  
 Macfarlane Bros. (accepted)..... 508 0 0

LONDON.—For alterations and additions to Champion House, White Hart-street, Strand, W.C. Mr. J. W. Stanley Burnmaster and Mr. W. Jacob Gibson, architects, 30, Great James-street, Bedford-row—  
 Wm. Giblin & Son..... £225 0 0  
 Macfarlane Bros..... 462 0 0  
 T. L. Green (accepted)..... 479 0 0

NEW BARNET.—For the building of two pairs of semi-detached villas, residences at New Barnet, for Messrs. Blake & Farrar—  
 T. Pear & Co..... £1,810 0 0  
 E. Doverhouse..... 1,790 0 0  
 Dover, Wood, & Co..... 1,690 0 0  
 Bishop Bros. & Marston..... 1,623 0 0  
 W. Pavey..... 1,416 0 0  
 Harrison & Crab, Enfield (accepted)..... 1,393 0 0  
 J. P. Groom & Co..... 1,335 0 0

PUTNEY.—For erecting house and stabling at Putney, for Mr. A. Gower, Mr. H. B. Hagen, architect—  
 W. H. Ashford & Co., West Kensington..... £2,100 0 0  
 [No competition.]

WALWORTH.—For alterations and additions to Newington Workhouse, Westmoreland-road, Walworth, for the Guardians of the Poor of St. Saviour's Union, Messrs. Henry Jarvis & Co., architects, 39, Trinity-square, Southwark, S.E.—  
 M. Gentry..... £11,673 0 0  
 J. T. Chappell..... 11,653 0 0  
 W. M. Davis..... 11,600 0 0  
 W. Downs..... 11,450 0 0  
 J. Tyerman..... 11,375 0 0  
 Bees & Son..... 11,319 0 0  
 Wall Bros..... 11,186 0 0  
 Lawrence & Sons..... 10,938 0 0  
 Kirk, Knight, & Co..... 10,800 0 0  
 Bunting & Son..... 10,720 0 0  
 Kirk & Randall..... 10,720 0 0  
 J. Longley, Crawley..... 10,151 0 0

## TO CORRESPONDENTS.

I W. your communication to the Editor of the Builder as an editorial paragraph—W. P. M. & S. has appeared in our last week's issue: see p. 111, ante.—If J. A. already dealt with: see Note in last week's issue of 11th inst.—W. H. B. (thanks): A. W. R. S.—G. H. B.—B. & R. (thanks)—R. A. F.—E. L. B.—J. B.—B. H. B. (too late).  
 As statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.

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 We cannot undertake to return rejected communications.  
 Letters and communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.  
 All communications on technical, literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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The Publisher and his assistants are responsible for DRAWINGS, TESTIMONIALS, &c., left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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# The Builder.

VOL. LV. No. 2377.

SATURDAY, AUGUST 25, 1894.

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### The New Edition of "The Stones of Venice."



HE appearance not long since of a fourth edition of "The Stones of Venice," in a form far more sumptuous than that of any previous editions, —with abnormally thick paper, wide margins, and a consequently greatly increased portliness and importance in the scale of the three volumes of which it still consists,—seems to imply an expectation on the part of its author that it is to take a permanent place as a literary monument among books treating of art and architecture. There is plenty of evidence, indeed, that the lapse of time has in no way attenuated Mr. Ruskin's explicit belief in himself and his writings as the sole fount of artistic truth. The appearance of the new edition, however, has not evoked any marked amount of public attention or public rapture. The new editions of his and others of the author's works have all, we are told, been placed at once—subscribed for in advance, and so on; but there is no doubt a sufficient numerical following of disciples to effect this, without going beyond the circle of the faithful. Mudie's, one of the best touchstones of the degree of public interest which a book excites, has had no special demand on this occasion, and has not, we believe, found it necessary to secure a copy even of the new edition. But there are a number of copies issued, at all events, in a form which is evidently intended to indicate a persuasion of the permanent value of the work on the part of those who put it forth. As to that, Time tries every book with incorruptible impartiality, and thick paper and wide margins are no security for immortality. The point with which we are concerned here is that "The Stones of Venice" professes to be in great measure a kind of critical treatise on the spirit and the meaning of Gothic architecture, and to some extent on the meaning and on the essential laws of architecture generally. And some of its teaching on this

subject, re-issued with all its old fallacies, is so misleading and wrong-headed that it ought not to be so solemnly republished without a protest.

"The Stones of Venice" is in reality an immense rhetorical rhapsody, of exaggerated and unwieldy dimensions, over the memorials of what is without doubt the most poetic and enchanting in its site and associations of all cities since the date of that "clear-walled city by the sea" where Pallas Athene had her shrine. In some respects, indeed, Venice surpasses even Athens in picturesque interest and significance. Her sons never attained the same intellectual precedence; her idea of life was far more sensuous. But the situation of Venice as the meeting place of East and West; the gorgeousness of colour which hung over her architecture and her pageants; the picturesque incident of her position, reflecting all her architectural glories in the sea out of which they seem to rise; all these influences have exercised a spell over the minds of men down to the present day, as they did over that of Philip de Commines 400 years ago, when he described Venice, after his first sail up the grand canal, as "La plus triumpante cité que j'aye jamais vue": a testimony which is interesting as showing (a point which has escaped Mr. Ruskin, by the way) that the fascination which Venice exercises over us now is no mere delusion of association with the past; that it was as powerful when Venice belonged to and acted in the present. "The Stones of Venice" is the product of a remarkably impressionable mind, intoxicated with the associations and suggestions of the place, and possessed of a rare and apparently exhaustless power of rhetorical expression. Everything is fish that comes to Mr. Ruskin's net, and his rhapsody on Venice carries us from architecture to morality and religion, and criticisms on Dante, and what not in heaven and earth, with no sort of logic or sequence: one idea suggesting another, and all clothed in such picturesque language that one can hardly open a page without a sentence that will be worth quoting, for the way in which it is put, merely as a pointed and picturesque saying. But all this does not make a "book" in the permanent sense of the word: it is a rhapsody, and rhapsodies seldom last much beyond the generation to which they were immediately addressed. We can hardly imagine that one hundred years hence any one will turn to this medley of eloquent

fantasy for serious study or information; it will survive as a curiosity on the shelves of libraries, and may furnish apt quotations to future writers on art, and that is all.

In the meantime, it is re-issued as a book containing what the author calls (preface to third edition) "the ground-work of all my subsequent architectural teaching," and professes to contain "an analysis of the best structure of stone and brick building, on a simple and natural scale" (what these latter words may mean, or in what sense the word "scale" is used, is not very apparent). This for the first volume; the remaining two volumes are said to show "how the rise and fall of the Venetian builder's art depended on the moral or immoral character of the State." There seems to be some uncertainty, however, about this very ambitious programme, for in almost the next sentence we read that the work partly also consists "of an analysis of the transitional forms of Arabian and Byzantine architecture." The author remarks that this portion alone has been read by and had an influence on the architects and architectural readers of the day; and immediately assures them, with that peculiar morbid vanity which is one of his most marked characteristics, that this is "the only imperfect portion of his book." That is Mr. Ruskin all over; if people venture to agree with him, even that does not satisfy his self-appreciation; they are then to be told that they admire him in the wrong place. This method, provided it be carried out with unblinking consistency, is wonderfully effective; it imposes on the majority of unlearned people, and has, in fact, imposed on a whole generation. As to this special analysis of transitional forms of Byzantine and Venetian work, the chief value of it consists in the fact that the author has collected a considerable number of profiles of mouldings, many of them curious in their bearing on the history and development of style, and which, assuming the correctness of the profiles,\* are of definite value; though a trap is prepared for the unwary reader in the description of these plates as "Gothic mouldings," the profiles labelled with this title being, in fact, as unlike the character of Gothic mouldings properly so called as anything could well be; they

\* "The Stones of Venice." By John Ruskin, LL.D., Honorary Student of Christ Church, and Honorary Fellow of Corpus Christi College, Oxford. With Illustrations drawn by the Author. Fourth Edition. (Three volumes,—"I, The Foundations," "II, The Sea Stories," "III, The Fall.") Published by George Allen, Sunningdale, Orpington, Kent. 1894.

\* Of Mr. Ruskin's conscientious correctness as a representative of architecture pictorially we have always had a high opinion. But we know very well that people who will draw correctly by eye what they see of architectural detail are often not to be trusted to in the matter of getting profiles of mouldings, which is a very different problem from sketching, and requires a special procedure.



are Venetian Gothic, if you will, but that only serves to illustrate a kind of confusion of nomenclature and even of idea which runs through the whole book, the author having chosen to take the older type of Venetian work as representing "Gothic," whereas it never does represent the kind of architectural character which properly belongs to Gothic work, least of all in the profiles given, many of which are little removed from pure Classic; the amateur reader, nevertheless, is liable to be ensnared into thinking that he has here presented to him the characteristic forms of "Gothic mouldings." The grouping of the Venetian capitals into four "flower-orders" taken from supposed resemblances to flowers,—the lily, the tulip, and two forms of magnolia,—which are figured on Plate X. (Vol. II), along with the capitals supposed to be suggested by them, is a mere piece of pretty talk, fit only for children. Indeed, the author admits that his two species of magnolia are unsatisfactory, and that he wanted two distinct flowers, but "it was early Spring, and he could not get any other examples,"—an admission which in itself shows how completely arbitrary is the comparison, made merely because it is attractive and pretty in the eyes of ignorant readers.

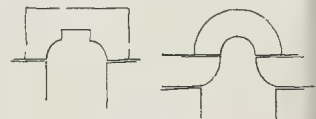
Let us turn, however, to the first volume, which is intended to represent the groundwork of the author's architectural teaching. Here, again, there is a confusion of motive which vitates the whole book. This volume is described in the preface to the third edition as "an analysis of the best structure of stone and brick building." In reality, however, the foundation of the whole book is an attack on Renaissance architecture, and a recommendation of Gothic. With his usual quickness in seizing on anything which he can turn to rhetorical account, Mr. Ruskin lays hold of a remark from that same account by Philip de Commines of his first sight of Venice, to the effect that he (Philip) noticed the difference between the buildings a hundred years old, and which were covered with painted decoration, and those made since a hundred years, which had marble floors filled in with porphyry and serpentine brought from a hundred miles away. "There had, indeed, come a change over Venetian architecture in the fifteenth-century," says the author; "we English owe to it our St. Paul's Cathedral, and Europe in general owes to it the utter degradation or destruction of her schools of architecture, never since revived." That is the true *raison d'être* of the book; it is an essay with many and various digressions,—digressions which often threaten to swallow up the main subject altogether,—on Gothic *versus* Renaissance, which to Mr. Ruskin is synonymous with truth *versus* falsehood. It is curious at this moment to hear the existence of St. Paul's referred to as one of the architectural disasters that we have to lament. "The wheel has come full circle" since this was first written. St. Paul's was then just beginning to be deposed from æsthetic favour, and has now just come up again with the change of architectural taste: but that is by the way. It is unfortunate that Mr. Ruskin was led,—apparently from mere accident of circumstance, or perhaps because Venice was then a rather unworked field—to repose his main argument on the contrast of Venetian Gothic with Classic. The result of this is that his whole plea for Gothic *versus* Classic is based on materials which are not truly Gothic, and do not express the real greatness and strength of Gothic architecture, which are not represented in Venice; and this false position betrays him, as we shall see, into some perfectly absurd fallacies in his definition of the principles of style and architectural construction.

Let us follow this portion of the work briefly through the various chapters into which it is divided. We commence with the virtues of architecture, the chief of which are defined to be strength or good construction, and beauty or good decoration. That is not altogether the way to put it, for there may be architectural beauty with little or nothing of what is usually called "decoration." There are remarks, moreover, which

might have been justifiable at the time of the first edition, but which ought to have been modified in this edition. It is very well, and rather to the point, to ask "whether any living soul in London likes triglyphs;" and it might have been well to the point to ask, forty years ago, "Do you suppose that any modern architect likes what he builds, or enjoys it?" To put such a query in the presence of some of the architects who are at work now among us is an impertinence: there are so many in Mr. Ruskin's writings that perhaps one more or less need not count: but this is a rather gross one. Then we come to the six divisions of architecture, which are not very clearly made out; but the small diagrams illustrative of various principles of roofs are well put for the general reader. The author divides the wall into "base," "wall veil" (meaning the expanse of wall—a good term), and coping or cornice. About the "wall base" we have no quarrel to make, but in the chapter on the "wall veil," Mr. Ruskin is far too positive about the contemptible character of rustication as a means of architectural expression. He says "every one knows a building is built of separate stones, but nobody wants to count them." This sounds specious: and no doubt rustication has been abused by designers who did not know how better to fill up a wall. It is only a subordinate source of expression, but it is one; and, moreover, the view that the fact of a building being built of different stones is of no architectural importance or significance is open to question. The chapter on the cornice puts very well, in a manner perhaps rather too naive, the meaning and function of this feature. It is a vice of Mr. Ruskin that, in his desire to write plain thoughts on architecture for general readers, he is constantly lapsing from simplicity into childishness, and an affectation as if he were addressing children who could only understand words of one syllable. It is a foolish and (to people who are not children) a rather offensive weakness. He makes, however, a brilliant point, quite in his best way, in putting together (Fig. vii.) a moulding from Cairo and one from Salisbury, nearly similar, only that the English one is undercut for a drip, and remarks how in that little difference between the curves "there is the expression of another and mightier curve,"—the portion, namely, of the earth's circumference which separates Cairo from Sarum. There is the same objection of over-acted simplicity in the chapter on the pier base; it is all true enough, and would do well enough for a class of children; it is namby-pamby for grown-up readers. The chapter on the shaft is well put, on the whole, but no clear statement is made as to the value of diminution and curvature in the shafts of the Classic school, though the author does not fail to draw attention to the very essential and important nature of the distinction between diminished and undiminished shafts. The object of this and the preceding and some of the following chapters, apparently, is to get into the minds of persons who have never thought at all about architecture an idea of the essential character of its problems; to make them think about it. The object is a good one. What is most wanted, perhaps, now as well as when this book was first put forth, is that the general public should be got to think what is the meaning of architecture. The line taken by Mr. Ruskin in these chapters is not a bad one, in a general way. A base is something to give stability to a wall. How would you propose to construct it so as to give the greatest stability? A shaft is a feature to support superincumbent weight; consider it from that point of view, and so on. But it might be done with more point and concentration than in Mr. Ruskin's rambling conversational manner, which, in its affectation of simplicity, often ceases to be really simple. In the chapter on the capital, the diagrams of typical or, as we might say, root forms of capital, are really very good; but the author shows no sense or reason in the manner in which he rejects with contempt so fine a form as the Early English capital, because it clashes with his theories, and displays what he

calls "a dripstone outline," which has no suitability in that position. In the appendix he admits that this form of capital has one character (he means probably "characteristic") "of considerable value,—viz., the boldness with which it stops the mouldings which fall on it, and severs them from the shaft, contrasting itself with the multiplicity of their vertical lines." Just so, and that is intended to be the value of it. There is something, perhaps, in the remark about the deep undercutting of these capitals being rather an attempt at exaggerated force, "like the 'black touches' of second-rate draughtsmen"—a happy bit of side-glance criticism—but it is applicable, if at all, to the comparatively few cases in which the mouldings of these caps are very deeply cut in, leaving only a narrow opening between the edges of the hollow. That is rather a trick of effect, no doubt.

The chapters on the arch are among the worst parts of the book. Where Mr. Ruskin is right about the arch, his descriptions are vague and wanting in precision, and disfigured by contemptible puerility of language. Speaking of the line of equilibrium, which he calls the "arch-line" (an expression that may mean anything), he says, "so the arch-line is the moral character of the arch, and the adverse forces its temptations, and the vices its armour and what else we may help it with." Is this really written for children, or not? It is difficult to understand such foolish verbiage on any other supposition. How does such prattle advance the comprehension of the subject? The chapter on "arch masonry," in which the writer pretends to deal with the stability of the arch, is still worse; and here it is that Mr. Ruskin is led astray by basing his position on Venetian Gothic. Everything the Venetians did must be right, and so there is invented the theory that to thicken the voussoirs of an arch towards the top is to increase its bearing power for the weight over it; for a distributed weight pressing on the haunches equally with the crown, be it observed. The manner in which this is explained is almost too absurd and childish for belief; it will be found on page 128, Vol. I., of the new edition, and it is worth referring to by any practical critic who wants to see what are Mr. Ruskin's notions of the statics of the arch. It is his Venetian proclivities, apparently, that have also led him to the still more extraordinary and absolutely preposterous idea that the pointed arch is truly to be regarded as "a gable": that it is not an arch at all, because "a pointed arch is a contradiction in terms": and in vol. ii. (pp. 213-14), "the so-called pointed arch ought always to be considered as a gable, with its sides curved in order to enable them to bear pressure from without." Was such nonsense ever heard of in a book pretending to give people instruction in architecture? What are the words, "its sides curved to enable them to bear pressure from without," but another definition of the arch? An exceedingly bad and clumsy one, no doubt, but still a definition. There is other evidence that Mr. Ruskin does not even know constructively what an arch is, for in the illustrations of arch masonry on Plate IV., vol. i., he actually puts such forms



as these as "arches," and seems to think they rank as arches even though cut out of one stone. They are, in fact, nothing but bad lintel construction: lintels weakened by having a piece cut out of them. It seems as if Mr. Ruskin had been led into his lean-to theory of the pointed arch because the Venetians constantly built their smaller arches (very unscientifically) in only three or five voussoirs of much greater length than depth—the worst and most clumsy way in which arch masonry



be designed. If he had said that a pointed arch should be described as two segments of arches abutting, rather than as an arch," he might have been right, and the definition would have been in accordance with the mediæval practice of avoiding key-ones and leaving a vertical joint at the apex; but the arch principle is there all the same, the constructive difference being only one of detail. Such is the nonsense uttered, with a foolish face of authority, in a book intended to be an important popular treatise on architecture.

The chapter on the roof is so meagre, in reference to so important a subject, that one may suspect that the author was afraid to say so much about it for fear of getting into difficulties, and it is to be noted that he entirely omits perhaps the most important architectural consideration in regard to the roof, viz., its relation to the substructure, and the manner in which the intended design of the roof inevitably affects the design of the substructure. The chapter on the "Roof cornice" is better, and contains some good criticism on certain time-honoured ways of signing cornices, and on the real meaning and function of the cornice itself. In the chapter on the "Buttress," also, there is much that is good, though it might have been put in much smaller space and in simpler language. The insinuation that the mechanical function of the pinnacles in adding vertical weight is of their real *raison d'être* has something in it, and is, at all events, amusingly put: "If a reader likes to ask any Gothic architect with whom he may happen to be acquainted, to substitute a lump of lead for his pinnacles, he will see by the expression of the face how far he considers the pinnacles decorative members." This, however, is a fallacy, though an amusing one; the answer would be that the weight, according to architectural principles, claims to be added in a decorative form. The remarks on the use of buttresses in modern Gothic, that they are regarded as convenient breaks of blank surface, and general apologies for deadness of wall; they stand in the place of ideas, and, I think, are supposed also to have something of the odour of sanctity about them," form a criticism which has not yet quite ceased to be true about modern Gothic.

The chapter on the "Filling of Apertures" in ordinary language, "tracery") we do not quarrel with; but when we come to that on "Super-imposition" we get Mr. Ruskin at his worst again, except as to mere rhetorical loquacity in one or two places. He commences by informing the reader who has gone through his rambling chapters that "he has now some knowledge of every feature of all possible architecture"; and the consideration then proceeding to the super-position of these features, naturally leads to the question of towers, which, from that of Babel downwards, illustrate super-position in *excelesis*. On this subject the author brings out some of his choicest paradoxes. Every "noble tower" should rise straight from its base to show that it is strong enough in itself, without buttresses; in other words, Italian towers do so, and they are our model. A tower must be vertical in its lines, solid below for strength, and with openings above for lightness; and to emphasize the reason, we are given an illustration of a lofty Italian campanile, with an open gallery in the upper stage, and beside it is placed a badly drawn drawing of a very poor example of a modern English buttressed tower, drawn so as to make it look as weak as possible, and these are labelled, "British: Venetian." This drawing is one of the most impudent and unblushing pieces of claptrap that was ever put into a book; it is almost inconceivable that any writer, if he were silly enough in his young days to insert such an *ad captandum* trick in his book, should have lived a whole life, and grown no wiser or more truthful. The fact that all the finest examples of towers of the English type, ancient and modern, actually have the solid base and the principal lights in the upper story, is nothing: it is the author's use at the moment to uphold Italy and cry down England, and he selects and dresses up his examples accordingly. He makes, in the


eyes of the ignorant, a palpable hit, at the expense of telling them a palpable falsehood. This one drawing would be sufficient to show that the author of this collection of brilliant rhetoric was a teacher utterly untrustworthy. Even if he had drawn his comparison fairly, however, the conclusion is unwarrantable: the tower of diminishing lines is one typical form, that of vertical lines is another: they belong to a different genus, and produce their effect in a different manner.

The fact is,—and the instance we have just given is one of the most marked (we might say most flagrant) illustrations of it,—that the whole of this great three-volume sea of rhapsody is a mere putting-forth of the author's multifarious fancies about architecture, which tread on each other's heels in a kind of promiscuous procession, without order, logic, or sense of fitness or relation. Ideas which are mere momentary skits, to speak, of his own rhetoric, are exalted into the place of undeniable axioms. Illustrations of out-of-the-way incidents in architecture which have happened to attract his sympathy, are given as if they were essential and central architectural forms. We have in one chapter a solemn lecture on the "six orders of Venetian windows," as if these constituted a recognised and definable progression, instead of being merely a fancy of the author's for amusing himself with a classification for which there is no ground and no necessity. In speaking of capitals, again, the author, partly by way of a scoff at the time-honoured "Orders," says there are only two possible orders, that in which the bell of the capital is concave and the foliage takes a hollow line; and that in which the bell is convex and the decoration, lower in relief, or even sunk, follows the convex line. This is a good generalisation, but it is using the word "order," which has acquired a definite meaning, in quite another sense from that in which it is usually understood, and merely confusing the reader, as well as overlooking the important fact that the word "Order" really implies, not a variation in a single feature, such as the capital, but a relation in Classic architecture between all the main parts of the design. It appears as if Mr. Ruskin were absolutely ignorant of this, for he actually says (Vol. I. page 112) that "this connection of the frame of their building into one harmony has, I believe, never been so much as dreamed of by architects." Why, it is the very foundation and the very meaning of the "Orders" as properly understood; it is the point to which the Greeks obviously gave their closest attention, though we have not now the data for following their method in detail. A great deal of the latter portion of Vol. I., on mouldings and ornaments, is good in a sense, but it is vitiated for the purposes of a book of instruction by the fact that everything is sampled from Venetian architecture, and that Venetian Gothic is thus treated as if it were at the centre of Mediæval art, of which art, in its ruling forms, a perfectly false impression is therefore conveyed to the reader.

The fine outbreaks of prose-poetry which occur from time to time in these volumes we can admire as much as any readers (save, perhaps, for a kind of smothered suspicion that they are not quite genuine); the frequent sarcasms at the expense of modern architects and modern architecture we can enjoy as much as those who are guiltless of any connexion with architecture: they are sometimes true, and almost always witty and amusing. But passages of prose-poetry and coruscations of sarcasm will not serve for ever to float a great unwieldy book professing to be an educational treatise, but crammed full of paradoxes, eccentricities, and rhetorical claptrap; at one time presenting accidentals as if they were essentials, at another exhibiting absolute ignorance where knowledge and science are pretended, and diffuse and rambling to a degree that may be truly called portentous. In this respect Mr. Ruskin does full justice to the Spanish proverb as to writers who "leave nothing in the inkstand." All that is of real value in these three big volumes, as teaching or information, might

have been put into half of one of them. The rest is all ornamental diction and flowers of fancy. These have taken a generation of people captive; but it may be doubted whether they will enable the book to survive another generation. The favoured publisher (if we can rightly give him that name) at Orpington may glorify it with fine paper and wide margins, and the fifteen hundred of the faithful may place it for the present reverently on their bookshelves; but if there are second-hand booksellers in the twentieth century they will probably have a good many copies on sale of an æsthetic treatise in three very thick volumes, which will be "bad stock," only saleable for the beautiful execution of many of the illustrations.

# NOTES.

HE Railway Commissioners delivered judgment last week in an action brought by the Distington Iron Company against three railways concerned in dealing with their traffic—the London and North-Western, Furness, and Cleator and Workington. They had been charged 1s. 3d. per ton for carriage of iron-ore for a distance of about seven miles (whereas the maximum rate chargeable according to the companies' Acts is 11d.), and 9d. per ton instead of 6d. for conveyance of pig-iron 3½ miles. A peculiar feature of the case was that the latter very short journey involved the use of lines owned by two different companies—one of which is authorised to charge as for four miles for short distances, and the other as for six miles under similar circumstances. Only a quarter of a mile of the latter line was used in the case in question, and it was argued that the two railways should be considered as one for the purpose of charging for this traffic, and that the four-mile clause of the Workington Company's Act should be applied. The Commissioners considered that as the two short distances together would amount to more than six miles, the applicants might therefore have to pay even more than the charge complained of, if the owners of the quarter-mile worked their line independently, and they had no claim to a reduction. On the other point, however, the applicants were successful, the decision of the Commissioners being not a little influenced by the fact that the defendant companies had threatened, if the rates claimed were not paid, to cease carrying the traffic. Strangely enough, the counsel representing the companies, including Sir H. James and Mr. Balfour Browne, Q.C., who had questioned the jurisdiction of the Commissioners, withdrew from the case upon being overruled on this point. They had contended that inasmuch as the only grievance complained of consisted in an overcharge alleged to be in excess of the Parliamentary maximum, there had been no violation of the Act of 1854, which is directed against undue preference or prejudice. But the threatening position assumed by the companies,—a mode of proceeding which has at least once previously been strongly condemned by the Commissioners,—clearly subjected the complainants to undue disadvantage; and, as Mr. Miller remarked in giving judgment, the position of counsel would have been in no way prejudiced had they remained to assist in the discussion of the case. It was particularly complicated, owing to joint ownership and mutual Acts and working agreements affecting the different companies concerned; and, considering the imposing array of counsel engaged upon the opening of the case, it appeared very strange that only the junior counsel for the applicants was present when judgment was delivered.

**W**HATEVER may be the nature of the Report of the Royal Commission of Inquiry into the working of the Metropolitan Board of Works, the fate of that body is no longer a matter of doubt. It will be extinguished, if not exactly absorbed, by the new County Council for London, which, by clause 8 of Section 40 of the new Local Government



Act, will take over "the powers, duties, and liabilities of the Metropolitan Board of Works" after a certain appointed day, which may be the 1st of April next, "or such other day, earlier or later, as the Local Government Board . . . may appoint." Among the most important of the "powers and duties" of the Metropolitan Board of Works is the administration of the Metropolitan Building Acts. Grave inconvenience and loss have frequently resulted from the fact that during the Board's customary autumn vacation of six or seven weeks, all building applications which cannot be disposed of by the District Surveyors and the Superintending Architect of the Board are held in abeyance. We regretted to see that the effort recently made by Mr. Mossop (the representative of Chelsea at the Board) to mitigate the hardships of the present position were not successful, but we are glad to see that he is not disposed to let the matter rest. In a letter from him which we publish in another column, he very pertinently urges that, although the Board can never enjoy another long vacation to the discomfort of the metropolitan building industry, its successor, the new County Council for London, ought to do something to redress this grievance. As Mr. Mossop points out, the delay in getting plans passed means not only loss of time to builders and building-owners during an appreciable period of good building weather, but lack of employment for many poor men to whom a few weeks' work in the autumn may mean the power to tide over the winter months without receiving alms or Poor-law relief. We trust that this matter will not be lost sight of by the County Council for London, when it has been elected and has taken its work in hand.

THE data for the first meeting of the "National Association for the Advancement of Art," to be held at Liverpool, is now, we believe, definitely fixed for December 3. It will run over five days of that week. On each day, after the Monday, there will be sectional meetings for the reading and discussion of papers, and an address by the President of one or more of the sections. The proceedings on the first day (Monday) will apparently be confined to an opening address by Sir F. Leighton, the President of the Congress, in the evening. On the Tuesday morning Mr. Aitchison will give an address as President of the Architectural Section, and in the afternoon Mr. Tadema will deliver one as President of the Section of Painting. On the Wednesday, Mr. Walter Crane, President of the Section of Applied Art, will deliver his address, and on the afternoon of the same day Mr. Gilbert will read an address as President of the Sculpture Section. On the Thursday the address will be by Mr. Sidney Colvin, as President of the Section of Art-History and Museums; and on Friday afternoon Mr. Mundella will give his address as President of the Section of "National and Municipal Encouragement of Art." The moving principle of the meeting, as we gather from the prospectus, is to be the encouragement of applied art and art industry, the promotion of a general high level of excellence in the fine arts, the education of artists and artisans, the maintenance and development of museums of all kinds, &c. We may reprint the concluding paragraph of the remarks appended to the circular:—

"The demand for pictures, which has existed for some half-century past, tends, apparently, to decrease. The magnitude and long continuance of that demand have produced an over-supply of painters, an increasing number of whom will be forced into the ranks of the unemployed, unless they consider their position betimes, and discover new areas for the exercise of their skill. Changed conditions are involving the overthrow and re-erection of large parts of our hasty-built towns. Architects have thus an opportunity before them, of which they can only take full advantage, if they call in the help of craftsmen trained in the schools of Painting, Sculpture, and the Decorative Arts."

WE print in another column a touching appeal from the Church of St. Mary-le-Strand, which ill-used edifice has, we imagine,

availed itself of the pen of a well-known architect and archaeologist to get its feelings expressed. We, of course, quite concur in the justice and sense of the appeal, which we hope will be attended to by those who are responsible for the shameful misuse of this, the principal architectural ornament of the Strand. It has been repeatedly proposed to pull down this church to widen the street,—an improvement that can be effected without such destruction. It is probably a good thing for the ancient monuments of London that the Board of Works has not much longer to live. We noticed only the other day that a member, at one of the meetings of the Board, expressed his wish to see St. Mary-le-Strand pulled down before the Board went out of existence—by way of showing, we suppose, how much mischief it could be capable of before it was extinguished. It is perfectly intolerable that the conservation of architectural monuments in London should thus be in any degree at the mercy of a body of men some of whom would, apparently, be ready to pull down St. Paul's if they could thereby make what they call a "street improvement."

AN evening contemporary is jubilant over the fact that scarlet geraniums brighten the windows of a long-desolate house in Chelsea, "Carlyle's house in Cheyne-walk" having at last found a tenant, "and the place has suddenly become positively cheerful." The house in question, if Carlyle's, must be that which he occupied during the period 1834-81 in Cheyne-row, formerly No. 5, Great Cheyne-row. There, in order to escape annoyance by a neighbour's Cochon China cock, he rendered the garret so effectually sound-proof as to have nearly asphyxiated himself at the same time. In February, 1886, the Carlyle Society set up a white marble tablet bearing an inscription and a relief portrait, by Mr. C. F. Annesley Voysey, to the author's memory. For some reasons connected, as we then gathered, with a legal dispute about the property, the plaque was temporarily affixed against the western side wall of No. 49, Cheyne-walk; and there it remains to this day. Carlyle's house is No. 24; it is so cited on his grave-stone at Ecclefechan, and he described it to his wife as "probably the best we have ever lived in—a right old strong, roomy brick house . . . rent, thirty-five pounds . . ."

A GOOD deal of attention has been excited lately by the report of the discovery on the Acropolis of a bas-relief representing Athens under quite a new aspect. The telegram, which appeared in many of the daily and weekly papers, stated that the goddess was depicted with a distinctly sad expression. We waited for reliable information, as a "sad Athens" was to the last degree improbable, and these telegraphic reports always aim at sensation. Our Athens correspondent (see "Letter from Athens") states simply that she stands "in an attitude of thought, with her head lowered." This sounds at once possible and interesting. From the *Δελτίον* just published we are able to add to his account that the stèle the goddess is looking at bears traces of having been decorated with painting. The style of the relief is in some respects—e.g. the folds of the chiton—archaic, and may be dated as belonging to the period just before Pheidias. That a very curious and quite unique bit of work has come to light there can be no question. Even the *Δελτίον* (though this paper is by no means a safe guide as regards style) maintains the view that the expression of the goddess denotes distinct sorrow (*ἡ μελαινολία καὶ λύπη*!) But we cling to the view of our more cautious correspondent. We are especially glad to note in his letter that a newly-discovered head has replaced a head already fitted on to a torso in the Acropolis Museum. The Hellenic Journal has twice already raised a much-needed protest against the habit of hasty restoration that obtains in this Museum, and here is a good instance of the necessity of the protest.

THE sum of 7,000*l.* (or an offer) is asked for Banwell Abbey, Somersetshire. This property, of about 17 acres, is situated in the Cheddar Valley, by the Mendips, about three miles north of Axbridge and six east of Weston-super-Mare. The chapel appertaining to the house is, we understand, a relic of the bishop's palace whereof Leland speaks in his Itinerary. The residence here of the bishops of Bath and Wells occupied the site of a monastery which, reputedly founded by Ælfred, was destroyed by the Danes. It had been restored in 1309, and twice in the succeeding century. About 150 years ago Bishop Beckington's Hall, as erected by him in 1443, was altered into a modern house, the chapel, however, being preserved. The village of Banwell, which presents many features of interest to the antiquarian, takes its name from a spring that rises in its midst and provides a large unfauling flow of water.

WE have received the third volume of the Glasgow Architectural Association Sketch-book, which shows a good and interesting collection of mostly small sketches, and a certain proportion of measured work. Many of the free-hand pencil sketches of bits of old buildings are exceedingly artistic in feeling, and have been very well reproduced on toned paper by Messrs. MacLure, Macdonald, & Co. Among these we may mention sketches at Caerlaverock and Lincluden, by Mr. Hunter; Kelso Abbey, and a bit of the choir of Lincoln, by Mr. McGibbon (we presume they are both his: only the first one is signed),—the sketch of Lincoln particularly good; a good sketch of Lincoln centre tower (unsigned). The washed sketches of parts of Rowallan and Falkland Castles, though good, free bits of brush sketching, are perhaps a little too "broad," and that of Rowallan does not seem to convey the character of the masonry very truly. The washed sketch of the gateway of St. John's College, Cambridge, is a better one. That of the Bargello, at Florence, is too heavy in effect, or has come out so in the reproduction. The measured drawings include some things not much known, and of interest, such as the remains of Fortrose Cathedral, &c.

IN pursuance of an order made by Mr. Justice Stirling in the cause of Douglass v. Douglass, Chancery Division, a freehold estate at Shoreditch is to be sold. Covering some 17,700 sq. superficial, the block of buildings comprises the National Standard Theatre and Bishopsgate Hall, in the High-street, together with certain shops and houses adjoining thereto and used in connexion with the theatre, being Nos. 34-5, George-street, Nos. 56-7-8, Holywell-street, and No. 203, High-street. All the premises, the last-named only excepted, are at present vacant. With the theatre, which is ready for occupation, will be sold the fittings, decorations, furniture, wardrobe, and other effects. The Standard Theatre stands opposite to what used to be the London terminus, since a goods depot, of the Great Eastern Railway Company. It was entirely rebuilt in 1867, and since then several structural improvements have been made in it in accordance with the regulations drawn up by the Metropolitan Board of Works.

THOUGH we abstain, of course, from taking any part in religious movements, of any kind, we cannot but express our cordial sympathy with those who have recently been urging in the daily papers the opening of the London churches during a considerable part of each day. Apart from all church questions, as they are debated by "high church" and "low church," we should urge the opening of churches, especially in our hurried and crowded metropolis, as a means of providing weary souls with a place of rest and retreat at times; an oasis in the desert of city life, a kind of repose which many hurried people feel so much the want of. We do not believe there would be any danger of injury being done to the buildings, and the institution of opened churches would, we are convinced, be



ailed by many as a boon, irrespective of creed or church.

THE proposition to have only one class of railway carriages, which was brought forward the other day at the annual meeting of the London and North-Western Railway Company, and which has been the occasion of some correspondence in the *Times* since then, is an exceedingly unnecessary and ill-advised one, and some of the correspondence about it is very foolish. However ready we may be in principle to greet all men as equals and brethren, most people will certainly feel that there is in practice the limitation that our dear brethren should be cleanly in their persons, dress, and habits, before we can feel ready to travel with any and all of them promiscuously in carriages where we must be shut up with them in close contact or some hours. It is notorious that many of them are not so. It is perfectly true that many ladies and gentlemen travel third class at present for economy; it is also perfectly true that many people who are anything but ladies and gentlemen, in the proper sense of the term, do now travel in first-class carriages. But it is nevertheless the fact that travelling in a first-class carriage does lay people under a kind of compulsion to be decently and cleanly dressed, and quiet in their behaviour; and that compulsory third-class travelling does often subject those who are compelled to it from economy to very great annoyance from the personality and manners of the people they are compelled to sit next. It may be pretty safely said that no people of refined habits would ever travel third class if they could afford second or first, except where they could secure a carriage to themselves, which of course can only be done when their party is a large one. To compel all railway travellers to travel by a general class, subject to the companionship of the dirtiest person who may choose to get in, would be a step backward in regard to the comfort of railway travelling which we are confident would be strongly opposed by the most respectable portion of the community. If the railway companies can institute a great national reform in the manners and habits of those who are called the "lower orders," and teach them to keep themselves clean, and if they can undertake to eliminate "Arny" from the world, we shall be very glad to see one railway class for all—but not till then; and we hope the managers of English railway companies will not listen to any such nonsense.

#### LETTER FROM ATHENS.

IN spite of the oppressive heat under which Athens has suffered for the last few weeks, the excavations on the Acropolis have been carried on without interruption. At present the men are at work to the south of the Parthenon, between it and the south wall. The actual discoveries made here have not been specially numerous or important, but, on the other hand, it is possible just at this point to determine very accurately the sequence of the various layers of earth and *débris* by which the level of the Acropolis has been from time to time raised higher and higher in ancient times. Almost at the outset of the excavations it became evident that, before the time of the activity of Pericles, a systematic elevation of the level of the Acropolis had begun. Wherever the living rock lay somewhat lower it was found that the depression was levelled up by layers of stone one above the other, separated by intervening layers of *débris*. Among the layers of stone were masses of fragments of ancient works of art—statues, vases, bronzes, and the like—also a great number of fragments of architecture. All these remains were, without exception, in a damaged condition, and bore evident traces of wilful and violent destruction. In the face of all this mass of fragments of works of art, only one supposition was possible, and that was that this heap of ruins was the result of the sack of the Acropolis by the Persians. The layers of stone and *débris* must have been built up at a date somewhere between the Persian wars and the time of Pericles, and therefore belong to the period of the activity of Kimon. Now the excavations at the south-side of the

Parthenon have further shown that the foundations of the Parthenon, which hitherto it has been customary to attribute to Peisistratos, were contemporary with these stone and *débris* layers; they must, therefore, have been laid in Kimon's time, as Dr. Dörpfeld, starting from other premises, has previously maintained. In fact, it can clearly now be seen that before the foundation of the Parthenon was laid, the living rock was covered by a substantial layer of earth of from 1 in. to 3 in. in depth. Through this a trench had been dug in order that the lowest courses of the building might lie direct in the living rock. The rock had been levelled and smoothed so that the lowest course might rest on a firm bed as soon as ever the first courses were laid. The pieces of rock that were broken off in doing this were utilised to fill up the holes made in digging out the foundations. Then, when all this material of broken rock was exhausted, began the regular system of levelling up, for which the builders employed the architectural fragments and broken works of art which had been lying about since the Persian destruction. It can clearly be seen that the layers of one sort of *débris* succeed to the other sort, and the transition from one to the other can plainly be marked; so that it cannot be doubted that the laying of the foundations of the Parthenon and the construction of these layers of *débris* were contemporaneous.

The ground excavated to the south of the Parthenon consists of three strata of stones, separated by three layers of fine Poros *débris*, and these successive strata have yielded results of some importance, both in sculptures made of Piræus stone and architectural fragments. Among these Poros sculptures may specially be mentioned a third head, larger than life-size, of exactly the same type as the two male Poros heads already found, but of more delicate execution. Unfortunately, only the upper portion of the face is preserved. The head of a bull about twice life-size, and a quantity of fragments of human torsos and the bodies of animals, have also been found. Any safe interpretation of these representations must wait till the work of fitting the fragments together is further advanced. It seems not improbable that we have here to do with pediment compositions. In the department of marble sculptures important acquisitions must be noted. Among these, one beautiful head has proved beyond doubt to belong to the torso of a youth already in the Museum. On this torso a head had been already placed, a restoration now proved to be mistaken.

Further additions have also been made to the restoration of the well-known Moschophoros statue. It will be remembered that in the course of the present year the base of this statue was found bearing the inscription and the feet of the figure. Just now two fragments of the lower part of the body and the upper portion of the thigh have been added. Further, a number of fragments have turned up belonging to the archaic Athene figure which Studniczka attributes to the pediment of the "Old Athene temple," i.e., the right shoulder, both feet, and many portions of the drapery. A marble statue, intact to the knees, must also be noted; it belongs to the regular type of the archaic female figures, of which the Acropolis Museum can now boast such a stately sequence, obtained from the present and from previous excavations. It is possible that this new figure may be fitted on to a head already in the Museum. It is only half-size, but is one of the finest specimens yet found, the execution being of peculiar delicacy and finish, and the rich painted decoration being extraordinarily well preserved. As with the other examples, so also in the case of the present figure, it is only the under-garment that is coloured throughout; the upper garment is left white, but to make up for this, it is decorated with little bright-coloured stars all over, and the borders are elaborately adorned with painted patterns. In conclusion, the discovery of two beautiful works in relief must be noted. On one Athene is represented. The goddess is about one-third life-size. She is armed only with helmet and spear, without the aegis, and she stands as if in an attitude of thought—her head lowered and turned in the direction of a stele that stands near her. The other relief forms the top of a stele, in which there is an inscription of unusual importance, a decree relating to an alliance concluded between Athens and Samos in the year 405 B.C. In the relief, the two towns which conclude the treaty are represented in the form of two female figures extending their hands toward each other. Athens wears her

helmet, and carries her spear and shield; Samos has a sceptre in her left.

For some time past work has been carried on with a view to ridding the Acropolis of the various modern and mediæval buildings on it and in its immediate neighbourhood. In pursuance of this object, a modern portion of the wall which surrounds the theatre of Herodes Atticus has been pulled down; also a portion of the Odysseus bastion has been destroyed, and men are at work laying bare the two Roman towers which flank Beulé's Gate. A considerable number of inscriptions built into these walls have come to light during the progress of the work of demolition.

At Eleusis the excavations of the Archaeological Society have been continued, and have been rewarded recently by the discovery of some remains of wall-paintings of Pompeian style. For Greece, where remains of Roman decorative art are very rare, this is a notable discovery.

A marble group, also found at Eleusis, have proved to be a copy of a group from the left half of the west pediment of the Parthenon. The copy, which is on a very reduced scale, represents a man who is lying on the rock and leaning with his hand upon it for support near him is a kneeling woman. Whether the figure belonged to a copy of the whole pediment, or was simply an isolated group, cannot from the remains existing be definitely determined.

#### THE ARCHITECTURAL ASSOCIATION EXCURSION.\*

WEDNESDAY morning (Aug. 15) saw the party climbing the beautiful "Via Gellia" and across the bare uplands by the Peak Railway, to descend upon the pretty village of Tissington. Here the church, enlarged in recent days, contains but little of interest. There is, however, an imposing monument to one of the Fitz-Herberts who died in 1619, with a characteristic epitaph which calls upon the reader to—

"Silent be  
And doe homage on his knee  
To this reverend Esquire,"

a tribute which the excursionists, under the circumstances, saw no necessity of paying. The Hall is mentioned in guide-books as one of the best examples of Elizabethan architecture in the county, but its external appearance hardly bears out this opinion. It is picturesque enough, with its mullioned windows, and standing among its fine trees; but, as is the case with most Derbyshire manor-houses, there is no detail to reward a near inspection. The gateway, with its broad steps, is, however, a picturesque object. Time did not allow of the projected visit to Norbury, so Ashbourne was next visited. Here there is a fine church, restored some years ago by Sir Gilbert Scott, and described on this occasion by Mr. James Fowler. It is fondly called the "Pride of the Peak," but modern facilities for travelling and comparing distant churches together within a few hours are apt to lend a slightly humorous flavour to such local distinctions. After all, however, the worth of any object is but a comparative quantity, and Ashbourne Church deserves the position long accorded to it. The tower and spire rise to a height of 212 ft., and the staircase is crowned by a little crocketed spirelet. The interior is lofty and spacious, and the view from the tower across the north transept is particularly fine. The aisle of the transept is devoted to a series of altar tombs, mostly of the Cokaynes, whose effigies can be seen through the iron railings that close the arches, lying in rows, in the impressive fashion of the Middle Ages, with their hands on their breasts in the attitude of prayer; outside the railing and against the wall rises an Elizabethan monument with its solid base, its two figures kneeling beneath their arch, while above are slender pyramids and the dearly-loved coat-of-arms, with its numberless quarterings emblazoned in colour. The whole, backed by the clean curves of an Early window and a few scraps of ancient glass, forms a group suggestive of pomp and splendour quite foreign to our prosaic times. Beyond its church, Ashbourne offers but little to the sketcher. There are some plain almshouses, and the gabled front of the Grammar-school, to the garden of which Johnson carried Boswell to see it, accompanied by the headmaster. That is but a poor century ago, but already Time has written on the garden with a

\* Continued from p. 119, ante.



new hand, for on the top of the bank whereon Boswell says the garden lay, a tennis-lawn has been hollowed out. Many respectable old-fashioned houses line the main street, and among them the residence of the Rev. Dr. Taylor, where Johnson came several times to stay in a comfort and plenty that sometimes grew wearisome, for Dr. Taylor was a solid and sober gentleman, with a roomy postchaise, drawn by four plump horses, and a butler decent and grave, like the major-domo of a bishop. Here, too, is the "Green Man," looking older, but not very different from what it looked when Boswell recorded the civility of its hostess, thereby giving the place an unrivalled advertisement.

But, lunch over, the party ascended the vehicles—neither roomy nor drawn by plump horses—and made their way to Bradbourne. Here Mr. Albert Hartshorne received them with great hospitality, showing them over the church (of the history of which he gave a rapid outline) and his own pleasant house—a good and unpretending specimen of a Derbyshire manor-house. Bradbourne, small as it is, has long been a centre of civilisation, for the earliest parts of the church are assigned to a time before the Conquest, and from thence a continuous record is written in its walls. In the churchyard is a still earlier record of a species of civilisation, in the shape of one of those crosses which abound in Derbyshire, covered with interlacing patterns and strange animals, so crudely drawn as sometimes to baffle interpretation.

The principal place visited on Thursday, the 16th, was Haddon Hall, surely the most picturesque stone house in the country. It has so often been described that here little need be said, though at some future time we may possibly enlarge upon the subject. But of all the places on the programme this, perhaps, gave the most pleasure, and the party were soon scattered over the place busily engaged in transferring its beauties to paper. Some sketched the heraldry, some the courtyard, some the work in the chapel, some the lead water-spouts, some the well-known terrace and the steps down which Dorothy Vernon is said to have sped to join the lucky Sir John Manners. All were anxious to carry away something from this storehouse of beauty. But how many read the lesson of those grass-grown courts and the rows of empty rooms? And how many will try to wrest their modern designs so as to accommodate a scrap from this fourteenth-century house? The stonework is crumbling in places, and hitherto but little has been done to reinstate it, a wholesome fear of tampering with the ancient work having withheld the hands of those concerned. But it is evident that something must be done, and that at once. The stone mullions must be renewed in places, if the windows are not to fall to pieces; but it is satisfactory to know that those who take care of the place are alive to this necessity, and that they intend to preserve the building as carefully in the future as they have done in the past.

From Haddon the next move was to Bakewell, where much of the church has been rebuilt. There are some good monuments of the Vernons and the Mannesses of Haddon. One to Sir George Vernon and his two wives is remarkable in that the inscription records them all three as having died in 1566, the space for the last numeral being left blank in each case. Here, too, is a handsome wall monument to Sir John Manners and his wife Dorothy, the pair who eloped together. At the other end of the chapel is an extravagant monument to a son of Dorothy and her husband, consisting of three tiers of sculptured figures, including the knight and his wife and nine children. As is not infrequently the case at this period, an extreme simplicity of character, or else a sly humour, prompted the application of appropriate texts to the various figures. The eldest child died young, and is represented as standing in its niche completely enveloped and tied up in its swaddling clothes; over its head is written, "Mine age is nothing in respect of thee." There is some good wood-work in the screens, and there are many scraps of ancient crosses in the south porch, as well as a very good one in the churchyard. Youlgreave, which was next visited, has a good church, with a fine tower. The whole has been very carefully restored by Mr. Norman Shaw, whose details were as eagerly scanned by many of the party as if they had been four centuries old. The register here dates back to 1558, when registers were first kept. Among its thousands of uninteresting entries occur two exceptions. One is a note of

the proclamation of James I. at Bakewell, hard by; the other is an account of a terrible fall of snow in 1614, which began in January and went on more or less continuously for two months, filling up and levelling all depressions in the earth, if not actually some of the valleys. An unusual civility was shown here to the party by the ringers, who rang the whole of the bells, so that the excursionists might judge of their tone.

On Friday morning a train carried the members to Nottingham, en route for Wollaton, where Lord Middleton's house was inspected. Before going over the place, however, the following paper was read by Mr. J. A. Gotch:—

#### Wollaton Hall.

The house before which we now stand speaks for itself. Probably there is no house in England (I at any rate know of none) which is designed in so lordly and imposing a manner. The question has often been asked,—Who was the architect? and to it several answers have been given. Huntingdon Smithson, who built Bolsover; Robert Smithson, who lies buried in the church hard by; John of Padua; and John Thorpe, have all received the credit of this fine piece of work. With your permission I will set forth, so far as I know them, the claims of these various gentlemen, so that you may judge for yourselves. First of all, Huntingdon Smithson may be dismissed, since his claim arises from being confused with the other Smithson. Secondly, John of Padua may be followed, since no evidence exists that he had any thing to do with the place, and he appears only from being confounded with John Thorpe. Now these two Johns cannot be one and the same, because John of Padua is recorded to have received payment from the Crown at such a date as would give him, were he also John Thorpe, seventy years of active practice. The claimants, therefore, are narrowed down to Robert Smithson and John Thorpe. Smithson's claim rests upon his epitaph, which is as follows, and you may see it for yourselves in Wollaton Church:—"Here lyeth y<sup>e</sup> body of Mr. Robert Smithson, Gent. Architector and Surveyor unto the most worthy House of Wollaton, with Diverse others of great account. He lived in y<sup>e</sup> fayth of Christ 79 years, & then departed this life y<sup>e</sup> xvth of October Anno Dmi 1614." Now, to read this literally we might, in these days, conclude that Smithson was not only architect of the place, but also took out his own quantities, which some people would at once say was incompatible with the subsequent statement that he was a good Christian. But, leaving that point, the question is, how are we to interpret the phrase "Architector and Surveyor unto the most worthy house of Wollaton"? It may mean that he designed the place, or it may mean that he was surveyor to the house just as one might be (and, indeed, would be, if the opportunity offered) surveyor to a diocese, or to a London company.

New let us examine John Thorpe's claim. This is founded, as all his claims are, upon his book of MS. plans in the Soane Museum, wherein occur a plan and an elevation or "upright" of the house. Now, there are three views, at least, of what this book is. Some say it is a collection of plans from which the houses were built; some that the drawings represent houses built by some one else, and only measured by Thorpe, as any of us might measure a house that we admired. The third view is that they are sketches for designs. Now, the first two views are untenable, for this reason, that the plans do not accurately represent the buildings of which they are drawings. While the general similarity is obvious, the differences are such that it is impossible to suppose either that the houses were executed from them, or that even a careless man could offer them as representing the work as actually built. Take these drawings of Wollaton, for instance. The plan, while generally representing the actual building, differs considerably in essential particulars, such as the width and divisions of the rooms; while the elevation shows nothing of the basement story, and shows another arrangement of the columns, and of the corner turrets of the pavilion, not to mention other points. Nevertheless, the general likeness is striking. Now, if they were the sketch or preliminary plans, the difficulty is solved at once; and that is what I believe they are. Some light may shortly be thrown upon the matter by the examination of the building accounts of the house, which have come to light within the last two weeks, for Lady Middleton, who takes an enthusiastic interest in the history

of the house and family, informs me that she found the building accounts of Wollaton less than a fortnight ago. From a glance, which was all she has been able to give them, she sees that the pay of labourers was 6d. per day, and of masons 10d. and 14d. Among the 10d. masons is the name of Smithson. But in notes below occurs the name of a "Mr. Smithson," who was probably in a superior position, such as clerk of the works. This would confirm the supposition that Robert Smithson was not the actual architect, but, in fact, clerk of the works, as he had probably been before at Longleat, in Wiltshire.

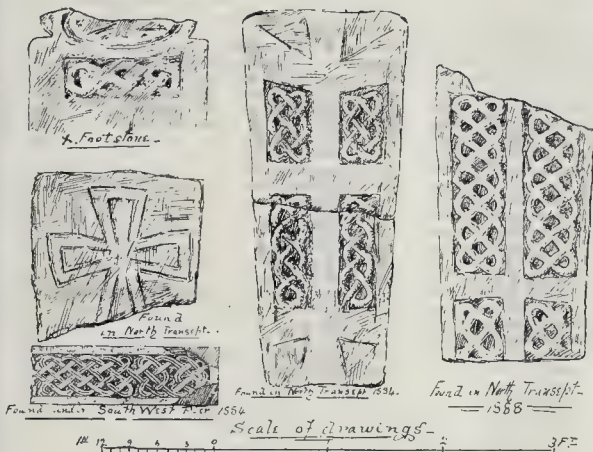
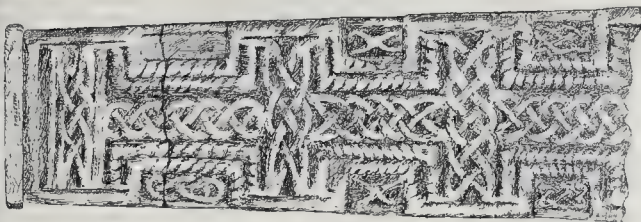
Now, if it is not detaining you too long, let us examine Thorpe's drawings a little more closely. Take, first, the plan (on fol. 29 of his MS. book). It is not named, but is identified beyond a doubt. Inside the front door are two rooms, called "Porter's lodgings." To the left is written "Gallery above, 100 fo.," and to the right, "Pantry," "Buttery," and "Kyt under and svay"; while on the central hall is written, "Sto. 52 fo.," meaning 'this story is 52 ft. high,' and "35 fo. to y<sup>e</sup> soyles (sills) of y<sup>e</sup> windos for y<sup>e</sup> hall." Outside, to the left of the house, is "Orchard heare," and at the back, "Garden heare." We shall see presently that the dimensions given on the hall were actually followed—namely, that the walls are about 35 ft. to the sills, and that the room is about 52 ft. high. Turning to the elevation, the only writing is "Woolleton, St. Francis Willoughby." The basement, as before said, is not shown at all. As a further argument that the drawing is a preliminary sketch may be mentioned the fact that to the pedestals of the lowest pilasters are shown two designs, one merely a raised panel, the other a staple and ring such as you may now see, and which, no doubt, is a feature blindly copied from Venice. The central hall is shown complete, even to the peculiar tracery of the windows, thus disposing of the theory that it is of a later date to the rest of the house. The angle turrets seem to have been an after-thought, since the corner was first drawn with quoins merely.

That the house was built by Sir Francis Willoughby is evident from the inscription over the front door, which states in two Latin hexameters that "this house of Francis Willoughby, knight, was built with rare art and left to the Willoughbys. It was begun in 1580 and finished in 1588." From an MS. book preserved in the hall, and written by Cassandra Willoughby, Duchess of Chandos, Dec., 1702, it appears that "y<sup>e</sup> master workmen which built y<sup>e</sup> House he [Sir Francis] sent for out of Italy, as also most of y<sup>e</sup> Stone Figures which adorn y<sup>e</sup> House. All y<sup>e</sup> stone which it is built with, was brought from Ancaster in Lincolnshire, by y<sup>e</sup> people who dwelt there, & who exchanged their stone with Sir Francis for his Cole, which they carried back from Wollaton, but notwithstanding y<sup>e</sup> Stone & its Carriage cost nothing but y<sup>e</sup> return of Cole which Sir Francis made for him, & y<sup>e</sup> at y<sup>e</sup> time Labourers' Wages was very small, yet it appears by a very particular account of y<sup>e</sup> Building, which still remains in y<sup>e</sup> Library, y<sup>e</sup> Building of y<sup>e</sup> House cost Sir Francis Willoughby four-score thousand Pounds." Thus, the Duchess. Compare this house and its cost with Longleat, which cost a little over 8,000l., or Loseley, which was only 1,600l.

Besides these building accounts, the muniment room contains an immense array of papers. Lady Middleton says that there are bins upon bins full of the most ancient and interesting documents, some of them written in the eleventh century, and thence marking the course of history down to early in last century. There are front doors, which stand from "Hugh de Insula to Gaifred, son of Gilbert," a receipt for jewels in the hand of Queen Philippa of Hainault; household expenses in Edward I.'s time; payments and receipts in Philip and Mary's; a letter directing how Queen Elizabeth was to be received; and letters from Indian chiefs to British officers in America. These treasures we cannot see, as they are preserved until the whole collection has been examined by the Historical MSS. Commission. And, indeed, there is not a great deal to see inside the house that meets our special requirements. For us, said Mr. Gotch, in concluding his paper, the principal charm of the house is to be found in its exterior.

The detail here, it may be added, is very rich in effect, though not always judiciously graduated in scale. So pronounced is its Classic feeling that some members would hardly believe





Saxon Remains Discovered at Peterborough Cathedral.  
From Drawings by Mr. W. H. Lord.

that he would sometimes read the service from the gallery instead of the reading-desk, so as to be able to play the *Venite* or the *Magnificat*. All the pews in the church, and the rest of its fittings, still remain just as they did in the days of the Georges, and the hand of the church "restorer" has never yet been laid on the fabric. A walk of some three hundred yards across the park, gave the party a view of the Hall, and conducted them to the site of the ancient Castle of Baginton, which has long been dismantled, and so thoroughly destroyed that not one stone is left upon another. Nevertheless, in the turf-covered mounds, Messrs. Fretton & Hartsborne were able to fix the exact points at which the walls of the *encinte* terminated, and to make out the returns; but the entire site calls for excavation and exploration by competent hands. One curious building at a little distance from the Castle is a structure which looks like a dove-cote, but of which the tradition is that it was built by one of the Bromleys, a strong Royalist, who feigned that he was partially mad, in order to save his property from the Parliamentary hands, who spared him on account of his harmlessness.

Between twelve and one the bugle was again sounded, and the signal was given for the carriages to drive on past Molslow-hill to Stoneleigh. Here, again, the first object visited was the parish church, a very beautiful specimen of Norman work combined with much work of a later date. The chancel arch and the northern doorway and porch are as fine specimens of Norman work as can be seen at such country churches as Ilfley or Shoreham, or Upton. The tympanum over the north door is curiously carved with monsters in low relief, but the mouldings of the arches, both here and in the chancel arch, are very rich and deep. The font, too, carved with figures of the twelve Apostles in bold relief, is a fine specimen of early Norman work, and Professor Clark said he thought that it might even be Saxon. It is said to have come to Stoneleigh from Maxtone, in Staffordshire. It is certain that there was a village at Stoneleigh, and probably a church also, in the Saxon days, though it was doubtless superseded by an entirely new and larger structure about the middle of the twelfth century, when the neighbouring abbey was founded. Under the Norman line of kings and down to the reign of Henry II., Stoneleigh was held in demesne by the Crown, and when, in A.D. 1154, a Cistercian abbey was founded here, and filled with brethren from Radmore, in Staffordshire, many privileges were conferred on the brethren and their abbot, among which were the right of free warren and chase, a weekly market, and an annual fair. The monastery, and with it the advowson, of the parish church were purchased from Charles Brandon, Duke of Suffolk, on whom Henry VIII. had bestowed it, by Sir Thomas Leigh, Alderman and Lord Mayor of London, whose descendants still own the estate. Hence the north aisle of the chancel has been devoted for many years to the purposes of a mausoleum for the Leighs, several generations of whom repose within it. In the chancel itself, close by, is a fine recumbent figure of the late Lord Leigh, under a decorated canopy, designed, with the entire tomb, by Sir Gilbert Scott. In the north-east angle of the chancel, also, is a large and sumptuous monument, rather heavy and ponderous in style, to the Duchess of Dudley, a lady who belonged by birth to the Leigh family. The two marble figures of the Duchess herself and her daughter Alice, both in a recumbent position, are beautiful specimens of the sculptor's art, and were much admired. The church is rich in fine monuments and quaint inscriptions. One of the latter is on the exterior wall of the south aisle of the nave. It commemorates Humphrey Howe, an old servant of the Leighs, and runs thus—

"Here lyes a faithfull friend unto the poore,  
Who deat large alms out of his Lordship's store.  
Weep not, poore people. Though that servant's dead,  
The Lord himself will give you daily bread.  
If markets rise, rail not against the rates;  
The price is still the same at Stoneleigh gates."

It may be interesting to add that this inscription has lately been recut, by the special order of Lord Leigh, to the kindness and goodness of whose house and family it bears witness. From the Parish Church the party drove by a circuitous route of two miles through the park, among some of the noblest oak trees in the kingdom, remnants of the ancient forest of Arden, and paid a special visit to one giant of the forest still traditionally known as Shak-

#### RECENT SAXON REMAINS DISCOVERED AT PETERBOROUGH.

We give an illustration of the Saxon remains, chiefly of tombstones, which have been discovered during the recent work at Peterborough. The large slab across the top of the sheet of sketches is the one last discovered (in north transept), and to which we referred, a fortnight ago, p. 97, *ante*.

The illustrations are from sketches made on the spot by Mr. W. H. Lord, of Peterborough.

#### THE LEAMINGTON MEETING OF THE ROYAL ARCHEOLOGICAL INSTITUTE.

RESUMING our account of this Congress,\* we have to record that on their return to Leamington on the evening of Thursday, the 9th inst., the archaeologists and their friends, and other persons in the town and neighbourhood, were invited by the Mayor and Mayoress to a musical *conversazione*, which was attended by about four hundred persons, and which was not over till nearly midnight. Notwithstanding this late hour, the party were all on the wing early on the following day, Friday, the 10th, for a pilgrimage to Baginton, Stoneleigh, and Kenilworth, to be made by carriages. The party left soon after ten, and reached Baginton a little before noon. Here they made their first halt at the quaint little Early English church adjoining the Park and Hall, and Mr. W. G. Fretton drew the attention of the party to the leading feature of the church, the threefold aperture between the nave and chancel. This, he said, was unique, or almost unique, in the entire country; and it was the more singular as the aperture was cut through the walls which supported the small central tower or turret which rose above the roof at the junction of nave and chancel, like the turret of a sanctus bell, only larger. He also pointed out the spacious pew belonging to the family of the squire, Mr. Davenport-Bromley, and the still more spacious mausoleum, at the east end of the north aisle, where several generations of that family repose. The tower, small as it is, contains two bells; and the organ in the west gallery, he added, was so great a favourite with the late vicar,

\* See pp. 88, 119, *ante*.

that it was not late in the seventeenth century. So also with the central block. It is so different in design, and has coloured so differently from the rest of the work, that it looks much later, and only the evidence of Thorpe's plan, and of some early views of the house, would suffice to convince some of the doubters. The church in the village of Wollaton was also visited, and the monument to the earliest recorded "architect and surveyor" was examined with interest, as well as other and finer memorials of some of the Willoughbys.

From Wollaton the party proceeded to Nottingham Castle, once a fortress, then (under Inigo Jones) made a residence; burnt down at the time of the first Reform Bill, left in ruins for years, and finally, within the last few years, converted into a museum—one of the best in the provinces. St. Mary's Church came next, a fine, spacious, and impressive building, which suffers much from the coarseness of its detail. After this a drive past the chief buildings in the town concluded the day's work, and the train carried the whole party back to the final dinner. The general conclusions arrived at were that the great places were well worth visiting, but that the smaller houses and churches were singularly devoid of detail. Wingfield, Bolsover, Haddon, Wollaton, and Ashbourne Church would, however, render any excursion notable.

In returning through Derby, and visiting All Saints' Church, it was discovered that Bess of Hardwick, on her monument, only claims to have been the builder of Chatsworth, Hardwicke, and Oldcotes. No mention is made of Bolsover, so the probability is that the account ascribing that building to her is erroneous. It would be interesting to ascertain who the actual builder was, and no doubt this could be done by a careful examination of the coats of arms which occur on the chimney-pieces and elsewhere.

**Models, Casts, &c., at Dartmouth.**—We are asked to mention that the collection of models, casts, and antique architectural collection of the late Mr. Thomas Lidstone, Diocesan Surveyor, have been placed on view by his son, Mr. J. Parnell Lidstone, and Mr. Robert Crauford.



spears oak. The party, however, were glad to leave their carriages at the entrance of the Abbey, where Mr. Fretton again "took up his parable," and commented on the leading features of the structure. What the party first saw was the original gate-house of the Abbey, which still guards the entrance to the modern mansion. It consists of a ground floor and an upper storey, containing a few rooms, now mostly disused. The old stocks, in a mutilated shape, are to be seen on the right hand as one enters. The outlines of this gateway, richly covered with ivy, are very familiar to the visitor, having been painted and photographed times without number. A large lawn, of the greenest and softest turf, now, as four centuries ago, separates the great entrance gateway from the quadrangle of the monastic buildings which the white-robed Cistercians tenanted till they were driven out by the hands of bluff King Hal. Beyond it is a rather low range of buildings, the door of which opens at once into what was a portion of the monastic cloister. One aisle, — the southern, — of the Abbey Church now forms the picture gallery; and substantially it is but slightly altered from what it was in the olden time. Close to it, in an inner quadrangle, we can see two of the fine doorways which led into the cloister, and parts of the monks' dormitory are now cut up into apartments for the servants. The only difference being that high gables have been added in the Elizabethan or Jacobean era. This portion of the original structure serves practically as a sort of vestibule to the modern mansion of Stoneleigh, — a long and imposing range of lofty buildings in the Corinthian style, reminding the travelled visitor of Chatsworth, though on a smaller scale. This part of the house dates from the early part of the last century, though it can hardly be said to be of the same type with most erections of the reign of Queen Anne or George I. The windows of the picture gallery, slightly modernised, are adorned with the Leigh arms, the doors, seats, and fittings being all formed of oak carved after ancient patterns. The pictures include, of course, a number of family and other portraits, some by Holbein, Vandyck, and other masters, and landscapes by Cuypp, Canaletti, Wouvermans, Vanderveelde, and others. The archaeologists, having passed through the "show" rooms, were taken by Lord Leigh into the private apartments, which are not usually shown to strangers, but which contain many other valuable pictures and family portraits, and are magnificently furnished in a style suited to the general design. On leaving the house, such of them as cared to explore further were led to the kitchen garden, the vinery, the moss-house, and the flower garden, with its central fountain, the conservatory, and the Italian parterre and lawn between the house and the river Avon.

From Stoneleigh, the party, having resumed their carriages, drove through the park, over the bridge across the Avon, by way of Thickborne, to Kenilworth Castle, which they were allowed by Lord Clarendon to enter, not by the usual public approach, but by the old and long disused entrance, through which Queen Elizabeth rode in state when she paid her celebrated visit here to the Earl of Leicester. Here Mr. Albert Hartshorne took the party in hand, Mr. Fretton having been their guide through all that they had seen at Stoneleigh. Crossing a field, once surrounded by out-works, now mostly levelled with the soil, and having the orchard on their right, the party proceeded under Mr. Hartshorne's guidance to the Gallery Tower, where he pointed the area of the lake, now dry, but which added strength to the castle. Then, passing along the till-yard, the scene of many a gay joust in days of old, they made their way into their inner portions of the castle, and had pointed out to them in turn Leicester's Buildings, the Privy Chamber, the Presence Chamber, the White Hall, and the great dining-hall, which, though bare and roofless, still bears in its walls, its fireplace, and the stone mullions in its windows sufficient to attest its former magnificence when Queen Elizabeth was entertained within it. From the Great Hall the visitors passed into the Inner Court, round which most of the other buildings group themselves, as may be seen by a reference to the published plans. In front of them was all that remains of "King Henry's lodgings," and "Sir Robert Dudley's Lobby," while on their left they saw the roofless walls of "The Three Kitchens," and of "Caesar's Tower." They next examined the stables, Lun's Tower, and, last of all, the Great Gate House, which was reserved for the last. They had no time to visit the

"Pleasance," the Pool, and the Garden. The Great Gatehouse, by which visitors usually approach the Castle, is the only portion of the extensive fabric which is now inhabited, or indeed habitable. The rest is a roofless ruin, open in almost every place to the heaven above, and the lofty walls and windows stand out, naked and bare, against the sky, as if they were lamenting the sad and tragic fate of Amy Robsart. The name of Kenilworth, or, as it was called in Queen Elizabeth's day, Killingworth, is made immortal beyond all other great castles by the pen of Sir Walter Scott, who has made it the chief scene of his novel called after it. To use the words of Scott, — "Of this lordly palace, where princes feasted and heroes fought, now in the bloody earnest of storm and siege, and now in the games of chivalry, all is now desolate. The bed of the lake is but a rushy swamp; and the massive ruins of the Castle serve only to show what their splendour once was, and to impress on the musing visitor the transitory value of human possessions."

According to the common account, Kenilworth Castle was built by Geoffrey de Clinton, on whom the manor had been conferred by Henry I. Having been held by two or three generations of his children, it reverted to the Crown. Henry III. bestowed the manor on Simon de Montfort, Earl of Leicester, and his wife Eleanor, the King's sister. When the earl took up arms against the King, his walls became a great place of resort for the insurgent nobles; and when Simon de Montfort was slain at Evesham, the remnant of the defeated barons rallied here, and made it the centre of their operations. In 1266 the place was besieged by the king, and the garrison had to surrender, when the king granted Kenilworth to his younger son Edmund, whom he created Earl of Leicester and Lancaster. In the reign of Edward I., while it was in the hands of that prince, Kenilworth was the scene of a splendid tournament, the knights being a hundred in number, who all, to avoid a contest for precedence, dined at a round table. The son of this earl, Thomas, was beheaded for joining in a rising against Edward II., who, however, being defeated by them, in his turn was confined here before he was taken to Berkeley Castle, the scene of his tragic end. By Edward III. Kenilworth was restored to Henry, brother of its late possessor; and John of Gaunt became its owner by his marriage with Blanche, the earl's granddaughter. When his son, Henry Bolingbroke, was supplanted by Richard II., Kenilworth reverted to the Crown; and it so continued till it was given by Elizabeth to her favourite, Leicester. Its subsequent fate is known to every reader of English history, and so need not be repeated here. Sir Walter Scott thus describes the Castle as it stood in all its pride when it was visited by the haughty Queen in 1575: — "The outer wall of this splendid and gigantic structure enclosed seven acres, a part of which was occupied by extensive stables, and by a pleasure garden with its trim arbours and parterres; whilst the rest formed the large base-court or outer yard of the noble Castle. The lordly structure itself, which rose near the centre of this spacious enclosure, was composed of a huge pile of magnificent castellated buildings, apparently of different ages, surrounding an inner court, and bearing, in the names attached to each portion of the magnificent mass, and in the armorial bearings which were there blazoned, the emblems of mighty chiefs who had long passed away, and whose history, could ambition have lent ear to it, might have read a lesson to the haughty favourite who had now acquired, and was augmenting, the fair domain. . . . The external wall of this royal castle was, on the south and west sides, adorned and defended by a lake, partly artificial, across which Leicester had constructed a stately bridge, in order that Elizabeth might enter the castle by a path hitherto untrdden. Instead of the usual entrance to the northward, over which he had erected a gate-house or barbican, which still exists, and is equal in extent and superior in architecture to the baronial castle of many a Northern chief. Beyond the lake lay an extensive chase, full of red deer, fallow deer, roes, and every species of game, and abounding with lofty trees, from amongst which the extended front and massive towers of the castle were seen to rise in majesty and beauty." On this occasion the quantity of beer drank amounted to 320 hogsheads, and the cost of the entertainments is said to have reached 1,000*l.* a day. Robert Dudley, dying at Kenilworth in 1585, it is said by poison that

he had prepared for others, left the castle and estate to his brother Ambrose, Earl of Warwick, and after him to his son, Robert Dudley, whose legitimacy he had not then publicly acknowledged; and, though Sir Robert brought forward such proofs as he thought conclusive, the castle was first seized by the Crown, and afterwards by Oliver Cromwell, who demolished it for the sake of its timber, and drained off its lake and moat. Charles II., on his restoration, gave Kenilworth to Laurence Hyde, afterwards Earl of Rochester. After this it passed by marriage to Thomas Villiers, afterwards Earl of Clarendon, in whose family it still remains.

The principal part which stands, always excepting the chief gate-house, is Caesar's Tower, a mass of Norman work, doubtless the work of the Clintons. In some places its walls are 16 ft. in thickness. Unlike most Norman towers, it has no dungeon. This massive keep was once square in plan, but the northern side of it has fallen to the ground. Sir Walter Scott conjectures that it may have derived its name from a fancied resemblance to the great White Keep in the Tower of London, which tradition identifies with the name of Julius Caesar, although he never could have built it. The Pleasance on the north-west, below Mervyn's Tower, or the Strong Tower, as it was called, was the scene of the meeting between Elizabeth and the luckless Amy Robsart. This tower will always be regarded with interest on account of the many historical associations with which Sir Walter Scott has surrounded it. Originally a very strong building of three stories, it answers very closely to the description of it which we find in "Kenilworth." "The floor of each story," he writes, "was arched; the walls were of tremendous thickness, and the space of the chamber did not exceed 15 ft. in diameter." It was here that Amy Robsart is represented as having found a brief refuge when she came to Kenilworth to make a last appeal to her husband's affection. "The reader of 'Kenilworth,'" writes the author of a local guide-book, "will scarcely require to be reminded that it was here that she wrote her letter to Leicester and fastened it with a braid of her hair in a true lover's knot; that here occurred her interview with Tressilian, and the scene with Michael Lambourne and Lawrence Staples." The upper story, which, if local tradition can be accepted, was Amy Robsart's chamber, is all in ruins.

From looking on this fair and melancholy scene the archaeologists were with difficulty called away by the inexorable bugle of Mr. Hartshorne, who had promised to conduct them to and over Guy's Cliff, passing Blacklow Hill by the way. Arriving there, they walked to the Mill to see the view down the river; then, passing through the grounds, they walked up to the house, where they were hospitably received at tea by Miss Percy. Mr. Hartshorne then conducted the party over the lower and the upper caves, and led them to the Chapel, in which stands the gigantic figure of Guy, Earl of Warwick, fixed into the southern wall. Mr. Hartshorne is no believer in the legend of Guy, and he made no secret of his scepticism on the present occasion; he also expressed his belief that although one of the upper caves may have been once tenanted by a hermit (and there are signs that such was the case), the lower cave is too low and too wet to have been the abode of any human creature. When his discourse was finished, and tea removed, the whole party drove back to Leamington in time for the evening meeting.

The papers read at the evening meeting (Antiquarian Section) were as follows: — "On the Antiseptic Vaults of St. Michon's Church, Dublin," by Mr. A. Vicars, F.S.A.; "Notes on the Parliamentary Elections for the City of Coventry," by the Rev. Dr. Cox; and a most elaborate and exhaustive paper on "The Monasteries and Conventual Buildings of Ancient Coventry," by Mr. W. G. Fretton, F.S.A. Of these papers, the first was far from acceptable to the members of the meeting, on account of the grim and ghastly subject of which it treated, and was thought generally somewhat out of place at such a meeting; though a vote of thanks to its reader was carried, still the opinion of the meeting seemed to be that it would have been far better suited to a scientific assembly. Dr. Cox's paper, like all his contributions to such gatherings, was full of amusing and instructive details; but, decidedly, the greatest favourite was Mr. Fretton's able essay, which touched on the past history of so many of the places which the Institute was to inspect under his personal



guidance the next morning. He mentioned in particular the great Benedictine convent founded at Coventry twenty years before the Conquest by Leofric, King of Mercia, parts of whose monastery are still to be seen *in situ*; its large and beautiful cathedral, the glory of the city in the Plantagenet era; St. Michael's and Trinity Churches, with their beautiful lofty spires; and St. Mary's Hall, or the old Guildhall, which was the centre of all the guild charities of the city; the Hospital in Grey Friars-lane; and the many pageants, mysteries, &c., for which Coventry was so famous. He also enumerated several of its ancient charities which have lasted, in a form more or less unaltered, down to the present day.

On the next day (Saturday, the 11th), which was fine and warm (as Thursday and Friday had been), the whole party were up early, and as soon as they had breakfasted they found themselves *en route* for Coventry by the London and North-Western Railway. The fair city of the three tall spires was soon sighted, and Mr. Fretton was waiting at the station to receive the visitors. He led them by way of Cheylesmore Manor-house to the centre of the city, showing them on their way some portions of the city walls, and several of the old narrow streets which still survive, though they are growing fewer year by year. He pointed out to them the leading features of St. Michael's Church, one of the finest parochial churches in the kingdom, with its noble spire, which had been under repair so lately that the scaffolding around it had not yet been taken down. Entering St. Mary's Hall, the party were received by the Mayor, who made to the party a speech of cordial welcome, and enumerated the chief features and historical associations of the building, including the fact that it had been for a time the forced abode of Mary Queen of Scots, who occupied at one time the Mayor's Parlour, and at another one of the rooms at the lower end of the hall,—the same in which the seals, charters, and other muniments of the city are still kept. These were exhibited, mostly under glass cases, and were very much admired, though nobody undertook to discuss them critically. Descending into the kitchen of the hall, the party saw the customary "dole" being distributed to a number of poor men, in accordance with the provisions of the will of its founder. They were also shown the lower room, used as a town prison or bridewell, and the whipping-post and stocks, and other instruments of punishment for offenders before the king's peace. The party did not leave the hall and the council-chamber without admiring the ancient arras or tapestry hung over the dais of the hall, and were told by their guide that the centre figure,—that of the Annunciation of Our Lady,—had been cut out by friendly hands, in order to save the whole piece from destruction by the hands of the Puritan soldiery. On the walls also they were shown a valuable collection of civic and royal portraits, including what is supposed to be an original likeness of Queen Elizabeth when in the hey-day of her glory, painted either just before or just after her visit to the Earl of Leicester at Kenilworth. This hall, it may be mentioned here, is about 65 ft. by 30 ft. in length and breadth, and of proportionate height; it has the original minstrels' gallery and armoury, a chair of state double in plan and grotesquely carved, and a large painted window facing the street. Although it was so often the scene of the entertainment of princes and nobles, it was till a comparatively recent date strewn with rushes. The Mayor showed his hospitality here in a practical manner by offering the party some refreshments. The party next visited the interior of St. Michael's and Trinity Churches, and walked over and round the site of the former Cathedral and the Hospice attached to it. Here they had pointed out to them the bases of two or three of the massive pillars which adorned the west front of the cathedral when it had a resident bishop. Next, the party were shown some remains of the old city walls and gates (none of the latter now in a perfect condition), and they then passed on to the Hospital of St. John, a fine old building, consisting of a nave and aisle, with an annex on the north, till recently used as a grammar-school, and lately bought by the local authorities to be utilised for church purposes of a charitable nature. The Bablake Hospital, an irregular building, with quaint, dark timbers externally, was the only other building inspected by the party before they were warned by the bugle that the luncheon hour had arrived, and that they must all repair forthwith to the Craven Arms Hotel.

Luncheon over, the archaeologists again started, under Mr. Fretton's guidance, on a second tour of exploration of the city, the first place visited by them being the Palace-yard, an old and second-rate quadrangle, so called not because it was ever tenanted by a bishop, but because it had been used as a place of honourable detention by more than one of the Tudor and Stuart princes and princesses. The architecture here is in no sense remarkable, but attention was called by Mr. Fretton to the excellent workmanship on the leaden spouts, barge-boards, and other details. From the Palace-yard the party proceeded past the site of one of the old city gates, which had been attacked, though without success, by the Royalists under Charles I., and so made their way to the Hospital of the Whitefriars, now utilised as a Union Workhouse. Here the entrance-gate, cloister, and almost all the ancient dormitory are still in use, being appropriated as sick wards, wash-houses, &c.; while another part of the old building serves the purpose of a boys' school. Here the archaeologists made a halt, and, seeing that their presence, headed by a bugler, caused some sensation among the inmates, and also no little pleasure, passed round a hat among their party, and collected 24. 6s. 6d., which the master of the workhouse promised to distribute in pipes for the old men, tea for the old women, and cakes and other treats for the children. The other places inspected in the course of the afternoon were St. Anne's, or the Carthusians' home; the Grey Friars, now known as Christ Church; Ford's Hospital (one of the quaint old quadrangular buildings of the same type as Leicester's Hospital at Warwick, and still tenanted, as it was three centuries ago, by "bedesmen"); and, lastly, sundry portions of the city walls near Cheylesmore Manor, where they ended their circuit of inspection very much as and where they had begun it.

In the course of their peregrinations round Coventry, the party were of course shown the picture of the Lady Godiva in the Mayor's Hall, and the well-known figure of "Peeping Tom" on the face of a house in Hertford-street, and a rival Peeping Tom on the hotel opposite; but they had learned from Mr. Bloxam that the peasant of Lady Godiva, which Tenyson has rendered immortal in verse, cannot be traced for its origin farther back than the reign of Charles II.

Coventry is eminently "a city with a history." Before the Conquest, it was under the rule of a Saxon earl, and after that event the lordship of Coventry passed by marriage to the Earls of Chester, under whom it prospered greatly. The Earls of Chester were succeeded by the Montalts and the Arundels, and through failure of heirs it devolved on the Crown. When Edward III. made his son, Edward the Black Prince, Duke of Cornwall, the king annexed the manor, under the name of Cheylesmore, to the dukedom for ever. In 1344 the town received from the same king a charter of incorporation; the great annual fair, however, is of still earlier date, having been granted by Henry III. so far back as 1218. In 1397 the city was the scene of the famous hostile meeting between Henry Bolingbroke, Duke of Hereford (afterwards Henry IV.), and Thomas de Mowbray, Duke of Norfolk, a meeting which has been immortalised by Shakespeare in his "King Richard II." King Richard and a great army of his nobles were present on the occasion. When the champions were about to engage, the king suddenly interfered, and banished them both from England, Norfolk for life, and Hereford for a term of years. This meeting took place at Gosford or Gosforth Green, an open spot about half a mile from the city walls, which was pointed out to the archaeologists by Mr. Fretton. In 1404 King Henry IV. held in the great Chamber of the Priory here a Parliament, afterwards known as *Parliamentum Indoctorum*, on account of the exclusion of all lawyers from its lists. "Coventry" (writes Mr. Black) "received many marks of favour from Henry VI. and his queen, who both frequently visited it, and it was this king who formed this city and the surrounding district into a separate county, and gave it a charter enacting that the bailiffs of the city should be also sheriffs of the county, and that the same coroner should preside over both. A second Parliament was held at the Priory in 1459, and this was called *Parliamentum Diabolicum*, from the number of attendants passed by it against Richard, Duke of York, and other persons." For the support which its citizens had given to Henry VI. in the struggle which ended in his dethronement and death,

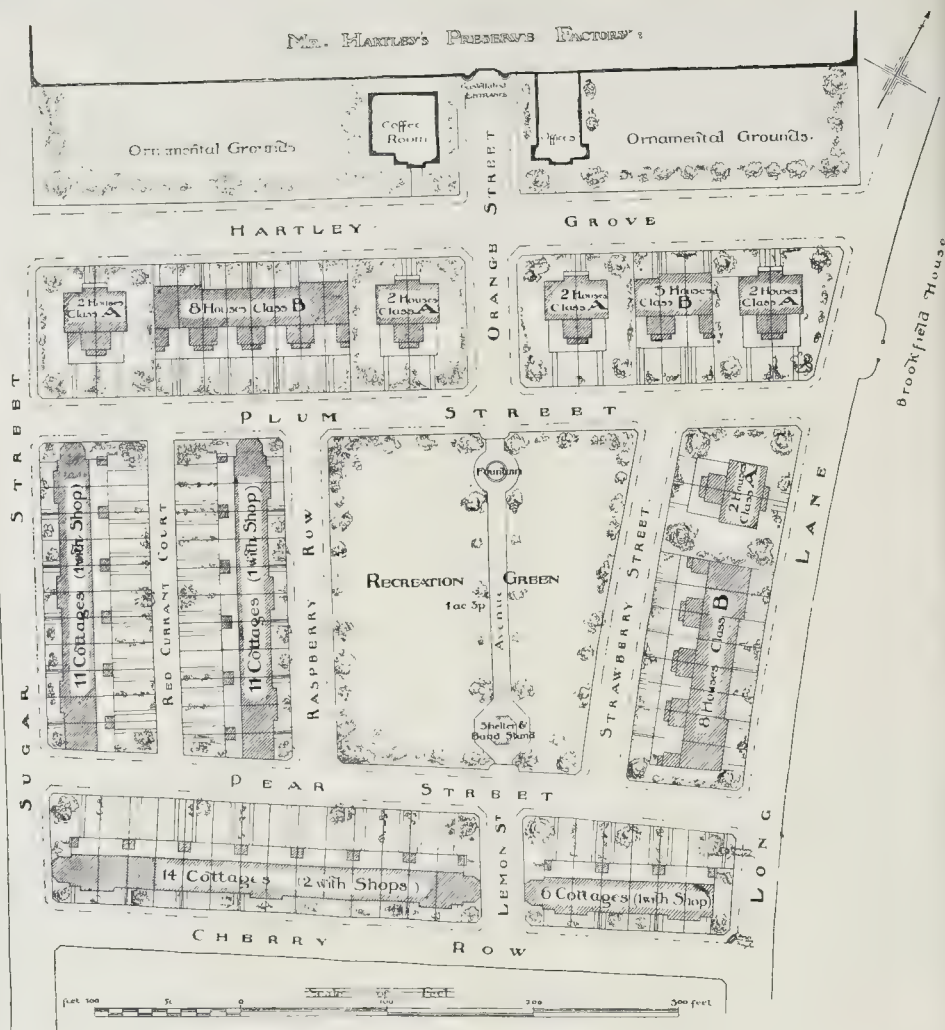
they were severely fined by Edward IV. On the defeat of Richard at Bosworth, in 1485, King Henry VII. was received with great joy at Coventry, the townsmen voting him a cup and a subsidy of 100*l*. Queen Elizabeth visited the city in 1565, when she was splendidly entertained by the mayor in the Guildhall. In the next year, and again in 1569, Mary Queen of Scots was kept a prisoner here for some time in a house which was afterwards the Bull Inn. In 1616 her son, James I., paid a visit to Coventry, where he was entertained at a grand feast. Coventry, however, sided with the Parliamentarians in the Great Rebellion, and in consequence its walls were almost entirely dismantled on the accession of Charles II. The walls, we are told by Mr. Black, were three miles in circumference, and 9 ft. thick, and had thirty-two gates and towers; and they were strong enough to admit of the citizens bidding defiance to the king's forces on more than one occasion. It is stated on the same authority that no fewer than 500 men were employed for twenty-four days on the work of dismantling these walls. It only remains to add that Coventry is especially rich in charitable foundations, and that many of these, with an income in all of more than 4,000*l*, though of ancient date, survive to the present day.

It would be impossible, within the limits at our disposal, to give anything like a full description of this most interesting city. We can only remind our readers of the fact that its Benedictine monastery was the scene of several early Parliaments, and that the White Friars' monastery, mentioned above as being now converted into a workhouse, was founded about the middle of the fourteenth century, and that its cloisters are among the finest specimens remaining of the Edwardian era. The third of the tall spires of Coventry, that of Christ Church, is all that remains of the old Grey Friars, and early in the present century it stood in a farmyard, and was used as a piggyery before the new church was built on to it. St. Michael's Church was pronounced by Sir Christopher Wren to be a masterpiece of Gothic art. Unlike most Mediaeval churches, its spire is its oldest part, having been completed in 1395. Its spire rises above 300 ft. from the ground. Henry VI. in 1450 heard mass here, and presented the parish priest with an altar cloth of gold, which probably did not escape the hands of Henry VIII. The large interior of the church is accounted for by the fact that nearly every guild in Coventry had a chapel within its walls, and that the church was designed to hold them all. The fabric has been lately repaired throughout (we will not use the term "restored"), the galleries and pews swept away, and many of its windows have been filled with stained glass; but, in the opinion of the archaeologists, neither here nor in the other churches in Coventry is the new stained-glass a great success. One of the windows was put up to the memory of the Prince Consort, and others commemorate local celebrities. The church contains also a few monuments and some old carvings in oak, but these are not of great interest or merit; it has, however, one of the finest peals of bells in the kingdom. The restoration of its spire was completed only last month, when the vane on its top was replaced; and the scaffolding is now gradually disappearing.

Trinity Church is a very noble structure, but it suffers from being placed so close to St. Michael's that they stand in the same churchyard, and in the past it has also suffered from injudicious and tasteless restorations. The original spire was blown down in 1664, and was rebuilt in the course of three or four years, on the ancient lines, of course. Among the monuments which this church contains is one to the memory of Dr. Holland, the first translator of Camden's "Britannia," and this was pointed out to the archaeologists. St. John's or Bablake Church is of the Edwardian period, having been erected by members of the Guild of St. John in 1340-50. On the union of St. John's Guild with that of the Holy Trinity, it became the joint property of the two, and so continued down to their suppression by Henry VIII. It was made a parish church in 1734, by Act of Parliament. It is cruciform, with a battlemented tower, turreted at the angles. Its finest window and handsome font,—the latter said to be a copy of that in St. Edward's Church at Cambridge,—were much admired. The third of "the three tall spires" of Coventry is that of Christ Church, which stands on the site of the old Grey Friars, as already mentioned.

But its churches were by no means the only





Proposed Model Village at Aintree, Liverpool.—General Plan as Laid Out.

structures in Coventry which delighted the members of the Archaeological Institute. Many of the old houses, with their projecting bargeboards and timbered fronts, still wear the same appearance, to all intents and purposes, as they did in the days when Coventry was, as it has been called the "Chamber of Princes," when, as Mr. Black writes, Richard II. and his gallant army visited it just before his fall, when Margaret of Anjou and her husband Henry were entertained in the Priory, and went in royal state to St. Michael's Church; and when England's kings and queens loved to resort to Coventry in order to find relaxation in its plays and pageants. The party could not have walked through the streets of the fair old city without some feeling of sadness arising from the thought that, in spite of its modern manufactures, the city had "seen better days," and they left these buildings with much regret that they could not have devoted a second day to the many relics of former greatness by which they were surrounded on every side. They returned home to Leamington in time for dinner, and for the meeting of the Antiquarian Section, over which Mr. J. T. Micklethwaite, F.S.A., presided, and in which

three papers were read. These were as follows:—"Shakspearian Ballads and Songs," by Mr. Walter Rowley; "On Dovecoats in Churches," by Mr. J. T. Micklethwaite, F.S.A.; and on "Houses of the Elizabethan type," by Mr. J. A. Gutch, architect, of Kettering. The last-named paper (which, in the absence of its writer, was read by Mr. Edward Walford) contained much quiet humour and criticism on the ways and habits of the later Tudor era. The paper was a condensation from one by the same author on "English Homes in the Seventeenth Century," read before the Architectural Association nearly three years ago, and which was printed *in extenso* (with several plans of houses by John Thorpe) in the *Builder* for December 26, 1885. All three papers gave rise to brief discussions, in which the Rev. Dr. Cox, Mr. Lambert, Mr. Micklethwaite, Mr. E. Walford, and others took part; and they had each and all accorded to them a hearty vote of thanks.

On Sunday, August 12, most of the members of the Institute attended public worship at the Parish Church.

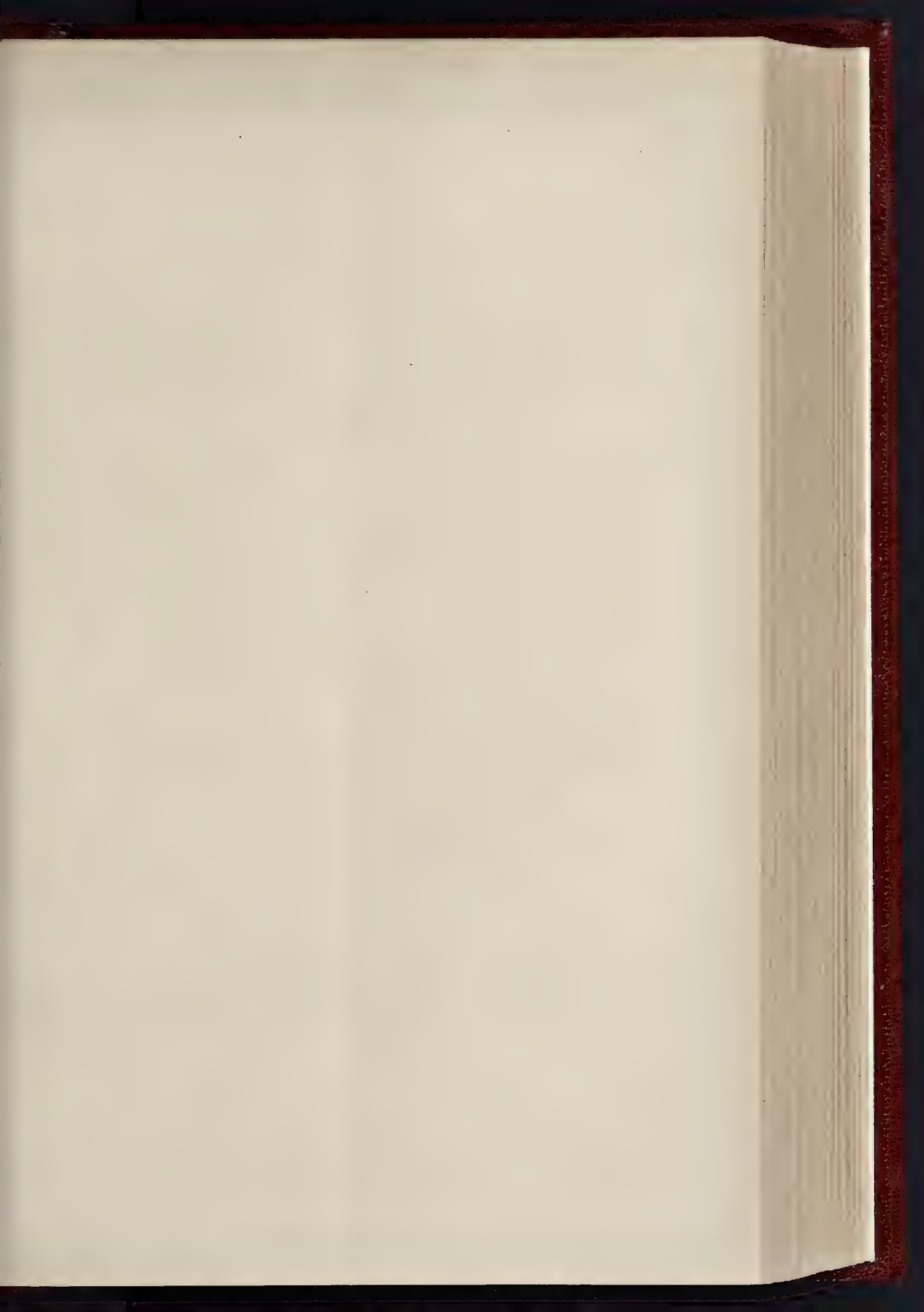
We will conclude our account of the Congress next week.

### Illustrations.

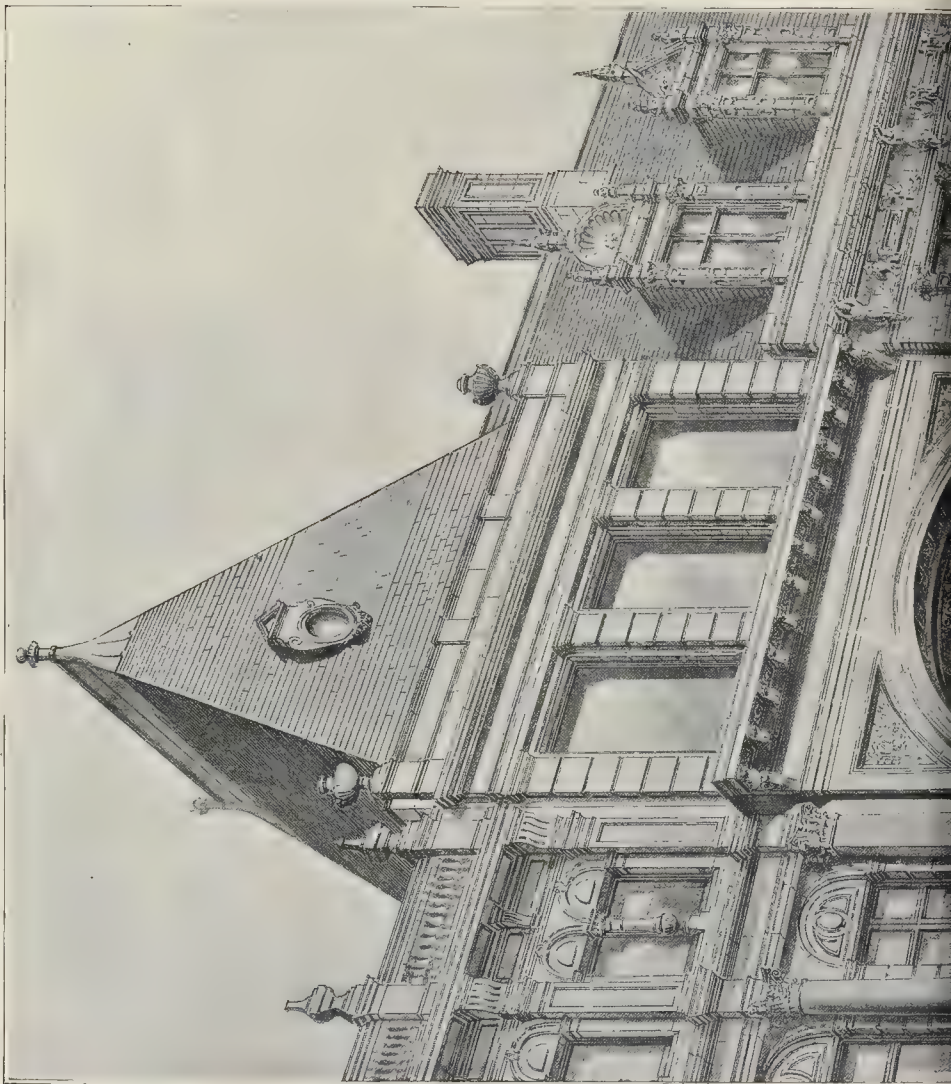
#### NEW BUSINESS PREMISES, CHARING-CROSS-ROAD, W.C.

THESE offices and show-rooms, which have been erected for Messrs. James Hinks & Son, lamp manufacturers, comprise basement, ground, first and second stories, which are lofty and well lighted. In the basement is the glass store, where racks are provided for chimneys, globes, &c., the front portion being partitioned off to form a packing-room, which has a separate staircase and skid-way-lift arranged in the front area. Upon the ground floor and on each side of the entrance lobby, which is enclosed with mahogany screens, are the manager's and clerks' offices, the latter in communication with the warehouse at the rear. Approached from the entrance lobby by a mahogany staircase is the show-room, which occupies the whole of the first floor. The front portion is lighted by a large elliptical-headed window towards the street, which gives the outline to the wagon-headed ceiling. The back portion of the room

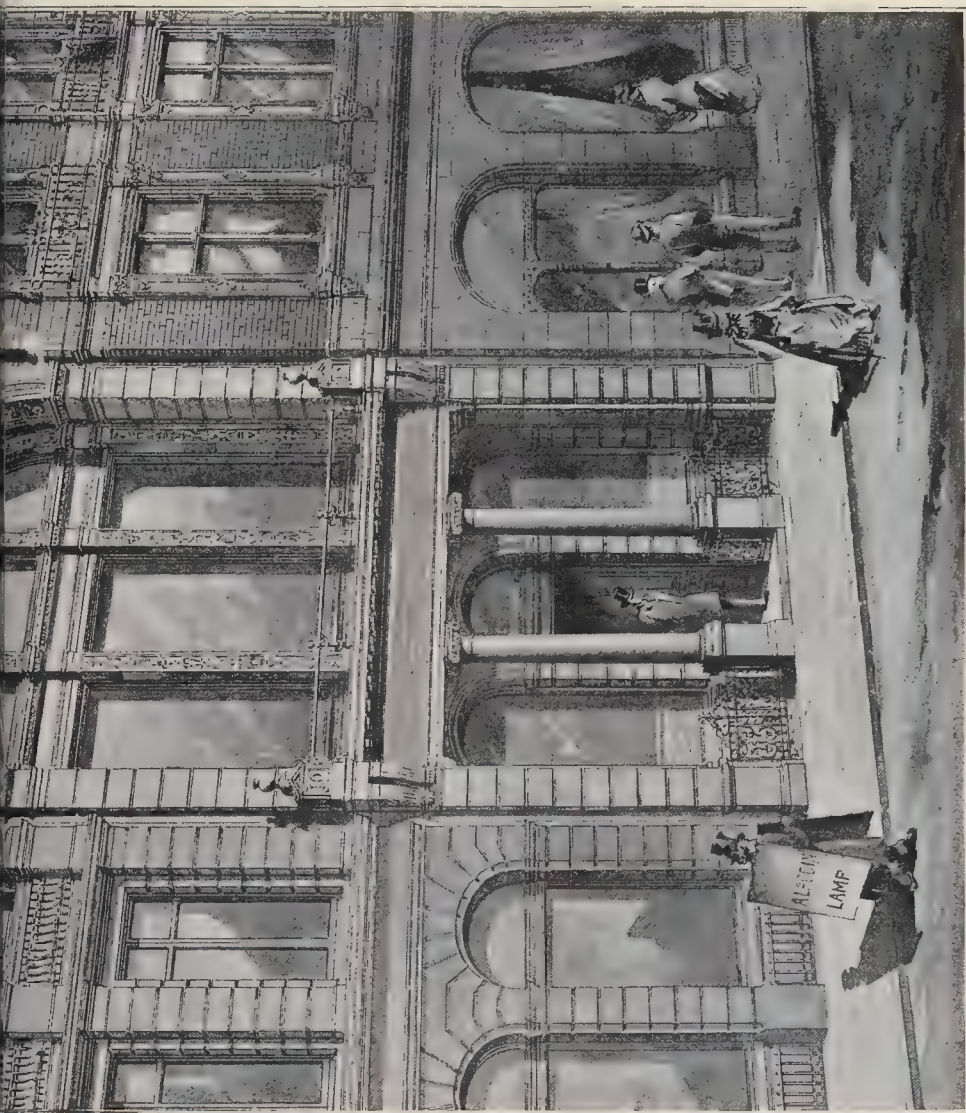




THE BUILDER, AUGUST 25, 1886.





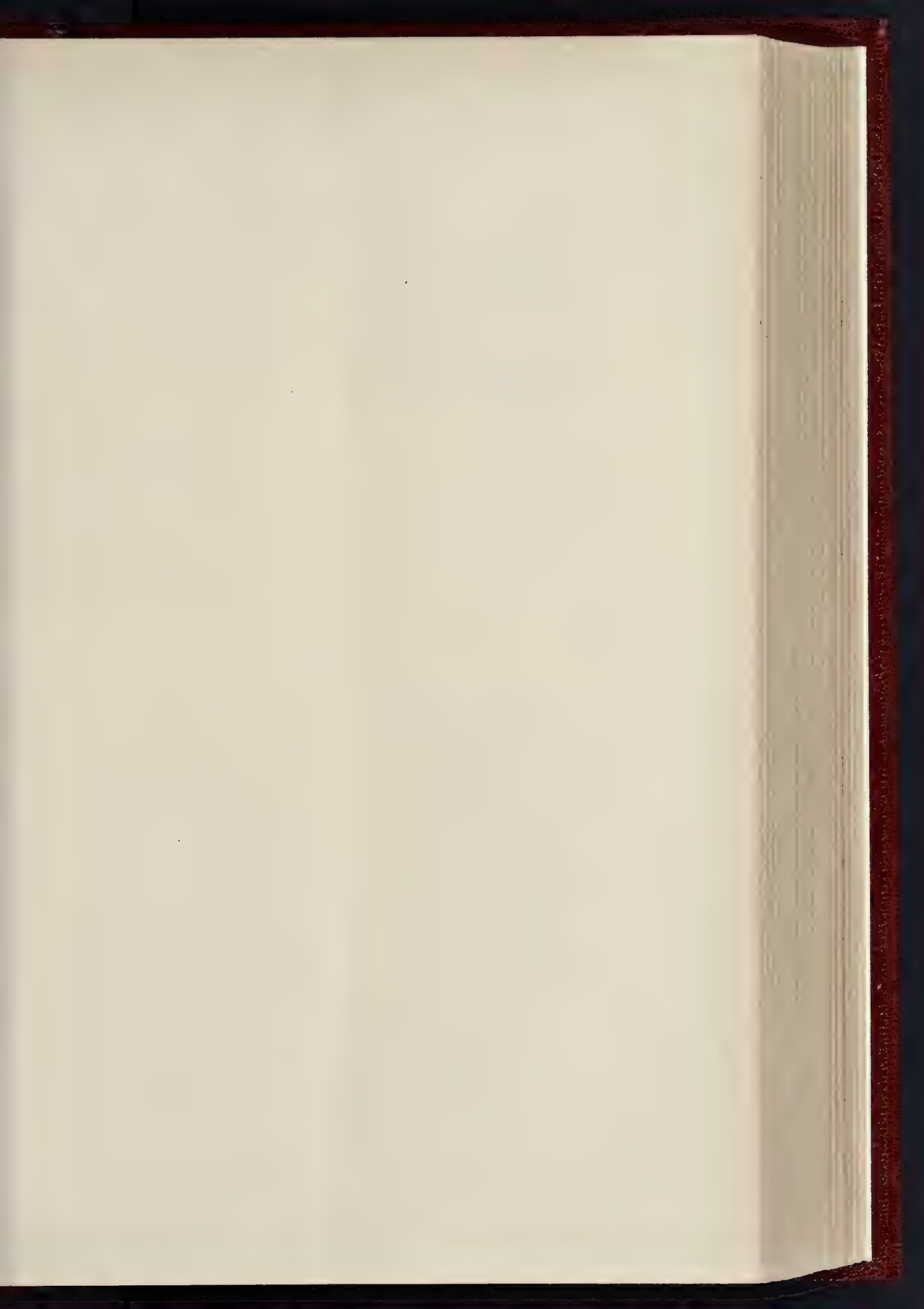


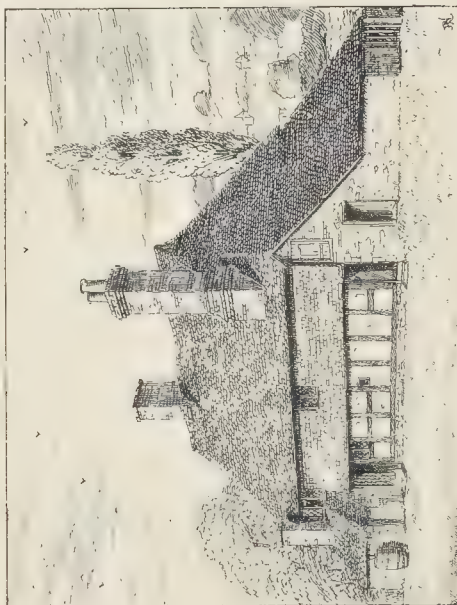
The Phototype Co., 36, Strand, London.

BUSINESS PREMISES, CHARING CROSS ROAD.  
MESSRS. BATEMAN & BATEMAN, ARCHITECTS.





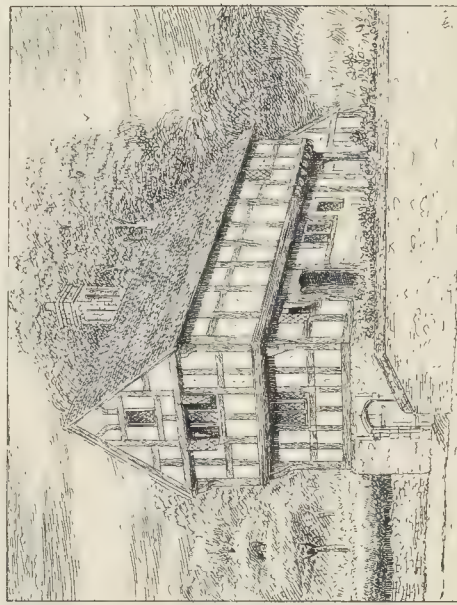




AT COMPTON



AT LITTLETON

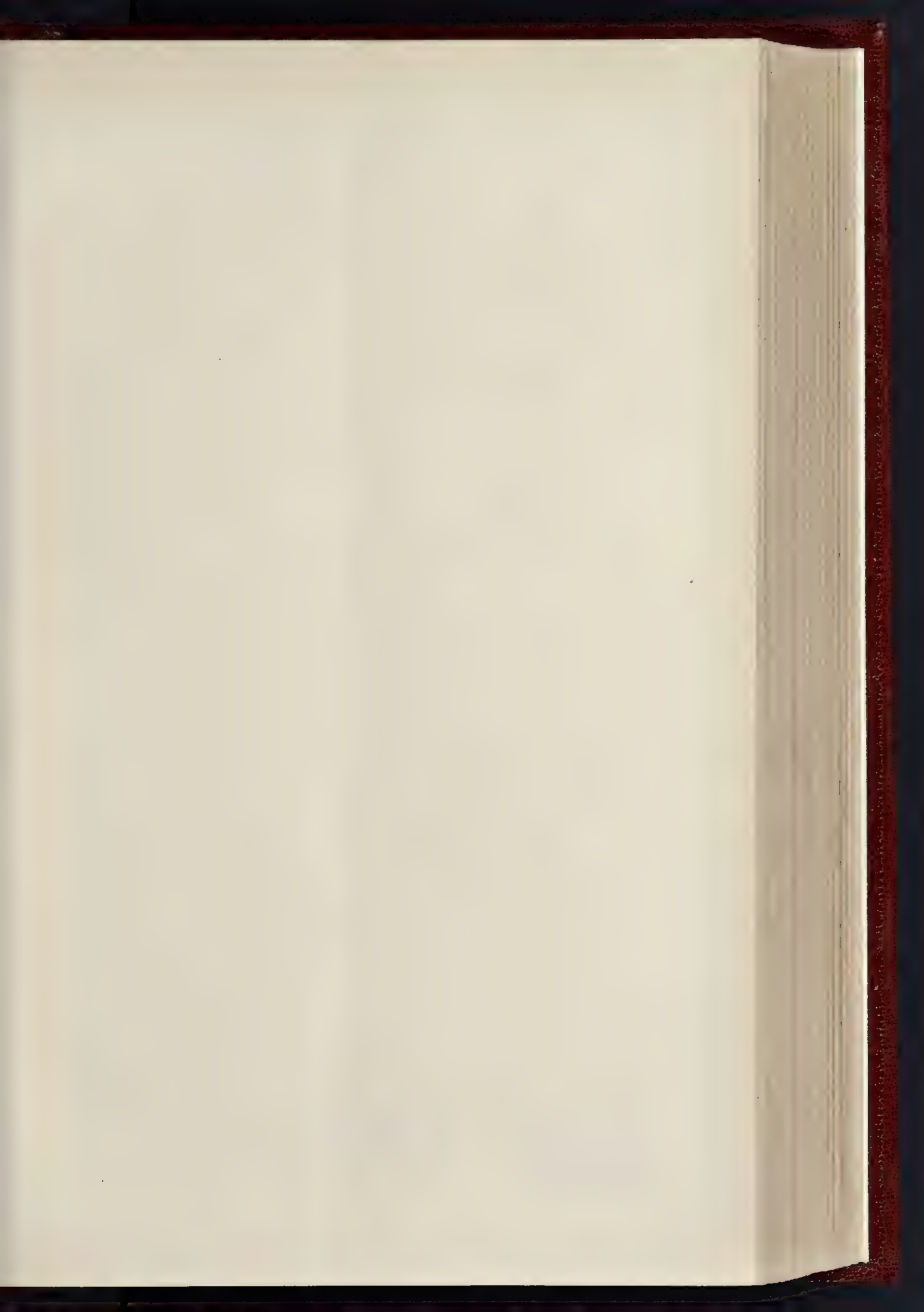


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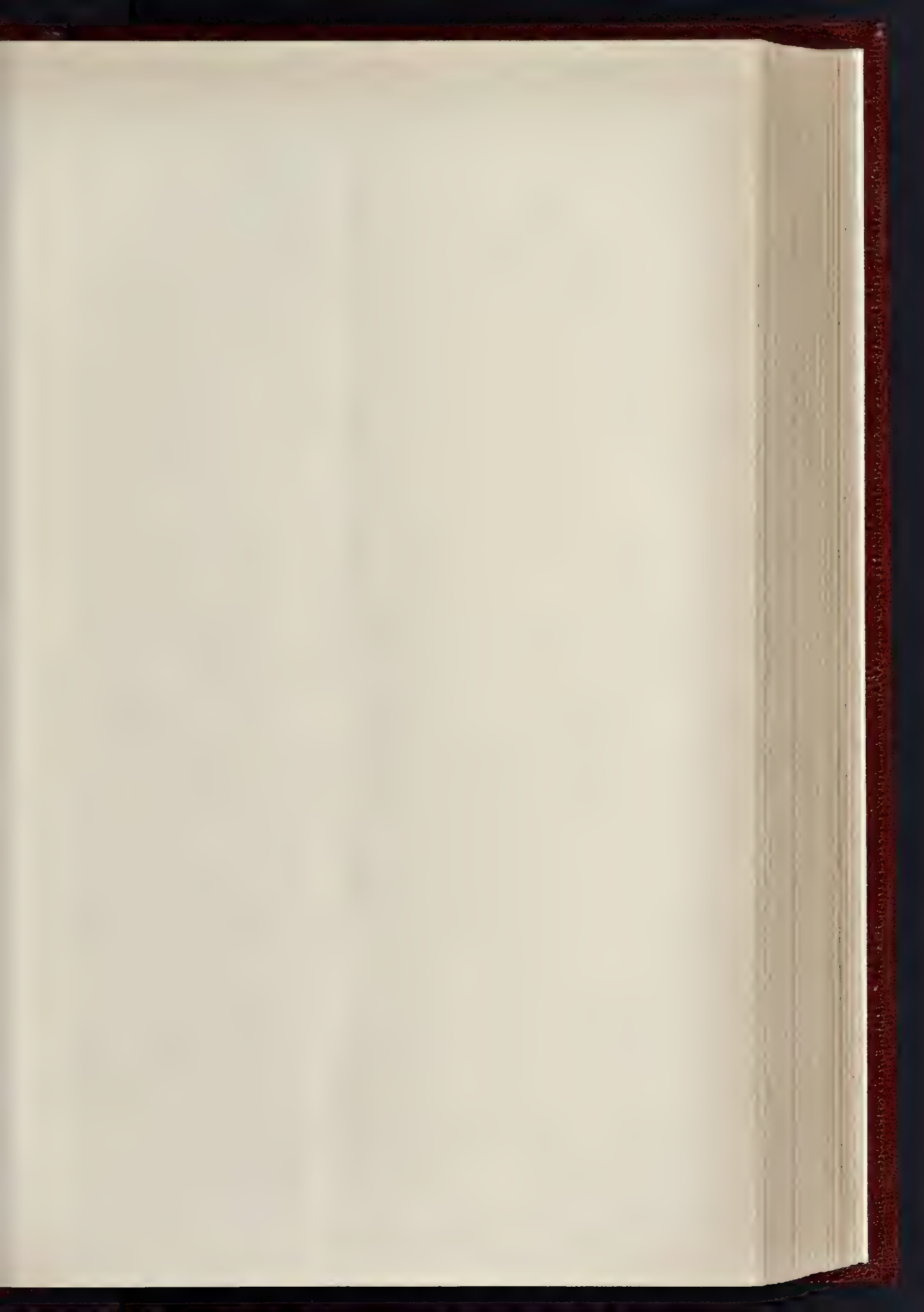




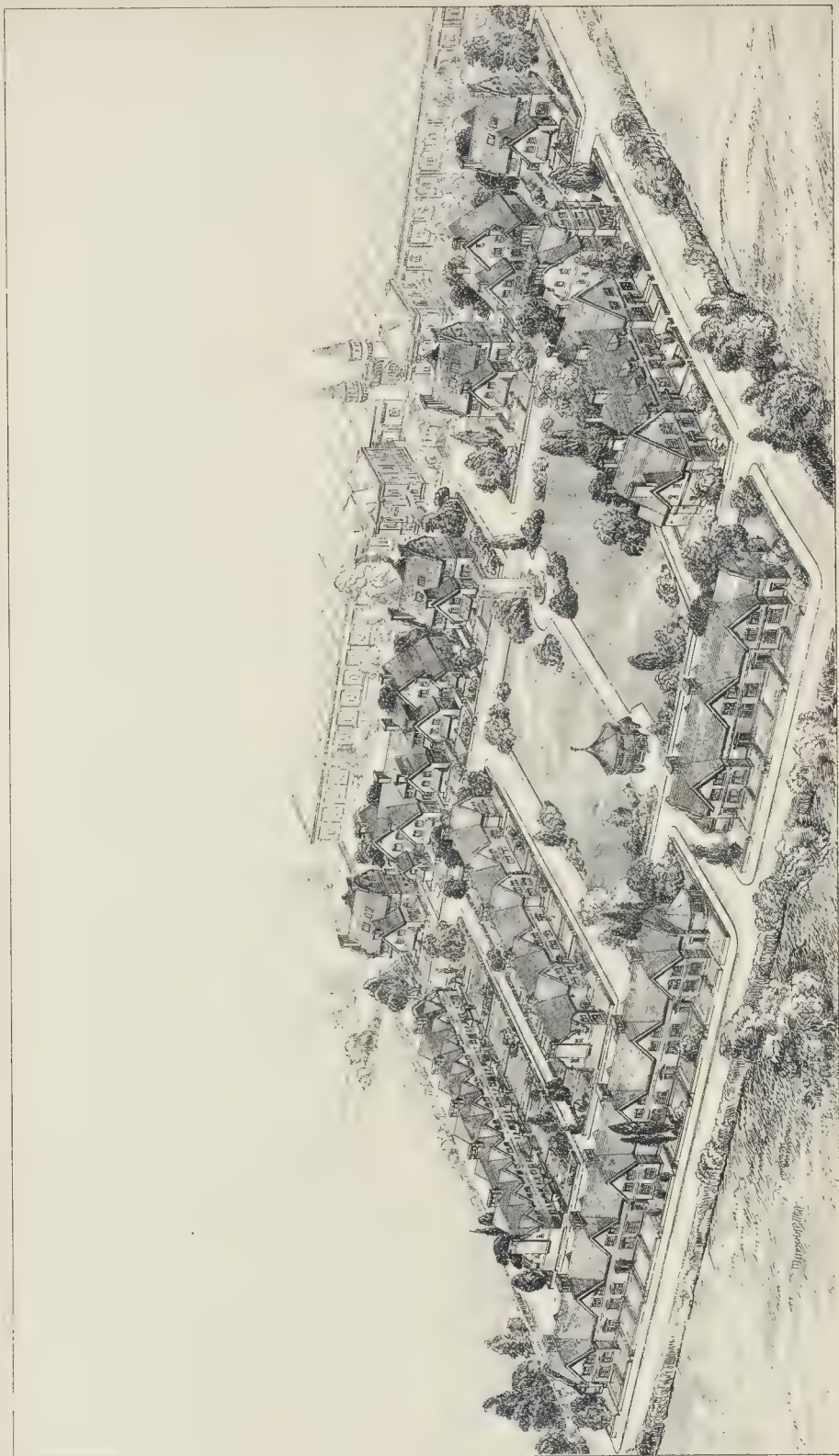


WINDOW, ST. JAMES CHURCH, PICCADILLY—EXECUTED BY MESSRS. WARD & HUGHES





THE BUILDER, AUGUST 25, 1889.

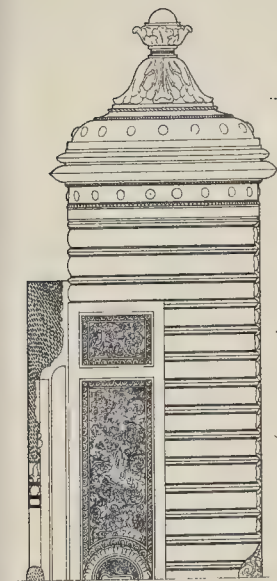


W. SUGDEN & SON, ARCHITECTS, LONDON.

FIRST PREMIATED DESIGN FOR MODEL VILLAGE AT AINTREE.—MESSRS. W. SUGDEN & SON, ARCHITECTS.

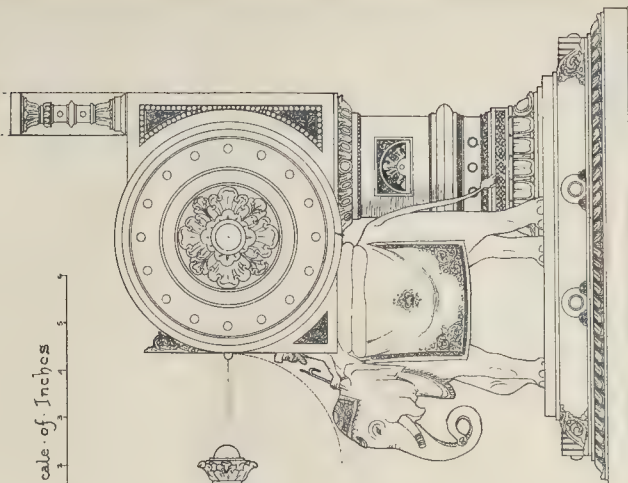


Designed by.  
 W<sup>m</sup> R. F. Chisholm, F.R.S.B.



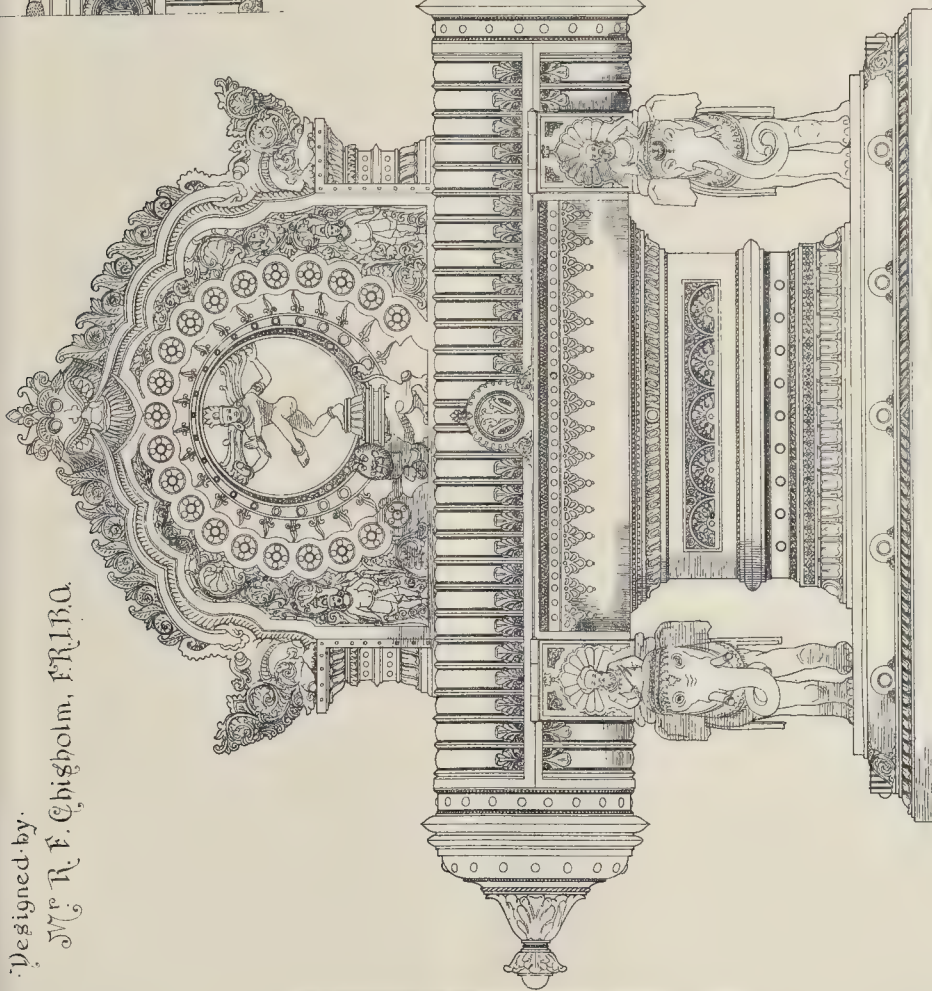
Plan of Top.

Scale of Inches



Side Elevation.

PHOTO. BY SERRAUS & CO. 22 MARK LANE. LONDON. E.C.



Silver-Gilt. Casket. set with pearls & precious stones.







WINDOW, ST. JAMES' CHURCH, PICCADILLY.—EXECUTED BY MESSRS. WARD & HUGHES.







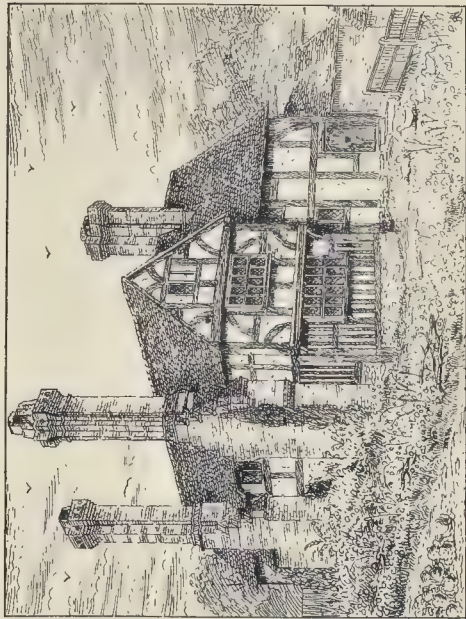
AT BINSCOMBE.



AT FARNCOMBE



AT BINSCOMBE



UNSTEAD MANOR.

PHOTO BY THE SURNAME & CO. LTD. 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.





is covered and lighted with a semi-circular lantern, glazed with toned glass. A small show-room is provided on the second floor in the front.

The elevation to Charing Cross-road has been executed in Portland stone. The panels in the mullions of the show-room window have been carved by Mr. Frampton, and the roof is covered with Westmoreland green slates. Messrs. Sage & Co. have fitted up the show-rooms. Messrs. Clark, Bonnett, & Co. supplied the lift and revolving shutters, and Messrs. Hayward Bros. & Eckstein the pavement lights, a considerable number of which are used on the show-room floor to light the warehouse beneath. The heating apparatus was fixed by Messrs. Haden & Co., and Messrs. Verity Bros. supplied the grilles to the front. Messrs. Adamson & Sons, of Ealing, were the general contractors. Mr. Haylock acted as clerk of works; and Messrs. Bateman & Bateman, of Birmingham, are the architects. The outlay has amounted to about 6,000*l*.

#### DESIGN FOR MODEL VILLAGE, AINTREE.

WE publish a bird's-eye view and a plan of the premiated design in the competition for a "model village" for the employés of Mr. Hartley, proposed to be erected at Aintree, near Liverpool, on the site of what was formerly known as Reynolds's farm, as mentioned already in our columns (p. 16, *ante*). The design is by Messrs. W. Sugden & Son, architects, of Leek.

The plan includes a recreation-green of a little over an acre in extent, across which most of the cottages look. The architects have endeavoured, in the arrangement of the village, to obtain a certain degree of picturesque effect without eccentricity, and have designed the cottages in conformity with the old domestic buildings indigenous to the district, and avoiding all flimsy and supposed "picturesque" ornamental additions, for which they are entirely to be commended.

The dwellings are laid out in rows to bear severally the names of "Hartley Grove," "Long-lane," "Cherry-row," "Sugar-street," and "Raspberry-row," and include in all seventy-one houses. The remainder of the information in regard to the scheme we reprint directly from the report sent in by the architects with their drawings:—

"The smaller cottages each comprise the following internal accommodation:—On the ground-floor—living-room, 15 ft. 3 in. by 12 ft. 6 in.; kitchen, 13 ft. 9 in. by 7 ft. 6 in.; pantry (sunk 1 ft. 6 in. in ground), 7 ft. 6 in. by 4 ft.; entrance and store under stairs. On the chamber floor—parents' bedroom (large enough to contain an extra bed for children), 18 ft. 3 in. by 9 ft. 6 in.; girls' bedroom, 9 ft. by 10 ft. 6 in.; and boys' bedroom, 8 ft. 9 in. by 8 ft.

The twenty-two larger cottages, where the projected gables relieve the long frontages, have the addition of a bay 3 ft. by 9 ft. 6 in. to living room and to parents' bedroom over.

The five shops suggested to be attached to the cottages at the main ends of the blocks are each 16 ft. 3 in. by 11 ft. If preferred, an additional bedroom might be secured over each shop.

The principle of plan of these cottages has much in common with that so largely adopted by the London and North-Western Railway Company at Crewe, for the use of their workmen.

The larger houses of Class B contain each the following accommodation:—On the ground-floor, living-room, 14 ft. by 13 ft. 3 in.; parlour, 12 ft. by 12 ft. 6 in.; scullery or kitchen, 8 ft. by 8 ft. 6 in.; pantry (sunk 1 ft. 6 in.), 8 ft. 6 in. by 3 ft. 6 in.; entrance-lobby, store under stairs, &c. On the chamber floor, parents' bedroom, 12 ft. by 16 ft. 6 in.; girls' bedroom, 10 ft. 6 in. by 14 ft.; and boys' bedroom, 8 ft. 6 in. by 12 ft.; two closets, &c.

The somewhat smaller houses of Class B have the following altered dimensions, viz.:—Living-room, 12 ft. by 13 ft. 6 in.; parlour, 11 ft. by 12 ft. 9 in.; parents' bedroom, 11 ft. by 16 ft. 9 in.; girls' bedroom, 10 ft. 9 in. by 12 in.; all other dimensions as before.

The houses of Class A have each the following accommodation:—On the ground-floor, living-room, 12 ft. 3 in. by 16 ft. 6 in.; parlour, 12 ft. by 12 ft. 6 in.; scullery or kitchen, 8 ft. 6 in. by 8 ft.; pantry (sunk 1 ft. 6 in.), 8 ft. 6 in. by 3 ft. 6 in.; entrance-lobby, passage, store, &c.; on the chamber and attic floors, principal bedroom, 12 ft. by 18 ft., with bay, 7 ft. 6 in. by 2 ft. 9 in.; bedroom, 12 ft. 3 in. by 13 ft. 9 in.; ditto, 15 ft. by 13 ft. 9 in.; ditto, 14 ft. 9 in. by 9 ft.; back bedroom or bathroom, 8 ft. 6 in. by 9 in.; chamber water-closet, closet, &c.

If the requirements of the class of tenants for these houses demand it, the kitchen may be enlarged to enable the living-rooms to be used as secondary sitting-rooms.

The cubing of the smaller cottages is 8,516 ft.,

which at 3*d*. per foot (a price at which we have seen similar blocks erected\*) amounts to 106*l*., leaving the balance provided for formation of yard, w.c., &c.

The somewhat larger cottages, where gables are projected, are one-seventh larger, about, which would make them cost about 16*l*. each more than the others.

The cubing of the smaller-class B houses is 10,940 ft., which at 3*d*. per foot (a sufficient price where so many similar buildings are to be erected), amounts to about 160*l*., leaving the balance of 175*l*. provision for the cost of coal-stores and yard, &c. We are of opinion they might be erected under favourable circumstances at 3*d*., which brings cost at 150*l*., exclusive of yard, &c. The large houses of class B, where gables project, would cost from 16*l*. to 20*l*. more than the others.

The cubing of the Class A houses is 16,800 ft., which, at 3*d*., amounts to 245*l*. each, exclusive of yard.

The building materials contemplated to be used by our design are the whitish-red local bricks for body of walling, with deep red sanded quoins and moulded strings, &c. All roofs covered with hipped Staffordshire or Broseley tiling: all sashes painted white.

If permitted by the local authorities, the streets of the village might be reduced in width and cost, or substituted by asphalted or concrete roadways."

The following is a summary of the accommodation provided by the plan:—

|                     | Houses<br>Class A | Houses<br>Class B | Cottages |
|---------------------|-------------------|-------------------|----------|
| Hartley-grove ..... | 8                 | 11                | 0        |
| Long-lane .....     | 2                 | 8                 | 0        |
| Cherry-row .....    | 0                 | 0                 | 20       |
| Sugar-street .....  | 0                 | 0                 | 11       |
| Raspberry-row ..... | 0                 | 0                 | 11       |
|                     | 10                | 19                | 42       |

Total, 71, or within 10 per cent of the maximum fixed by the conditions. The five shops attached to cottages might, the authors say, be made into five extra cottages if preferred, raising the number of cottages to 47 and the total number of houses to 76.

The view which we publish is from a drawing by Mr. W. H. Sugden.

#### DESIGN FOR A SILVER-GILT CASKET.

THIS illustration is from a drawing which has been sent to us from India by Mr. R. F. Chisholm, the well-known Anglo-Indian architect, and which we understand to be a design by himself in the style of Hindoo Decorative work.

As Mr. Chisholm, who is in India at present, has given no further information as to the intention, material, &c., of the work, we can only give it as an example of the work of an English designer using Indian forms, which Mr. Chisholm appears to have succeeded in assimilating with considerable success.

#### WINDOWS IN ST. JAMES'S CHURCH, PICCADILLY.

THE stained-glass window in the north gallery, the second from the east end, is in memory of the late Mr. Westley, of Regent-street, and represents as its chief subject the healing of blind Bartimeus by Our Lord, and under it a smaller one of a similar incident, the healing of the two blind men by Our Lord at Capernaum. The subjects are framed by borders and canopies of the Renaissance character in harmony with the style of the church. The window next to the east end has the principal subject, the raising of Lazarus, and beneath it is a small subject of Our Lord meeting Mary and Martha. This window is intended to commemorate the bi-centenary of the consecration of the church. Both windows are by Messrs. Ward & Hughes, who have aimed at avoiding the conventional character of Medieval painted windows, and also the idea of a picture on glass.

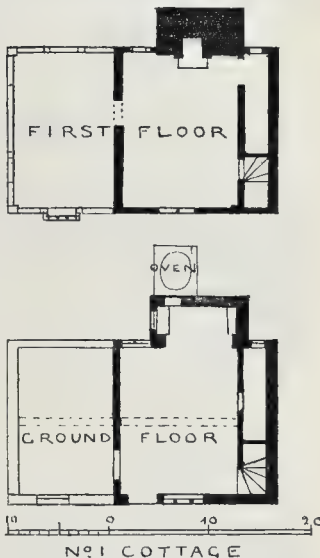
#### OLD COTTAGE ARCHITECTURE.—IV.

THE original plan of the oldest cottages was a simple parallelogram containing one room on the ground floor and one on the upper floor. Some of these still exist in out-of-the-way places, though it is seldom that they have not been added to and altered. Every day the number of those in their old state gets smaller and smaller.

I am able to give two plans of cottages near Blackheath, on what was, till recently, the Grantley estate, which had remained very much unaltered in an out-of-the-way nook, until I had to repair and enlarge them for their new owner.

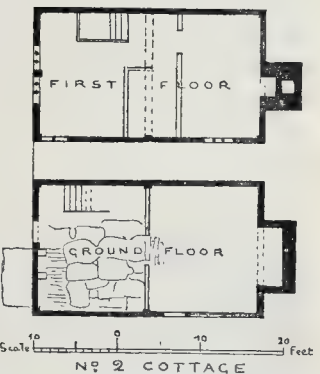
\* This seems cutting it rather close.—Ed.

No. 1 Cottage is of the smallest shape, and retained, as is rare, its original winding staircase. At an early date the part unblackened was added to this. The oven is probably also an addition. I have never in any old house or cottage found an oven that could be determined as of the same date as the fireplaces. The openings and brickwork are generally clearly additions, and the flues either taken up separately



or into one of the old flues. As in houses of importance there were always two flues to the large fireplaces, this was the more easily managed. Probably the manufacture of bread was different, or the large houses had a separate bakery which supplied the cottages on the estate, and the lord still remained the "loaf-giver." The arrangement of the partition in No. 1 cottage, which gives the cupboards on each floor, also enabled a smaller girder to be used; and the size of girders (which in oak is limited) naturally in great measure dictated the size of the rooms. This cottage contains the usual large chimney opening, with seats of later date. The opening, as is usual in all but the best work, is crossed by a large chamfered oak beam. In good houses the first-floor fire-places, being of smaller span, are generally formed of a Tudor arch in brick; but in humbler buildings and garrets an oak beam is used. In some cases also the oak fender-curb also remains, and in that case the hearth is made up level with the top of the curb, and lies on the top of the beams and joists. In these cottages, however, the joists are trimmed for the hearths.

No. 2 Cottage has a larger plan, being in two

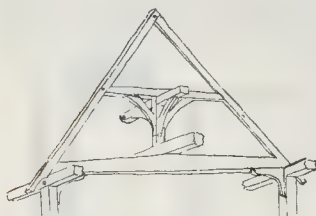


bay. It has at later date been divided up on each floor, but certainly the upper, and probably the lower partitions, are not original.

The staircase was in a straight flight—a form of later date and of later detail, and, from the



fact that the fireplace on the ground-floor is out of the centre, I think probably there was here an arrangement of newel stairs and cupboards on one side, similar to that of No. 1 cottage. The unusually elaborate nature of the framed truss seems to point to an earlier date



than usual, and it seems that the chimney, which is built independently of the structure, was added afterwards. On the first-floor of this cottage remains one of the open, unglazed windows usual enough in the older cottages, but not often found still remaining, except in barns and stables. They were formed by stanchions set diagonally and framed between the posts, and were closed with shutters.

One half of the ground-floor of No. 2 cottage retained what was probably its original flooring of rough slabs of Horsham stone, fitted together like a puzzle. Brick paving, as in the other half, is always of a much later date. Where stone could not be conveniently procured, beaten earth was used, covered with rushes.

Of the illustrations given this week, the larger timber cottage and the house with recessed centre at Compton have been a good deal repaired and restored, but not in such a manner as to alter their character. The roofs to the top windows in the latter are modern, but otherwise the house is a good example of a not uncommon type of the farmhouse, a feature of which is the peculiar arrangement of hips. The recessed part was the hall, or common room, with the private rooms on one side and the kitchen and offices on the other.

The cottage at Compton is an example of a very good and straightforward form of cottage of the simplest form, being a parallelogram with roof hipped at each end.

A cottage of this form, with its roof bright with lichen and its front covered with creepers, is as beautiful as many tortured into fantastic shapes where all repose and simplicity is lost. Anxious, however, as the landowner generally is to secure economy of cost, it is not often that he or his architect can be persuaded to trust to simplicity of line and good proportion, and to the hand of time and the gardener, rather than to overdone gables and fantastic barge-boards.

This particular form of simple cottage is, however, very carefully designed as to proportions and the way the hips are worked out, and owes something to such little dodges as, for instance, the way the roof joins the chimney.

The cottage at Farncombe is of later date. The walls are of stone, with joints galletted, that is, studded with little pebbles of black ironstone. This was a favourite plan at later date in this country of rough stone.

The house at Unsted is an old Manor House, of which it is reported, perhaps correctly in this case, that one wing has been taken down. The chimneys are of very good workmanship, and I will hereafter give a measured drawing of them. The ornaments in head are mutilated, but were probably projecting "crow-rests," as to be seen at Guildford and elsewhere.

My sketch was taken many years ago, and when I last saw the house the ivy had so grown over this part as to hide all detail. R.N.

**The Association of Public Sanitary Inspectors of Great Britain.**—Under the auspices of this Association, a public conference on "Sanitation" is to be held this Saturday, the 25th, in the Royal Pavilion, Brighton. The chair will be taken by Mr. Edwin Chadwick, C.B., President of the Association, who will be supported by Dr. B. W. Richardson, F.R.S.; Sir Douglas Galton, F.R.S.; Mr. J. W. Howlett, Chairman of the Hove Commissioners; Dr. J. Ewart, Chairman of the Sanitary Committee, Brighton; Dr. Arthur Newsholme, Medical Officer of Health, Brighton; Mr. Hugh Alexander, Chief Sanitary Inspector, Shore-ditch, Chairman of the Association, and other gentlemen.

#### CAMBRIAN ARCHEOLOGICAL ASSOCIATION.

We now conclude our account of the annual congress of this Association.\*

On Wednesday, the 15th inst., the members left the Bear Inn, Cowbridge, for Ewenny, driving along the old Roman road, which could be traced topping bill after hill till lost on the horizon. The first halting-place was St. Bride's Church, in which are some good monuments; especially noteworthy is a sculptured slab to Johan de Botiler, which is a valuable specimen of the period of the transition from mail to plate armour. The knight wears mail, with a gorget of plate, and a head-piece of mail (circa 1270). Unfortunately a considerable portion of the slab is covered up by some ricketty boarding.

From St. Bride's the excursionists went to Ewenny Priory, according to Mr. Freeman "the best specimen of the fortified ecclesiastical building in Wales," a purely Norman structure; what remains has undergone very slight modification, and it is an admirable example of the kind of church in which the early invaders worshipped, while still surrounded by an unconquered race. Ewenny is a cruciform church, with a massive central tower. The nave is in use as the parish church; the choir and presbytery, which formed the Priory church, has been preserved by post-Dissolution owners as a burial-place. Colonel Picton Turbervill, the present owner of Maurice de Londre's Benedictine Priory, met the members of the Association and conducted them through the church and grounds, pointing out what discoveries had been made since Mr. Freeman wrote his description of Ewenny. Colonel Turbervill had kindly caused to be reprinted in pamphlet form, for the use of the visitors, papers on the Churches of Coity, Coy Church, and Ewenny, which had been contributed to Vol. iii. of the third series of the Association's *Journal* by Mr. E. A. Freeman; and that of Coity Castle by Mr. G. T. Clark, which appeared in No. 29 of the fourth series of the *Journal*. This pamphlet proved of great service to the members.

Taking leave of Col. Turbervill, the members made their way to the castle and church of Coity. The lordship of Coity was owned by a son of Jestyn, the last Welsh lord of Morgannwg, and was granted by Fitz-Hamon to Payne de Turbervill. Sir Payne or Pagan probably occupied the fortress (character unknown), which had been erected by his Welsh predecessors, and strengthened his position by a marriage with Sybil, the heiress to the last Welsh owner. Indeed, he seems to have been much under the influence of his wife; at all events, he favoured the Welsh in the frequent disputes which arose between conquerors and conquered, constantly using his influence in favour of the natives. Mr. Clark thinks Sir Gilbert, great-grandson of Sir Payne Turbervill, may probably have been the founder of Coity. Like his great-grandfather, he married a Welsh heiress, and maintained the traditional policy of his forefathers. He was in possession of the property in 1207. The reason for supposing this Sir Gilbert was the founder is that the earliest work in the castle seems to be of his date. Norman work is not to be discovered. The castle consists of an inner ward, to the north-west of which was attached a rectangular court forming the outer ward, the whole surrounded by a ditch. The inner court is enclosed with a certain wall 8 ft. thick; on it are two gate-houses and a tower, attached to which are the hall, domestic buildings, and chapel. The keep is nearly rectangular, projecting on its eastern side into the ditch. The basement of the projection is a plain vault, lighted by two loops, and was probably a prison. The basement of the keep itself consists of two vaulted chambers, with a stair leading to the first floor. The first floor also was divided into two vaulted rooms. Above were two more floors; these were of timber, and have disappeared. The round tower stands on the south-west front of the inner ward; it had a basement and three upper chambers.

In Coity Church is an unusual arrangement of piscina and sedilia. Of the three recesses, the westernmost one only forms a sedilia; the middle one appears to have contained a credence-table, and the easternmost one a piscina. In this church is a fine ark-shaped oaken chest, adorned with an elaborate carving representing the Passion.

At Coy church are two crosses with interlaced work and inscriptions, one at the east end of

\* See p. 123, ante.

the church, and the other on the south side; the latter was perfect a few years ago, when the stone was drawn by Professor Westwood, but when the central tower subsequently fell, this interesting monument was broken in several pieces, but it was suggested that these might be joined together. Both of these crosses bear the name Ebis-or, which is also found at Llantwit.

In Llangan churchyard is a wheel cross, which is represented the Crucifixion; on the left side is the Roman soldier with the spear; his legs (for want of room) are so curled up that he appears to kneel. On the right another figure is represented holding the sponge. This is a very interesting stone.

At the evening meeting, Mr. Stephen Williams, F.R.I.B.A., read an excellent paper on the excavations which have been carried on at Strata Florida Abbey under his direction; he was followed by Mr. J. Willis Bund, F.S.A., who propounded the question "Who was the founder of Strata Florida Abbey?" and, in reply, "ventured to think that he was to be looked for not amongst Welsh princes, not among English kings, but where the founders of so many religious houses might be discovered,—among the great Norman Conquerors,—and the great house of Clare." As may be supposed, this proposition led to a fierce onslaught from the monastic members, headed by Mr. David Lewis and Mr. Edward Owen, but to the impartial foreigner it appeared that Mr. Bund held his own.

The next day, Thursday, the 16th, commenced with a walk round Cowbridge, the most remarkable features of the town being its walls and south gate-house, which, however, when compared with those of Tenby and Pembroke, seemed better adapted to repel orchard-robbing urchins than armed men. The church-tower is, however, a most military description. From Cowbridge the party went on to Llanblethian of St. Quentin's Castle, about half a mile from Cowbridge. The remains of this castle, which must have been of great extent and strength, have suffered so greatly from the wear and tear of ages that they are not easily made out. A grand west gate tower, somewhat resembling that of Llawbadan, in Pembrokeshire, is the best preserved portion; it seems to have been the entrance to the inner ward. Within is the wreck of an enormous shell keep, which some members of the Association deemed to be a unfinished work of Edwardian date.

From Llanblethian the party proceeded to the charming old Manor house of Llanfihangel. The approach is through an avenue of ancient yew trees, which are crossed again by other lines in the most delightfully mysterious manner. It is said that these represent yew hedges, which, having been neglected by the occupants of the house, gradually grew up and became trees. This story is, however, very doubtful, for the trees themselves show no signs of the pollarding knife, and are too far apart ever to have bordered a walk. In the house the visitors were welcomed by Mr. Jenkins (tenant of Lord Dunraven), who has carefully cleared the magnificent oak panels from incrustations of paint with which they were covered. The heraldic carving in this house is valuable, and will be taken in hand by some competent members of the Association. A very excellent piece of tapestry, representing Queen Esther before the king, hangs in the dining room.

From Llanfihangel a move was made to Llantwit Major, where Mr. J. Romilly Allen, F.S.A. Scot., one of the first authorities on early inscribed stones, gave an address on the sculptured stones of Llantwit. He said that Glamorganshire was celebrated beyond all other counties in Wales for the great number of sculptured and inscribed crosses of the pre-Norman period to be found within its area. Most counties were considered fortunate in the possession of four or five such monuments. Pembrokeshire claimed as many as twelve, but in Glamorganshire there were about thirty early sculptured stones, of which sixteen were inscribed, being very nearly one-half the total number existing at present throughout the Principality. In a district so richly endowed with ancient remains of the class there was no group of relics of the British Church in Wales of such transcendent interest as those at Llantwit, whether from the point of view of the historian, the archaeologist, or the artist. Similar collections of crosses were to be seen at Margam, Merthyr Mawr, and Coychurch, but none of these places had the association which still clung to the lichen-stained memorials



the past at Llantwit. If modern research made them assigning these monuments to the back age of St. Illtyd, of Samson of Dol, of idoc of Llancarvan, or of Gildas, the father of 'dash history, their inscriptions bore witness to advance in learning, and their decorative atures to the art-culture, which in the fullness 'time were the fruit borne by the labours of the first teachers of Christianity in Glamorgan-ire. The crosses at Llantwit were five in umber, three being inscribed and sculptured, id the remaining two ornamented only. The positions they occupied were as follow:—No. 1, e cross of Samson, Illet, Samuel, and Ebisar, ect in the churchyard on the north side; o. 2, the cross of Houelt, son of Res, within e old western church; No. 3, the pillar of unson, King Juthael, and Arthmael, erect ainst the east wall of the south porch of e old western church, outside; No. 4, the ircular pillar erect against the north wall of e old western church, outside; No. 5, the oken cross shaft within the old western urch.

The visitors next went inside the church, hich, even if it were not at Llantwit, would e remarkable structure. The keel-shaped pillars, ow that some portion is late Norman. It sists of two churches, the disused western or urch, and the eastern or parish church, ill in use. Facing the church on the north-ide are some remains of the old monastery, sisting of mere earthen ridges; these would y likely well repay their excavator, for ere if anywhere we might expect to find sp-imens of pre-Norman Welsh architecture. Some e visitors examined a hoard of bronze mplements which was unearthed at Llantwit. The party next proceeded to Caer Urgan, hich place are evident remains of founda-ons, and which tradition asserts was the cient city of Caerguorcon. Mr. John orrie, of the Cardiff Museum, had been cavating for some days in the interest e Cardiff Naturalists' Society, and had ough to light fragments of Samian ware, man tiles, charcoal, British pottery, frag-ents of oxydised iron, a second brass of etorinus (A.D. 267), a small bronze boss, an of black, well-burned pottery, enclosing a aller vessel, both of Romano-British make. The only masonry discovered was a dry stone all near the cinerary urn, and probably con-ected with it. It is difficult to decide off-hand e character of data that are still under-ound, but it seems probable that these remains e what tradition declares them to be, the ics of a Romano-British town, and not the ics of a great man or a mere military camp; so, the Cardiff Naturalists' Society are to e ngulated on their find, which is likely to ove of very great archaeological interest.

Leaving Mr. Storrie, the members passed on St. Donat's Castle, the old home of the Strad-egs, where they were received by Dr. Carne, e present owner (who, by the way, is de-ended from the Stradlings). The building es from the eleventh century. In some of e rooms are good Jacobean panellings, and the icerable mansion excited the admiration of e party.

In the evening a meeting was held, at which r. David Jones read an interesting paper on "Old Glamorgan," and the hon. secretary, Mr. uws, one on "St. Fagan's Fight."

On Friday, the 17th inst. (the last day of e meeting), the party drove to Llandaff Cath-edral. On the road some interesting prehistoric mains were visited. Especially noteworthy is e great cromlech in Tinkin's Wood, near rffryn Brook. This stands still buried up to e chestons in a great "long barrow," and at e side of the cromlech it would seem that a iter chambered tomb has been formed, and in e barrow are indications of two other burial-aces of this nature. At St. Fagan's, the embers were met by the Rev. W. David, who nducted the party over his church, the castle St. Fagan, and the ground on which the battle is fought in 1648. From thence the visitors eceeded to Llandaff Cathedral, the beauties hich were explained by Mr. Seddon. After-wards, the party were entertained by the Dean d Mrs. Vaughan, and thus concluded one of e most enjoyable congresses ever held by the mbrian Archaeological Association.

**The Metropolitan Board of Works Inquiry Committee.**—Pressure on our space is week compels us to hold over a further statement of our special summary of the evi-ence. We hope to give it next week.

OBITUARY.

*Mr. William Eassie, C.E.*—We record with much regret the death of Mr. William Eassie, C.E., F.L.S., F.G.S., &c., which occurred at his residence in South Hampstead on the 16th inst. He was well-known in connexion with sanitary pursuits in general, and, in particular, was an ardent advocate of cremation. He was honorary secretary of the Cremation Society, of which, in conjunction with Sir Henry Thompson and a few others, he was one of the founders in 1874. Mr. Eassie had a varied and useful career. Born (according to the *Times*) at Loches, Forfar, in 1832, his early life was chiefly devoted to engineering pursuits, when he became a favourite assistant to the late Sir L. K. Brunel, and along with the late Dr. Parkes, of hygienic fame, he superintended the sanitary arrangements of Renkioi Hospital during the Crimean war. At the conclusion of hostilities, he took a band of navvies, and made the first excavations on the site of old Troy, a long time before Dr. Schliemann conducted similar operations. In 1873 he published "Healthy Houses," and subsequently "Sanitary Arrangements for Dwellings." In 1874 he published his work on "Cremation of the Dead," and since the foundation of the Cremation Society he has been the editor of its periodically published "Transactions" and one of the principal contributors to its pages. He was a prominent member of the Sanitary Institute of Great Britain.

*Mr. John M'Lean, architect.*—The *Sootsman* announces the death of Mr. John M'Lean, architect, Stirling, which occurred on the 13th inst. Originally a mason, Mr. M'Lean had the charge, under the late Mr. Rothead, architect, of the construction of the National Wallace Monument on the Abbey Craig, a work which he satisfactorily completed. He was afterwards appointed Master of Works for the burgh, and in this capacity he designed and partly carried out the feuing of the Hospital lands, the drainage and blocking of the streets, and other improvements. Latterly he devoted his whole attention to his work as an architect. Mr. M'Lean, who was about fifty years of age, leaves a widow and grown-up family.

THE ETRUSCAN LANGUAGE.

SIR,—As I have seen in a recent article in the *Builder* that the decipherment of Etruscan text is proceeding in Italy on the basis of a comparison with Basque, will you allow me in the interest of British scholarship to note that the discovery of the character of the Etruscan language is due to Dr. Isaac Taylor, and was published in 1874?

The Etruscan numeral for "five" is nearer to Basque than to any other Altaic language; but, although Basque has preserved a very archaic grammar, it cannot be much trusted for vocabulary, because there are several dialects, and the words undergo most remarkable alterations in these.

The general sense of many Etruscan texts has long been established by Dr. Taylor and by those who have followed in his footsteps; but the Akkadian and the Ugric languages form more reliable comparisons for vocabulary than the Basque, which belongs to the same general class.

C. R. CONDER, Major, R.E.

THE METROPOLITAN BOARD'S HOLIDAYS AND THE BUILDING TRADE.

SIR,—I made an effort the day the Metropolitan Board rose for its recess to cause a reform that I think of interest to the building trade. I failed, and unless the matter is taken up by the trade, our successors will, I fear, follow on the same lines in the future. The case is this:—1,100 original building applications are made to the Board in the year. Many of these are amended, and come before the Board more than once. I deal with the original applications only (1,100 average). The Board adjourns for seven weeks, and during that time no building application can be granted. The Board cannot delegate its powers to a committee. I found out the position of matters this time last year, and I immediately took steps to try to remedy the grievance. I got the matter referred to the Building Act Committee, but they could not see their way to remedy the defect. I therefore moved that the recess be for three weeks, the Board then to meet to deal with building

applications only, or matters of emergency, and then to adjourn for four weeks more. It was very little that I asked. It was only for once, and the men who sacrifice four days of their week during the year would not, I think, have been found wanting on this one day. I guaranteed a quorum, and promised that no doubtful application should be granted. Unless the matter is recorded and kept in mind, the new Board, when it adjourns next August, may commit the same wrong.

The number of applications received during the recess last year was 115. These could not be considered until the end of September, and then had to be brought before the Board, then to be referred to the Building Act Committee, then to be brought back to the Board,—a loss during the best part of the building year of, say, eight or nine weeks, or say one-sixth part of the year. Is this a grievance or not? For my part I feel, although the economists laugh at me, that this is one of the causes of pauperism in London. The rough labourer, if thrown out of employ now, has no money to meet the winter. A few weeks' work now may enable him to tide over the bad times. This is, however, a matter for wiser heads than mine. I see the wrong. I see the remedy. Some one who follows me on the new Board will, I hope, consider this worthy of attention, and coming from the people, with all their new zeal upon them, this little reform—this great wrong—ought to be made right. I may mention that no daily paper notices the subject.

CHARLES MOSSOP,

Member of the Metropolitan Board of Works.

46, Cannon-street, E.C., Aug. 18.

A CRY FROM ST. MARY-LE-STRAND.

SIR,—As you are both within sight and sound of me, may I make so bold as to call your attention to my piteous and forlorn condition? I am reckoned handsome, and really do feel superior in that way to my brother, St. Clement, further east; but, as he has such a noisy tongue in that head of his, called a steeple, people think more of him than they do of me. I hear whisperings and mutterings in the air about doing away with me, and my proper guardians have done all they can to make me look as ridiculous as possible, in the hope that people will weary of me, and vote me a nuisance; and they have done their best to make me so. They first put a public convenience close underneath my east window, and then proceeded to spoil my very beautiful semi-circular porch by patching my columns with new stone, and omitting the entasis, giving it a very crippled look. I had scarcely survived this indignity when they heaped fresh ones upon me; they knocked off my vases which made my tower so handsome, and they have been knocking holes into me in all directions, and breaking my cornices and entablatures with their scaffolding, and cutting pieces out of me for no reason whatever; they have surrounded me with a horrible hoarding, from which they derive quite a small revenue, and all to make me look ridiculous, which, on my honour, Mr. Editor, I am not; I am as sound as anybody, and much more so than the Board of Works. I have had many vicissitudes in my time; I used to stand over the way, but the Duke of Somerset pulled me down to make way for his house, but, poor man, he got pulled down too, and lost his head in the scuffle, and they are trying their best to make me do the same; but I will try, and be calm, although I may be a little "vane" at the top. When Mr. Gibbs put me here they pulled down the Maypole, but honoured its remains by re-erecting it at Wanstead Park as a stand for a telescope, at the request of Sir Isaac Newton; and in a subsequent communication I received from its honoured stump it mentioned:—

"There stood I only to receive abuse,  
But here converted to a nobler use;  
So that with me all passengers may say  
I'm better far when in the Pole of May."

Alas, the first line is prophetic of my sad state! I supplanted it, and now "stand I only to receive abuse." I used to collect the Saints of Drury-lane; but now not even the sinners, much less the saints, come near me, through no fault of mine. They don't want to make me attractive, and have made the services within my walls, formerly dignified and musical, cold and repelling to sinners and saints alike. I have heard of a society with a very long name which is supposed to look after poor churches like me, but I suppose its members are too busy writing impertinent letters and interfering with every one's business, and not minding their own, or shrieking wildly about St. Mark's, Venice, or other far-away structures, forgetting they ought to look at home first, and instead of picking holes in other people's coats, make them do their best to prevent people picking holes in mine. Just look, Mr. Editor, at my walls, and what they have done with that which Anne and piety ordained for other uses. I could blush for the age, only it is no use, for what with soot and hoarding it would never be seen, and I



should waste it on the desert air. I have only one clapper, and that I raise in indignant protest against the vile treatment to which I am subjected. If they want to widen the Strand "all along of them penny busses," let them pull down the south side of Holywell-street—it does not belong to me—and leave me alone to be of use to those for whom I was built, and a joy for ever to people of cultivated taste who can appreciate my beauties. Admit my protest, if you can do nothing else for me, Mr. Editor, and I shall ever be, yours, gratefully,

THE CHURCH OF ST. MARY-LE-STRAND.

#### THE QUEEN'S PARK ESTATE, BRIGHTON.

SIR,—I observe that in your "Notes" (p. 116, ante) reference is made to the sale of the "Queen's Park estate, Brighton." It is therein stated that Mr. Duddell's villa was built by King William IV. for Queen Adelaide. The same statement has also appeared in the auctioneer's advertisements, but is quite without foundation.

I should not think the matter of sufficient importance to trouble you about were it not that the house is really of some interest in connexion with the early life of Sir Charles Barry.

In 1829, Sir Charles, then Mr., Barry, gained in competition St. Peter's, the new parish church, at Brighton. In the following year he became acquainted with Mr. Thos. Attree, head of the well-known firm of Attree & Clarke, solicitors, in Brighton. Mr. Attree, much impressed by the talent of Mr. Barry, engaged him to build his villa.

"The work deserves notice as his earliest essay in the style in which he first gained his fame, and which to the last (in spite of the Gothicists) he maintained to be in some respects peculiarly fit for mansions of the present day. Small as it was, it was designed with as much care and finish as any of his larger works. In it, for the first time, he had an opportunity of carrying out his ideas of 'architectural gardening,' as the house was set in a terrace garden, with small fountains and pretty loggias, after the Italian manner. It led indirectly to a larger work, 'Trentham,' for the Duke of Sutherland."

The south front of the house is not unlike the south front of the Travellers' Club.

On Mr. Attree's death the property was sold, and an ignorant and unappreciative purchaser covered the terrace walls of the gardens with banks of earth, and spoilt their charm. Mr. Attree lived and died in the house. King William IV. and Queen Adelaide never had anything to do with it; and as Mr. Attree was my father's partner, and I recollect the house and gardens from my earliest childhood, I have good authority for my statement.

SOMERS CLARKE, Jun.

Westminster, Aug. 18, 1888.

#### ST. GEORGE'S, BLOOMSBURY.

SIR,—Before the restoration<sup>(1)</sup> of this church, the interesting gallery which Mr. Graham has drawn ran round the church, while the present pulpit was decapitated from the original.

Some years ago there were four lions and unicorns at the base of the tower, between the pediments; one coming to the ground, the remaining three were at once removed,—a parallel to the St. Mary-le-Strand vases case.

One looks in vain for illustrations of the delightful panelling in the baptistry, or of the ingenious lamp standards on the portico bases.

Bloomsbury-square.

Aug. 18, 1888.

WILLIAM A. PITTE.

#### CAST-IRON CAPS TO CHIMNEYS.

SIR,—With your permission I should like to ask the opinion of readers of the *Builder* whether a cast-iron or masonry cap is better to finish off the top of a factory chimney-shaft? In travelling lately through Birmingham and district, I noticed that most chimney caps are built either in stone or brick, and have also noted well the examples of iron caps illustrated in Bancroft's treatise on tall chimney construction, but cannot see any valid reason for finishing off a chimney stalk with a cap of metal.—C. J.

\* \* Nor can we.—Ed.

#### THE BASSET MOTTO.

SIR,—In your paper of August 18, page 124, you cite the two renderings of the Basset motto as inscribed over the entrance-gates of Old Beaupré, near to St. Hilary's; and add that this motto is now borne by the Welsh (41st) Regiment. The "Gwell angau neu chwylydd" of the Army List figures on the regimental caps and appointments as "Gwell angau neu chwylydd"—signifying "Better death or dishonour." The War Office has just undertaken to correct its silly blunder of using "neu" for "na." GRIFFITH.

August 21, 1888.

\* The Life and Works of Sir C. Barry, p. 75.

## The Student's Column.

### ARTIFICIAL STONES.—VIII.

Artificial Stones partly formed of Organic Matter.

ARTIFICIAL stones in which organic matter constitutes the binding or other prominent ingredient are of importance and interest in some instances. Sugar, for example, added to stone mixtures containing lime, seems to harden the product in a remarkable way. For years past, we are told, it has been the custom in India to add a certain amount of raw sugar to mortar, which, thus treated, becomes excessively hard. Some authorities consider it probable that the Chunnam polished walls of Madras were built with a cement to which a small proportion of sugar was added. Herzfeld has recently reported that he used a cement consisting of one part of lime to three of sand to which about 2 per cent. of sugar had been added to plaster a wall in the new buildings of the Berlin Natural History Museum. On the day following its application the plaster had hardened completely. He also found the same mixture useful for joining bricks, and, so far as can be judged from a few months' trial, it promises to be very durable. The mortar must be freshly made, and without too great a proportion of water, and good molasses will yield as satisfactory a result as solid sugar.

Bennett & Peet, in their improved composition for decorative mural and other work, patented in 1885, also utilise the hardening property of a small proportion of sugar. The composition is formed of common whitening forty parts, plaster of Paris six parts, glue three parts, and molasses three parts, worked together with sufficient water, and, if necessary, suitable colouring matters.

The action of the sugar is based upon its property of dissolving lime, the saccharine compound forming a kind of cement and binding together the particles of the stone composition. Several patent stones contain glue, gelatine, and similar materials as the cementing ingredient, but for the most part they are only suitable for certain classes of indoor work.

Marshall's patent "Intonaco," brought out in 1843, was, however, recommended as an ornamental stone that was both fire and water resisting; it was formed of a mixture of plaster of Paris and water, incorporated thoroughly with a compound called by the patentee "the bind," which consisted of gluten, gelatine, oil, and indiarubber melted together; for a rougher stone, sand and white or red lead were added to the plaster, before mixing with the "bind."

In 1859 provisional protection was granted for a mixture of starch or talc with gelatine, glue, &c., intended as an imitation marble. The same year, ornamental stone mouldings were introduced by a German patentee, who formed them by melting together gutta-percha with such metallic oxides as those of zinc, calcium, &c., and, if necessary, suitable colours.

W. Kirrage in 1860 patented plastic compositions to be used in the fabrication of artificial stone, which were made up of gluten, gelatine, albumen, fat, &c., with caoutchouc, plaster of Paris, or other cement, fine sand, pounded glass or marble, metal filings, red or white lead, and any colours desired. The following are the directions given:—Four parts of gluten and two parts of gelatine or albumen are boiled to the thickness of ordinary glue; then one-sixteenth part of fat and one-fortieth part of caoutchouc are added. These materials, having been intimately mixed, are added, while boiling hot, to plaster of Paris or other cement, sand, pounded marble, &c., &c., together with desired colours. After rolling and moulding the substance will set very hard, and in twenty-four hours be capable of taking a good polish.

Blood, such as that of bullocks and other animals, has for many years been known to be a useful hardening addition to cements, and its use in the fabrication of facitious stone was patented in 1854. The composition was formed of sand, lime, oil, and litharge, well mixed and then added to a sufficient quantity of blood; the substance sets hard, and forms a durable stone.

Resins, gums, and allied substances have also been largely used, and the following are the most noteworthy of the compositions in which they are employed:—

Barlow's patent, obtained in 1807, for the

preparation of compositions which he termed "Ebenosamic" and "Ebengavinbosamic" intended for use as decorative moulding imitative variegated marbles, &c., is a vague one, the compounds being merely described as mixtures of aromatic herbs, gums, resins, and spirits of wine.

C. Westendorp, jun., patented in 1857 compositions for ivory-like decorative stones, which were combinations of powdered ivory, glass, cotton, wool, and similar small particles with gum dammar, gum copal, resin, shell wax, &c.; the substances might be united by pressure and heat or by the addition of solvent of the gums.

Frost's artificial stone was at one time largely used in Chicago and other cities in the United States (English pat. 2,759, 1869). An aqueous solution of shellac is used for binding together the particles of the stone, which is generally formed of a mixture of Portland cement and sand.

Orsi's "ornamental or metallic lava" was a compound of ground flint, two parts; man broken in small pieces, three parts; resin, 4 parts; wax, one-tenth part; and suitable mineral colouring matters. This composition can be used for the formation of tessellated pavements if the slabs are laid on a foundation of concrete. "Artificial lava" and "Basilic lava" were mixtures of broken stone or gravel with powdered chalk, wax, and tar in various proportions, introduced by the same patentee in 1848.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

11,287, Ventilating, &c. De Fonblanque Pennefather.

According to the inventor, simplicity is aimed at by this invention. The air is drawn and removed from the room through apertures in a tube system of tubes, disposed around the walls at upper part of the room. These tubes, if desired, may serve for ordinary "picture-rod" apertures in the tubes are provided with diffusing nozzles. The pressure for moving the air is obtained by placing the exit end of the tube in the chimney of the fire-grate, the exit end of the tube in the room and then leading it upward outside the house. For ventilating railway-carriages, funnels may be placed outside to obtain the required passage of air through the tubes.

12,279, Fire Grates. E. B. Williams and Clifford-Morgan.

The objects of this invention are (1) the assumption of smoke, (2) ventilation in summer without soot or dirt, (3) preventing the usual effects of draught, (4) intense heat by the peculiar structure of the back, and other consequent results. The back of the grate is made of fire-brick in form of a chair, the face of which is concave in lower portion and convex in the upper portion; upper projecting over the lower portion. A number of holes are made through the back so as to form communication with the flue, which is arranged to pass at the back of the fire-brick as well as back of the usual opening above the fire. A radiator is fixed at a suitable slope. The bottom of the grate is made of solid fire-brick, that is, without aperture for the admission of air to the underside of the grate and air is admitted by a "hit-and-miss" slide. When the top door is closed and the smoke or other gas are passing through the holes in the fire-brick, the current of air passing from the room (or source) up the back flue meets the gases or carbon and promotes complete combustion.

12,603, Fastenings for Doors of Theatres. W. Baird.

The doors which are the subject of this patent are hinged to open outwards, and are secured means of bolts opening sockets in the door-frame at the top and in the floor at the bottom, the door being being coupled by a link or lever, that they are shot out and in simultaneously, and either bolt is attached a helical or other spring arranged to withdraw the bolts on their being released from a locking catch by which, when out, the bolts are held. A bell crank is actuated by a board hinged to the inside of the door, adapted when pushed towards the door by pressure of the crowd to effect the disengagement of the catch, and the consequent withdrawal of the bolts, so that the door may swing open.

12,618, Combined Door Spring and Check. P. A. Aytton.

According to this invention, one end of the bar in a pneumatic door check is made to revolve turn on a hinged joint, the outer end of the bar being connected with a joint transversely to the spindle or axis of the closer. A pneumatic cylinder adapted to control the slamming of the door.

12,729, Forming Threads upon Wood Screws. C. D. Rogers.

The thread of the screw is, according to



vention, raised from the body of the blank by impression and by rolling between dies provided in V-shaped grooves presenting between them a series of bars or projections, narrow at the ends and as they commence to form the thread, and gradually increasing in width to act laterally upon the metal between them and force it into the grooves.

7,957, Preventing Down-draughts in Flues. B. Tonge.

By this invention a frame or drawer of fireproof material is inserted from the outside of the flue at any point above the roof line or otherwise accessible on the outside. The lower edge of the back of the frame or drawer carries chisel-pointed lugs or pins inserted in the brickwork joints at the back of the flue. The face of the frame stands flush with the outside of the flue, thus affording complete support to the frame, its back resting on the lugs, and its front resting in the hole made for insertion of the drawer or frame. The face of the frame is filled in by an air-brick to allow for the escape of any down-draught. The inventor claims the advantage of a sliding frame filling the whole of the flue with dual system of flaps, rendering vapour of smoke beyond the frame virtually insalable.

NEW APPLICATIONS FOR PATENTS.

Aug. 10.—11,519, J. Taylor, Stench Trap for sewers.—11,532, P. Mooney, Syphon Apparatus for outside of the flue, thus affording complete window-sashes.—11,538, T. Lane, Wooden Roof.  
Aug. 11.—11,587, A. Hardy, Alarm Bells for doors.—11,589, R. Hall, Attaching Cords to Sash Window-Frames.—11,603, C. Darrah, Ventilators.  
11,610, H. Johnson, Bricks for Pavements and Coors.  
Aug. 13.—11,671, A. Kapteyn, Ventilation of Aminals and Sheds.  
Aug. 14.—11,711, T. and M. Howe, Tubular Wires.—11,715, F. Wheeler and W. Johnson, Removing and Replacing Window Frames, &c.—11,737, G. Binswanger, Electric Bell Pushes.  
Aug. 15.—11,759, T. Bates, Flap Ventilators.—11,762, E. Emanuel, Manhole Cover.—11,785, T. J. J. Door Checks.  
Aug. 16.—11,793, J. Adams, Check Action Swing for Hinges and Fittings.—11,796, D. O'Halloran, All Pulls.—11,798, W. Woodall, Fittings for electric Bells.—11,805, G. Salter and F. Baker, Fasteners.—11,811, F. and M. Baker, Door Hooks.—11,814, B. Snell, Spring Catch for Sash and Door Fasteners.—11,828, F. MacGauran, Gate Fittings.

PROVISIONAL SPECIFICATIONS ACCEPTED.

7,915, A. Hausenchild and A. Baumeister, Portland Cement.—9,360, J. and W. Cormack, Ventilators.—9,460, C. Kinslow, Adjustable Mulet Gauge for Carpenters and Joiners.—9,905, T. Barter and A. W. C. Opening and Closing Fan and Skylights, Windows, Sashes, &c.—9,968, W. Lindsay, Bridge and other Structures.—9,986, F. Stokes, Manufacture of Cement.—10,149, S. Tuddenham, Metal Grips for Sash Bars, &c.—10,174, G. and C. R. Mason, Bath and Lavatory Basin Fittings.—10,288, Z. and J. Pack, Brick-Moulding Machines.—10,456, J. Stevenson and S. Eddington, Mould for Making Pressing Bricks.—10,477, W. Brothers, Hind-Mix Ventilators.—10,756, P. Normanston, Jet and Outlet Ventilators.—10,770, H. Hindoor-Fastener.—10,913, G. Davis, Drain-Traps.—11,200, W. Yearley and G. Dean, Paint and Varnish rushes.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.  
12,341, E. Kirby, Window-Fasteners.—13,161, Huntley, Devices for Cleansing Drains.—13,902, Punshon, Paving, Flooring, and Roofing Materials.—14,056, J. Bealand, Hinge for Doors, Gates, &c.—14,287, P. Keogan, Fastening Window Casements.—15,596, J. MacKintosh, Artificial Pavement.—16,234, J. Sheldon, Wall Tiles or Bond Iron.—785, R. Melbush, Combination Tool, Cabinet and enob.—5,969, H. Barfoot, Chimney-Pots.—8,092, T. Tunks, Bakers' Ovens.—9,634, W. Gregg, Brick-making Machinery.—10,258, H. Maul, Safety Door-bain.—10,312, G. Snelus and others, Manufacture of Cements.

**Lifts and Cranes.**—Mr. J. Stannah, of outwork-bridge-road, has recently introduced a new form of differential hydraulic crane or warehouses. From the description of it published in last week's *Engineering*, it appears to be able to effect a considerable economy in the consumption of water. The use of hydraulic lifts and cranes in connexion with the mains of the Hydraulic Power Company is rapidly extending in London, and we understand that Mr. Stannah has now in hand, among other work, a lift and crane for Messrs. Charles & Reynolds's new building in Fore-street-avenue; several cranes for Messrs. Gilson & Son's ice stores at Millbank, and several for the Phoenix Wharf, Southwark; also a low-pressure lift for the Southwark and Vauxhall Water Company, at their new offices in the Southwark-bridge-pad.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

AUGUST 10.  
By WELLS & READ.  
Hyde Park—19 and 23, Cambridge-terrace, 42 years, ground-rent £28 ..... 42,800  
26 and 37, Cambridge-terrace, 42 years, ground-rent £24 ..... 2,765  
Easton-square—71, Elizabeth-street, 38 years, ground-rent £7 ..... 1,200  
Kingsland—11, Mortimer-road, 48 years, ground-rent £8 ..... 270

AUGUST 14.  
By A. RICHARDS.  
Ponder's End, Garfield-road—Two plots of freehold land ..... 50  
By DEBENHAM, TEWSON, & CO.  
Fitzroy-square—23, Southampton-street, 36 years, ground-rent £6 16s. 3d. .... 790  
Easton-road, George-street—Improved ground-rents of £88, 18s., term 31 years ..... 1,400  
Britton—35 to 41 odd, Vassall-road, 13 years, ground-rent £32 ..... 220  
61 to 73 odd, Vassall-road, 1 and 3, Farrar-street; and 46 to 54, Baker-street, 13 years, ground-rent £56 ..... 240

AUGUST 15.  
By WHITE, BERRY, & TAYLOR.  
Chester-square—No. 24, term 34 years, ground-rent £29 ..... 2,570  
By INMAN, SHARP, HARRINGTON, & ROBERTS.  
Battersea—Ground-rents of £5, reversion in 75 years ..... 120  
By COLE, BLACKWELL, & COLE.  
Hoxton—62, Britannia-street, freehold ..... 320  
By F. JOLLY & CO.  
Wanstead, Hermon Hill—Douglas House, freehold, Mile-end—234, Burdett-road, 60 years, ground-rent £6 ..... 1,500  
Bow—83, Malmesbury-road, 30 years, ground-rent £4 ..... 400  
70, Malmesbury-road, 83 years, ground-rent £4 4s. .... 295  
Deptford—46, Wellington-street, freehold ..... 475  
5, Deptford-green, freehold ..... 95

AUGUST 16.  
By D. J. CHATTELL.  
Edgware-road—70 and 72, Carlisle-street, 33 years, ground-rent £10 ..... 470

By FLEURY & SONS.  
Wood-green—1, St. George's Villas, freehold ..... 470  
Broadstairs—Brewery Cottage, freehold ..... 340

By F. J. BISKY.  
Rotherhithe—2, 4, and 6, Silwood-street, 65 years, ground-rent £3 12s. .... 600  
65 and 67, Abbeyfield-road, 66 years, ground-rent £18 ..... 640  
Bernodsey—16 and 18, Anchor-street, 42 years, ground-rent £5 ..... 615  
Barking, King's-road—Nos. 32, 34, and 36, freehold A plot of freehold land ..... 345  
By NEWBORN & HARDING.  
Poplar—10, Woolmer-street, freehold ..... 260  
Britton—238, Milkwood-road, 78 years, ground-rent £5 ..... 290  
35, Loro-road, 38 years, ground-rent £12 ..... 250  
Finsbury Park—87, Digby-road, 87 years, ground-rent £7 7s. .... 515  
Whitechapel—4, Osborn-street, freehold ..... 585  
Peckham—197 and 201, Asylum-road, freehold ..... 760  
City-road—4, Remington-street, 36 years, ground-rent £4 ..... 315  
Holloway—15 and 17, Mount Pleasant-road, 79 years, ground-rent £9 10s. .... 395

AUGUST 17.  
By HORNBY, SON, & EVERSHIELD.  
Westminster—16 and 18, Bonney-street, freehold ..... 560

By WALKER & RUNZ.  
Old Ford—Nos. 33 and 52, Armagh-road, freehold ..... 615  
Nos. 54 and 56, Armagh-road, freehold ..... 575

MEETINGS.

SATURDAY, AUGUST 25.  
Architectural Association.—Visit to St. Dunstan's College, Catford Bridge. Members to meet under the clock at Cannon-street Station at 2 p.m.  
Association of Public Sanitary Inspectors of Great Britain.—Public Conference on "Sanitation" at Brighton, under the presidency of Mr. Edwin Chadwick, C.B. Royal Pavilion, 11 a.m.  
MONDAY, AUGUST 27.  
British Archaeological Association.—Opening meeting of Forty-fifth Annual Congress, to be held in Glasgow.\* Visit to Langside, and subsequent inspection of Glasgow Cathedral, under the guidance of Mr. John Honeyman.

TUESDAY, AUGUST 28.  
British Archaeological Association (Glasgow Congress continued).—Visit to Bothwell Castle and Church, Craigneath Castle, and Lanark. Inaugural Address in the evening at Glasgow by the President, the Marquis of Bute.

WEDNESDAY, AUGUST 29.  
British Archaeological Association (Glasgow Congress continued).—Visit to Torwood Castle, Tapoch Broch, Bannockburn, Stirling Castle, and (time permitting) Cambuskenneth Abbey. Meeting at Glasgow in the evening for the reading of papers.

THURSDAY, AUGUST 30.  
British Archaeological Association (Glasgow Congress continued).—Steamboat trip down the Clyde to Rothesay, where the ruins of the Castle will be described by the Rev. J. K. Hewison, F.S.A. Scot., Mr. E. P. Loftus Brock, F.S.A., and others. Subsequently, the St. Andrew's House of Lubus, the Vitrified Fort of Dunagail, the Chapel of St. Blaine, and Mount Stuart House, will be visited. (No evening meeting.)

FRIDAY, AUGUST 31.  
British Archaeological Association (Glasgow Congress continued).—Visit to Paisley Abbey; and, subsequently

\* The detailed programme of the Congress was printed in last week's *Builder*, pp. 125-26.

returning to Glasgow, inspection of the Scottish antiquities in the model of the Bishop's Castle, Glasgow Exhibition grounds, and visit to the Hunterian Museum in the University. Evening meeting for the reading of papers.

SATURDAY, SEPTEMBER 1.  
British Archaeological Association (Glasgow Congress continued).—Visit to Dunrobin Castle, the Roman Camp at Ardoch, and Dunblane Cathedral. (No evening meeting.)

Miscellaneous.

**Co-operative Exhibition at the Crystal Palace.**—The so-called "National Festival of Labour" that has been held in the Crystal Palace during the past week has been interesting enough in its way as an incident in the attempted solution of the vitally important national and social problem, "the reconciliation of labour and capital," and it has served to disabuse some people of the idea that "Army and Navy," "Civil Service," or other "stores" for the mere distribution of commodities are representative of the main design of co-operation. But groceries, hosiery, leather goods, woollen and cotton fabrics, garden-seeds, patchwork-quilts, and Berlin wool-work do not constitute in themselves the materials of a very imposing display. The Exhibition afforded indications of a few attempts to adopt the co-operative system in the building trade, particularly in Paris, but how far these have been successful the exhibits in this line were too meagre to enable one to judge. The School and Guild of Handicraft from Toybee Hall had a stand, and exhibited some *reparous* work. The Home Industries section, as an industrial exhibition, constituted a very miscellaneous display.

**Canals and Waterways in Germany.**—We learn from recently-published reports of the United States consuls in Germany that the attention of the people is being strongly directed to the subject of improving the communications by water. "Nothing but canals is the order of the day in the German commercial world, the great cheapness of water transportation inducing people to consider projects for canals even in cases and places where such schemes seem hardly feasible. A canal between Leipzig and Wallwitzhafer is regarded as a thing of the near future. There is the scheme for the Baltic and North Sea canals. The Elbe and Trave are also to be united by means of this popular method of utilising deep streams. There has been much talk for a long time about uniting Strasburg and the provinces of Alsace and Lorraine with the Rhine at Ludwigshafen, opposite Mannheim, where that river first becomes navigable to vessels of deep draught. Another project is the construction of a canal to connect the river Main with the Danube, and thus afford a waterway from the North to the Black Sea. Frankfurt being in communication with the Rhine by means of a canal, which enables large vessels to ascend the Main as far as that city, it is intended to continue the canalisation and improve the waterways from the Main to the Danube, by which means an uninterrupted waterway would be obtained between the North and Black Seas. This would be a great advantage both to German commerce with Austria and to the domestic trade of the empire; but no careful estimate of the cost of the scheme has yet been made, and the expense of the enterprise may forbid its execution."

**A Dastardly Outrage** has just been committed in the churchyard of Ingoldmells, Lincolnshire. Some miscreants have disfigured it, it is feared permanently, a new marble monument, erected over the grave of a lady, by completely coating it with tar or gas-tar. The Rector, the Rev. J. C. Edwards, writes to ask whether any of our readers can suggest anything that will remove the tar from the marble without injuring the latter.

**Fixing Wood Flooring to Concrete.**—Herr Ludloff has patented a method for securing wood flooring to concrete, particulars of which he gave in a communication read before a recent meeting of the Society of Architects and Engineers of Hanover. Herr Ludloff proceeds in the following manner. Two or three days after the concrete floor has been laid down, consequently while it is still damp, thick sheets of jute (which may also be replaced by any other textile material, such as felt) are nailed to the floor with wrought iron nails 2 in. long, the nails being driven in at a distance, each way, of 4 in. After the floor has completely dried, the parqueting or herring-bone parquetry, is fastened down by means of the well-known paste of cheese and lime.



**Sale and Rebuilding of an Old City Tavern.**—The site of the "Daniel Lambert Tavern" on Ludgate-hill is about to be sold, together with some adjoining buildings, preliminary to their being taken down and rebuilt. Messrs. Farebrother, Ellis, & Co. announce the sale for the first week in next month. The "Daniel Lambert" is associated with many interesting reminiscences. The entire area to be cleared is 2,556 ft., and includes, in addition to the tavern, Nos. 10 and 12, Ludgate-hill, and 3, Ave. Maria-lane. On a portion of the site to be cleared it is proposed to erect a new modern tavern, with restaurant, the upper part to be let as offices and chambers. On the other portion of the site the erection of a building suitable for a bank or insurance office is contemplated. The Ecclesiastical Commissioners are the ground-landlords of the property, and they have entered into an agreement for a lease for a term of eighty years, at a ground-rent of 650*l.* per annum, the lease to be granted by the Commissioners on the property being rebuilt and ready for occupation by June of next year.

**Construction of a new Railway Station at Baker-street.**—The Metropolitan Railway Company have decided upon the re-building of what is now known as the "St. John's Wood Baker-street Station," and also to further improve and widen the old station at Baker-street, making it one of the most commodious stations on the Metropolitan line. The Vestry have consented to the road being stopped for a month in order that the contractor may be enabled to place the iron girders carrying the roof in position. The space of ground on which the new station is to be erected embraces a large area, commencing near Madame Tussaud's Exhibition, and extending a few yards past the present station. The old station is to be widened on both platforms, and the passengers from the Rickmansworth branch, instead of having, as they now do, to traverse the whole of the building, will walk through a short passage into their train. An additional bridge will also be thrown over the station to connect the St. John's Wood line with the West-end side of the station, and passengers to the City trains will be given greater facilities for reaching their destination by the widening of the up-platform. These extensions have become necessary since the completion and opening of the Finner and Rickmansworth line, it having been found that the accommodation at the existing station is totally inadequate to the requirements of the increased number of passengers.

**Value of Building Land at Herne Bay.** On Monday last, Messrs. Fox & Bousfield offered for sale, at the Dolphin Hotel, Herne Bay, twenty-one plots of freehold building land, having frontages to the Marine-parade, facing the sea and opposite to the pier, and also facing High-street, the principal thoroughfare in this rising watering-place. The sale also included nine freehold villa residences facing High-street, known as the Marina. There was a numerous attendance, Mr. Bousfield conducted the sale, and, before inviting offers, pointed out the rapidly-increasing value of building-land in Herne Bay. The plots submitted possessed frontages of 20 ft. each, and depths of 132 ft. There was a very active demand for the sites on the Marine-parade, the whole of which were sold at prices averaging 180*l.* each, being at the rate of about 9*l.* per foot frontage. Several of the freehold residences facing High-street were also disposed of for 540*l.* each, being let at rentals of 35*l.* per annum each. The total proceeds of the sale amounted to about 3,000*l.*

**American Mineral Production, 1887.**—We learn from the Mineral Statistics of the United States for 1887, just published, that the value of building stone quarried last year was 25,000,000 *dols.*, which shows a marked increase over 1886, when it was only 19,000,000 *dols.* The value of bricks and tiles made was 40,000,000 *dols.* This represents an increase of about 13 per cent. in the production of bricks, and a decrease in the output of tiles, due to the drought in 1887 in Indiana and Ohio. Prices were slightly lower. The production of lime is estimated at 46,750,000 barrels, with an average value of 50 cents a barrel. In 1886, it was 42,500,000 barrels. The production of cement from natural rock was 6,692,744 barrels, which, valued at 77½ cents a barrel, makes 5,188,877 *dols.* as the value of the year's product. The production of cement in 1886 was 4,500,000 barrels, of a total value of 3,990,000 *dols.*

**Seville Cathedral.**—In connexion with the catastrophe to which reference was recently made in the *Builder* [p. 107], a Madrid correspondent writes that the damage done by the collapse of the pier is very great, and irreparable. A portion of the second aisle was precipitated by the fall of the buttress, the falling débris causing utter destruction. The wrought-iron screen of Sancho Nuñez, erected in 1519, and parting-off the beautiful choir, with its richly-carved Gothic stalls, is completely demolished, as well as the stalls, and the organ, built in 1766. The same correspondent states that the catastrophe is due, partly to the neglect and dilatoriness of those charged with the restoration, and partly also to the tardiness with which the necessary funds for the work have been supplied. It is further stated that a strict investigation is to be instituted, and those responsible brought to account. Señor Canalejas, the Minister of Education, on receiving the news, at once hastened to Seville, where he is at present superintending the work of restoration. The Minister, a young man, is a native of the city, and is receiving the cordial support of the municipality and the inhabitants.

**The English Iron Trade.**—The English iron market is strong, exports being well maintained, and the home demand being now better than it has been for a long time past. The values of almost all products, whether crude or manufactured, are going up. The outlook for the remainder of the year is very satisfactory indeed. The business in pig-iron has not been so well sustained this year as it is now, and the tone of the market is very firm. Full rates are being obtained for all classes of pig. In the Scotch pig-iron market, with a growing demand, prices are much firmer, and, for some brands, still advancing. Bessemer iron has a rising tendency, and is quoted 6*d.* a ton higher, or at 4*s.* to 4*s.* 6*d.* in the north-west of England. Finished iron is strong in tone, the demand being very good, more particularly for ship-plates, which have advanced 2*s.* 6*d.* a ton, but notably for hoops and sheets, which cannot be had for immediate delivery, except at an advance upon present rates. The inquiry for tin-plates is brisk, prices having a rising tendency. Steel-plates, owing to the needs of shipbuilders, have risen 7*s.* 6*d.* a ton within a comparatively short time. Rails are stiffening in price, and are quoted up to 2*s.* 4*d.* for heavy sections, f.o.b. The shipbuilding trade is in a really healthy condition. Engineers are fairly active, and the long-delayed improvement in prices is coming steadily, if slowly.—*Iron.*

**An Immense Suspension Bridge.**—Mr. Gustav Lindenthal, of Pittsburgh, Pennsylvania, has prepared plans for an enormous suspension bridge, which is to span the Hudson between New York and the North New Jersey shore. The bridge is to cross the river in a single span, 2,800 ft. in length, which exceeds that of the two great spans of the Forth Bridge, each of which is 1,710 ft. wide, by 1,150 ft., and that of the Brooklyn bridge by 1,310 ft. In its principal features the proposed bridge is similar to the East River Bridge, but it will have double cables, one set above the other. The length of the end spans will be 1,500 ft. each, which will make the total length of the bridge, with the anchorages for the cables, nearly 6,500 ft. There will be double towers on either side of the Hudson, each 500 ft. high, and standing on masonry piers 340 ft. by 180 ft., rising 25 ft. above high water, with foundations on solid rock. The towers will be of wrought iron and steel, and will consist, each, of sixteen columns, octagonal in shape, and tapering from 7 ft. in diameter at the base to 5 ft. at the top. The cables are to be 50 ft. apart, and strongly braced together, to resist the depressing effects of heavy loads. Each cable will have a diameter of 4 ft. The elevation of the span above high water will be 140 ft. The cost of the bridge is estimated by the designer at 16,000,000 *dols.*, but other engineers give it at 40,000,000. The bill for the construction of the bridge is before Congress, and it is stated that there is no doubt that it will pass.

**Morewood & Co.'s Successors (Limited).**—The prospectus of this company has been issued. The capital is 40,000*l.*, divided into 8,000 shares of 5*l.* each. The company has been formed for the purpose of carrying on the old-established business of galvanizing as heretofore carried on at Birmingham Heath by Messrs. Morewood & Co., and subsequently by Morewood & Company (Limited,) for nearly thirty years.

**New Tower and Spire, Trinity Church, Wandsworth.**—The "capstone" of the spire of the Church of the Holy Trinity, West Hill, Wandsworth, was laid a few weeks ago by Mr. Few, churchwarden. The work of building the tower and spire had been in progress for a period of about ten months. Tenders, based upon quantities prepared by Mr. Clement Dowling, of Craven-street Strand, having been invited, that of Mr. Geo. Dobson, of Colchester, being the lowest, was upon the advice of the architect, accepted by the committee at the sum of 3,680*l.* The total height of the tower and spire together is 150 ft., the tower being 78 ft. and the spire 72 ft., with a finial, cross, and vane rising another 10 ft. The lower story of the tower forms a lofty porch, groined and vaulted in Bath stone, and enclosed by rich wrought-iron gates. Upon careful examination of the site and the existing building, which had been erected about twenty-five years, the architect considered it advisable to build the tower entirely independent of the church. It therefore rests upon a platform of cement concrete about 30 ft. square and 6 ft. in thickness; and as the south and east walls forming the walls of the church, appeared unequal to the great weight to be placed upon them, they were taken down and rebuilt on the foundations, so that the tower is constructively, unconnected with the church. The walls at the ground-level and for 25 ft. up are 3 ft. 6 in. thick, and built in cement; and are 3 ft. thick above that height to the top. They are built of brick internally, faced with Kentish rag-stone and Corsham Down Bath stone dressings. The spire is altogether of Bath stone, 18 in. thick at the springing and 9 in. above, while the uppermost 10 ft. is solid. Upon the top of the tower walls is laid a course of York stone as a "bed course" for the spire, and two wrought-iron chains run all round the walls at the springing of the spire, which is additionally secured by two iron rods, crossing each other diagonally. The work has been executed by the contractor, under the supervision of the architect, Mr. George Patrick A.R.I.B.A., the clerk of works being Mr. T. Sheldermine. The wrought-iron gates were made from the architect's design by Messrs. Cottam & Willmore, of Oxford-street. The finial, &c., is by Messrs. Hart, Son, & Peard, and Messrs. Newall & Co. supplied the lightning conductor.

**"Duresco."**—We are informed that "Duresco" has been used throughout the new Law Courts at Nottingham, some four or five tons of the material being employed. "Duresco," it may be said, is a water-paint, described as washable when thoroughly dry; and, as a distemper colour its makers, Messrs. J. B. Orr & Co., of Charlton, claim that it is surpassed by no other preparation, whether oil or water paint. The base of the material is the "Charlton zinc-white pigment," which is stated to impart to the "Duresco" a great body or covering power, which renders it (the starting price being low) an inexpensive material in use.

**East Acton Church.** The window at the east end of the south aisle has been filled with stained glass, representing the Crucifixion, to commemorate the Jubilee of the Queen. It is a gift from the ladies of the district, and is from the studio of Messrs. Powell Bros., of Leeds.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                     |                 | £. | s. | d. | £. | s. | d. |
|---------------------------------------------|-----------------|----|----|----|----|----|----|
| Teak, E.I.,                                 | ..... load      | 8  | 0  | 0  | 12 | 10 | 0  |
| Sequoia, U.S.                               | ..... foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Birch, Canada                               | ..... load      | 2  | 15 | 0  | 4  | 15 | 0  |
| White Pine, &c.                             | ..... do        | 2  | 10 | 0  | 4  | 10 | 0  |
| Oak                                         | ..... do        | 2  | 0  | 0  | 4  | 0  | 0  |
| Canada                                      | ..... do        | 4  | 0  | 0  | 6  | 10 | 0  |
| Pine, Canada red                            | ..... do        | 2  | 10 | 0  | 3  | 10 | 0  |
| " "                                         | ..... yellow    | 2  | 10 | 0  | 4  | 0  | 0  |
| Lath, Danish                                | ..... fathom    | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                              | ..... do        | 5  | 0  | 0  | 6  | 0  | 0  |
| Waincoat, Odessa, crown                     | ..... do        | 2  | 10 | 0  | 3  | 0  | 0  |
| Danish, Finland, 2nd and 1st, std. 100      | ..... do        | 8  | 0  | 0  | 9  | 10 | 0  |
| " "                                         | 4th and 3rd     | 6  | 10 | 0  | 7  | 10 | 0  |
| Riga                                        | ..... do        | 6  | 0  | 0  | 7  | 10 | 0  |
| St. Petersburg, 1st yellow                  | ..... do        | 9  | 10 | 0  | 15 | 0  | 0  |
| " "                                         | 2nd             | 8  | 0  | 0  | 9  | 0  | 0  |
| " "                                         | white           | 7  | 10 | 0  | 10 | 0  | 0  |
| Swedish                                     | ..... do        | 7  | 10 | 0  | 16 | 10 | 0  |
| White Sea                                   | ..... do        | 8  | 10 | 0  | 17 | 10 | 0  |
| Canada, Pine, 1st                           | ..... do        | 15 | 0  | 0  | 24 | 0  | 0  |
| " "                                         | 2nd             | 9  | 10 | 0  | 15 | 10 | 0  |
| " "                                         | 3rd, &c.        | 7  | 10 | 0  | 9  | 10 | 0  |
| " "                                         | Spruce          | 8  | 10 | 0  | 9  | 10 | 0  |
| " "                                         | 3rd and 2nd     | 6  | 0  | 0  | 7  | 10 | 0  |
| New Brunswick, &c.                          | ..... do        | 8  | 10 | 0  | 7  | 5  | 0  |
| Battens, all kinds                          | ..... do        | 4  | 10 | 0  | 11 | 0  | 0  |
| Flooring Boards, 4½, 1 in., prepared, First | ..... do        | 0  | 10 | 6  | 0  | 13 | 6  |
| Second                                      | ..... do        | 0  | 7  | 0  | 0  | 10 | 3  |
| Other qualities                             | ..... do        | 0  | 4  | 0  | 0  | 6  | 9  |



| TIMBER (continued).             |      |        |        |
|---------------------------------|------|--------|--------|
| Star, Cuba.....                 | foot | 0 0 34 | 0 0 34 |
| Honduras, do.....               | foot | 0 0 34 | 0 0 34 |
| Australian.....                 | foot | 0 0 34 | 0 0 34 |
| Agony, Cuba.....                | foot | 0 0 34 | 0 0 34 |
| St. Domingo, cargo average..... | foot | 0 0 44 | 0 0 54 |
| Mexican.....                    | foot | 0 0 44 | 0 0 44 |
| Tobacco.....                    | foot | 0 0 44 | 0 0 54 |
| Honduras.....                   | foot | 0 0 44 | 0 0 54 |
| or, Turkey.....                 | foot | 5 0 0  | 12 0 0 |
| Alut, Italian.....              | foot | 0 0 44 | 0 0 6  |

| METALS.                       |     |         |         |
|-------------------------------|-----|---------|---------|
| or-Bar, Welsh, in London..... | ton | 4 17 6  | 5 0 0   |
| Best selected.....            | ton | 4 7 6   | 4 10 0  |
| Staffordshire, in London..... | ton | 5 5 0   | 6 15 0  |
| UPPER.                        |     |         |         |
| British, cake and ingot.....  | ton | 75 0 0  | 78 0 0  |
| Best selected.....            | ton | 78 0 0  | 77 0 0  |
| Sheets, strong.....           | ton | 80 0 0  | 0 0 0   |
| Chili, bars.....              | ton | 81 15 0 | 82 0 0  |
| Snow Metal.....               | lb. | 0 0 74  | 0 0 74  |
| DOWN.                         |     |         |         |
| Pig, Spanish.....             | ton | 13 0 0  | 0 0 0   |
| English, common brands.....   | ton | 13 0 0  | 13 7 6  |
| Sheet, English.....           | ton | 14 5 0  | 14 10 0 |
| SPECIAL.                      |     |         |         |
| Silesian, special.....        | ton | 17 6 12 | 17 12 6 |
| Ordinary brands.....          | ton | 17 5 0  | 17 7 6  |
| SPECIAL.                      |     |         |         |
| Straits.....                  | ton | 93 0 0  | 0 0 0   |
| Australian.....               | ton | 93 0 0  | 0 0 0   |
| English Ingots.....           | ton | 98 0 0  | 0 0 0   |
| SPECIAL.                      |     |         |         |
| English sheet.....            | ton | 18 10 0 | 19 10 0 |

HORNSEY.—For making-up private roads, for the Hornsey Local Board. Mr. T. De Courcy Meade, Engineer and Surveyor:—

|                                                                                                                                                                                                | A.     | B.     | C.     | D.     | E.    | F.     | G.   | H.   | I.   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|--------|-------|--------|------|------|------|
|                                                                                                                                                                                                | £      | £      | £      | £      | £     | £      | £    | £    | £    |
| Victoria Stone Co., Kingsland-road.....                                                                                                                                                        | 2,590  | 3,646  | 3,853  | 3,239  | 1,132 | 4,142  | 980  | 977  | 918  |
| T. Adams, Kingsland.....                                                                                                                                                                       | 2,407  | 3,188  | 3,443  | 2,904  | 1,027 | 3,788  | 811  | 814  | 793  |
| Asquith & Son, Finsbury Park.....                                                                                                                                                              | 2,357  | 3,109  | 3,398  | 2,827  | 987   | 3,715  | 821  | 818  | 801  |
| Rogers & Son, Notting-hill.....                                                                                                                                                                | 2,122  | 2,810† | 3,181† | 2,438† | 813†  | 3,112† | 702† | 702† | 651† |
| Mowlam & Co., Westminster.....                                                                                                                                                                 | 2,057‡ | 2,993  | 3,125  | 2,559  | 988   | 3,492  | 787  | 787  | 787  |
| J. Pacey, Hornsey.....                                                                                                                                                                         | 2,057‡ | 2,993  | 3,125  | 2,559  | 988   | 3,492  | 787  | 787  | 787  |
| Dunmore, Hornsey.....                                                                                                                                                                          | 2,057‡ | 2,993  | 3,125  | 2,559  | 988   | 3,492  | 787  | 787  | 787  |
| * A. Haselmere-road, B. Cothurst-road, C. Syden-road, D. Lausanne-road, E. Wightman-road (2nd section), F. Wightman-road (3rd section), G. Bargoyn-road, H. Umfrville-road, I. Claremont-road. |        |        |        |        |       |        |      |      |      |
| † Accepted.                                                                                                                                                                                    |        |        |        |        |       |        |      |      |      |
| ‡ Accepted.                                                                                                                                                                                    |        |        |        |        |       |        |      |      |      |

| OILS.                       |    |    |    |
|-----------------------------|----|----|----|
|                             | £. | s. | d. |
| Lined.....                  | 18 | 7  | 6  |
| Coconut, Coochin.....       | 24 | 10 | 0  |
| Ceylon.....                 | 22 | 6  | 0  |
| Palm, Lagos.....            | 20 | 10 | 0  |
| Rapeseed, English pale..... | 28 | 10 | 0  |
| do. brown.....              | 25 | 0  | 0  |
| Cottonseed, refined.....    | 20 | 15 | 0  |
| Tallow and Oleine.....      | 25 | 0  | 0  |
| Lubricating, U.S.....       | 4  | 0  | 0  |
| do. refined.....            | 7  | 0  | 0  |
| TURPENTINE—                 |    |    |    |
| American, in casks.....     | 1  | 8  | 9  |
| TAX—                        |    |    |    |
| Stockholm.....              | 0  | 16 | 0  |
| Archangel.....              | 0  | 10 | 0  |

HORNSEY.—For erecting stabling and cart-sheds, for the Hornsey Local Board. Mr. T. De Courcy Meade, Engineer and Surveyor:—

|                                       | A.   | B.   | C.   | D.   |
|---------------------------------------|------|------|------|------|
|                                       | £    | £    | £    | £    |
| Chas. Wall, Chelsea.....              | 2388 | 2802 | 2120 | 2170 |
| Wilmot & Son.....                     | 987  | 580  | 122  | 157  |
| Hitchin.....                          | 973  | 570  | 154  | 175  |
| J. W. Dixon, Highgate.....            | 925  | 552  | 131  | 163  |
| E. Kerry, Highgate.....               | 895  | 505  | 111  | 145  |
| Matlock, Finsbury Park.....           | 840  | 540  | 97   | 132  |
| Stimpson, Kensington.....             | 770  | 458  | 109  | 138  |
| Rudd & Son, Grant-ham (accepted)..... |      |      |      |      |

HACKNEY.—For sundry repairs to the New Gravel Pit Church and school buildings at Hackney, for the Committee:—

|                         | Church. | School Buildings. |
|-------------------------|---------|-------------------|
|                         | £       | £                 |
| Fuller.....             | 272     | 0                 |
| Coldwells.....          | 248     | 0                 |
| Hosking.....            | 239     | 0                 |
| Kilby & Gayford.....    | 234     | 0                 |
| McCormick & Son.....    | 227     | 0                 |
| Bartrum (accepted)..... | 220     | 0                 |

# CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                               | By whom required.                          | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------------------------|--------------------------------------------|-----------------------------------|--------------------------|-------|
| Three Houses for Coastguard, Cornwall.....                  | Admiralty                                  | Official.....                     | August 28th              | ii.   |
| Whiting, Whitewashing, &c.....                              | St. Marylebone Grdms.                      | H. Saxon Snell & Son.....         | Sept. 3rd                | ix.   |
| Alterations, &c., to 107 and 108, Cheyne-walk, Chelsea..... | Finchley Local Board.....                  | G. W. Brunell.....                | do.                      | xi.   |
| Grades and Footpaths, New Cemetery.....                     | F. Cole.....                               | J. Buchan.....                    | do.                      | x.    |
| Iron Fencing, Gates, &c., New Cemetery.....                 | Grimsby U. S. A.....                       | do.....                           | do.                      | ix.   |
| Chapels, Lodges, &c., New Cemetery.....                     | do.....                                    | E. W. Farebrother.....            | do.                      | ix.   |
| Broken Granite and Flints.....                              | Dover Town Council.....                    | Official.....                     | Sept. 4th                | xi.   |
| Gravel Sheds, Station.....                                  | Gr. Western Railway Co.....                | do.....                           | do.                      | x.    |
| Reinforcing Windmill-road.....                              | Brentford Local Board.....                 | — Lacey.....                      | do.                      | x.    |
| Overing over Brook, &c.....                                 | do.....                                    | do.....                           | do.                      | x.    |
| Painting Brickwork.....                                     | Holborn Union.....                         | H. S. Snell & Son.....            | Sept. 5th                | ix.   |
| Ream-Heating Apparatus, &c.....                             | St. Luke's (Chelsea) Vcs.....              | A. & C. Harrison.....             | do.                      | ix.   |
| Alteration of Hotel, Newcastle-on-Tyne.....                 | North Eastern Ry.....                      | do.....                           | do.                      | ix.   |
| Alteration to Station, Newcastle-on-Tyne.....               | County of Norfolk.....                     | T. H. P. Heslop.....              | Sept. 7th                | ii.   |
| Building Bridge.....                                        | Hornsey Local Board.....                   | T. De Courcy Meade.....           | do.                      | ix.   |
| Reinforcing Works.....                                      | St. Luke's (Milit.) Vcs.....               | Official.....                     | Sept. 10th               | ix.   |
| ew Crypt Grammar School.....                                | Gloucester United.....                     | Medland & Son.....                | do.                      | x.    |
| ew Post-Office at South Shields.....                        | Endowed Schools.....                       | Official.....                     | Sept. 12th               | ix.   |
| Buildings.....                                              | Com. of H. M. Works.....                   | H. D. Appleton.....               | do.                      | ix.   |
| Waterworks.....                                             | Epsom Union.....                           | A. F. Phillips.....               | do.                      | x.    |
| Works at Weymouth Harbour.....                              | Stoney Stratford R.S.A.....                | W. B. Morgan.....                 | Sept. 19th               | ii.   |
| Waterworks.....                                             | Weymouth & Melcombe Regis Corporation..... | Russell Austin.....               | August 31st              | ix.   |
| Waterworks.....                                             | Hertford R. S. A.....                      | A. Waterhouse.....                | Not stated.....          | x.    |
| Waterworks.....                                             | Messrs. F. Gordon & Co.....                | J. W. Chapman.....                | do.                      | x.    |
| Waterworks.....                                             | The Committee.....                         |                                   |                          |       |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.      | By whom Advertised.      | Salary.         | Applications to be in. | Page. |
|-----------------------------|--------------------------|-----------------|------------------------|-------|
| Work of Works.....          | Hornsey Local Board..... | Not stated..... | August 20th            | xiv.  |
| Inspector and Surveyor..... | Cardiff U. R. S. A.....  | 150†.....       | Sept. 7th              | xiv.  |

## TENDERS.

[Communications for insertion under this heading must be not later than 12 Noon on Thursdays.]

|                                                                                                                                                                 |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| ASHTEAD.—For the erection of a house in Woodfield, Ashstead, Surrey, for Mr. Henry Furze. Mr. Lionel Hildred, architect, 8, Great James-street, Bedford, W.C.:— |            |
| Gregory & Co., Clapham.....                                                                                                                                     | £1,894 0 0 |
| Turle & Appleton, Clapham.....                                                                                                                                  | 1,638 0 0  |
| J. Jeal, Epsom.....                                                                                                                                             | 1,600 0 0  |
| S. Harde, Ewell.....                                                                                                                                            | 1,471 19 6 |
| W. J. Chivington, Epsom.....                                                                                                                                    | 1,435 0 0  |
| W. H. Batches, Leatherhead.....                                                                                                                                 | 1,285 0 0  |
| J. Hasnam, Ashstead.....                                                                                                                                        | 1,280 0 0  |
| H. Skilton, Leatherhead.....                                                                                                                                    | 1,268 7 0  |

|                                                                                                                                                                                                        |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| ASHTON (Dorset).—For rebuilding portion of the buildings at Ashton Farm, near Dorchester, for the Right Hon. Lord Fitzhardinge. Mr. B. H. Ranford, estate surveyor, Berkeley Castle, Gloucestershire:— |          |
| J. Wellspring, Great Western-road, Dorchester (accepted).....                                                                                                                                          | £234 0 0 |

|                                                                                                                                                                                                 |          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| BERKELEY.—For improvements and decoration at Lynch, on the Berkeley Castle Estate, for the Right Hon. Lord Fitzhardinge. Mr. B. H. Ranford, estate surveyor, Berkeley Castle, Gloucestershire:— |          |
| W. & J. Jouchard.....                                                                                                                                                                           | £125 0 0 |
| J. Nicholls.....                                                                                                                                                                                | 118 0 0  |
| H. & J. Knight.....                                                                                                                                                                             | 109 0 0  |
| E. Gregory & Sons, Berkeley.....                                                                                                                                                                | 102 10 0 |
| Accepted.                                                                                                                                                                                       |          |

|                                                                                                         |          |
|---------------------------------------------------------------------------------------------------------|----------|
| CAMBERWELL.—For alterations and additions to Heathcote, Grove Park, Camberwell, for Mr. R. W. Edwards:— |          |
| J. Bullers, Bermondsey.....                                                                             | £759 0 0 |
| Revised Tender (accepted).....                                                                          | 546 0 0  |

CHELMSFORD.—For the construction of reservoir, water-tower, and other works, at Chelmsford, Essex, for the Local Board. Mr. Chas. Perrow, engineer. Quantities by Messrs. R. L. Curtis & Sons:—

|                                 |            |
|---------------------------------|------------|
| For Contracts 1, 2, and 3.      |            |
| Longley (accepted).....         | £5,091 0 0 |
| For Contract 4.                 |            |
| J. & S. Roberts (accepted)..... | 1,777 13 8 |

|                                                                                                                                                                |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| CLETHORPES (Lincolnshire).—For kerbing, channeling, and macadamising the public road between New Cle and Clethorpes. Mr. W. H. Radford, engineer, Nottingham:— |            |
| G. Webster, Sheffield.....                                                                                                                                     | £3,915 8 0 |
| A. Ward, Sheffield.....                                                                                                                                        | 3,900 0 0  |
| A. Rees, Bramley, near Leeds.....                                                                                                                              | 3,812 10 7 |
| Sterling & Swan, Manchester.....                                                                                                                               | 3,850 0 0  |
| T. Smart, Nottingham.....                                                                                                                                      | 3,397 0 0  |
| E. Enderby & Co., Grimsby.....                                                                                                                                 | 3,383 0 0  |
| W. Gordon, Burton Joyce.....                                                                                                                                   | 3,320 0 0  |
| J. Copley, Lincoln.....                                                                                                                                        | 3,185 8 3  |
| A. F. James, Clethorpes.....                                                                                                                                   | 3,043 0 0  |
| Home & King, London.....                                                                                                                                       | 3,029 4 0  |
| E. & J. Holmes, Clay Cross.....                                                                                                                                | 3,000 0 0  |
| D. Barry, Radcliffe-on-Trent.....                                                                                                                              | 2,989 16 0 |
| Simpson & Malone, Hull.....                                                                                                                                    | 2,984 3 6  |
| J. Tomkinson, Derby.....                                                                                                                                       | 2,832 0 0  |
| E. Clarke & Son, Sheffield.....                                                                                                                                | 2,824 17 6 |
| J. & B. Horton, Lincoln.....                                                                                                                                   | 2,824 0 0  |
| J. Vickers, Nottingham.....                                                                                                                                    | 2,807 0 0  |
| C. Green, Rotherham.....                                                                                                                                       | 2,724 10 0 |
| Jas. Brown, Grimsby (accepted).....                                                                                                                            | 2,690 0 0  |

|                                                                                                                    |            |
|--------------------------------------------------------------------------------------------------------------------|------------|
| CRAYEN ARMS (Salop).—For new Corn Exchange and Assembly-rooms at Crayen Arms, Salop. Mr. Thomas Evans, architect:— |            |
| D. & C. Jones, Gloucester.....                                                                                     | £1,644 0 0 |
| E. Price, Shrewsbury.....                                                                                          | 1,495 0 0  |
| C. T. Smith, Bromley.....                                                                                          | 1,494 0 0  |
| J. Davis, Shrewsbury.....                                                                                          | 1,480 0 0  |
| Wesle & Co., Ludlow.....                                                                                           | 1,394 0 0  |
| H. Milward, Leominster.....                                                                                        | 1,388 0 0  |
| J. Williams, Knighton.....                                                                                         | 1,000 0 0  |

|                                                                                                                                                                          |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| LONDON.—For painting and repairs to exterior of infirmary wing, St. Pancras Workhouse, St. Pancras-road, N.W., for the Guardians of the Poor of St. Pancras, Middlesex:— |          |
| J. & H. Bangs.....                                                                                                                                                       | £206 0 0 |
| S. R. Lambie.....                                                                                                                                                        | 189 0 0  |
| J. Killick, London.....                                                                                                                                                  | 187 10 0 |
| S. W. Eastwell.....                                                                                                                                                      | 180 0 0  |
| Bears Bros. (accepted).....                                                                                                                                              | 168 0 0  |

|                                                                                                                                           |            |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For new front and sundry alterations at the "Blue Coat Boy," Norton Folgate, for Mr. T. J. Hulme. Mr. W. T. Farthing, architect:— |            |
| Green & Lee.....                                                                                                                          | £1,410 0 0 |
| S. R. Lambie.....                                                                                                                         | 1,374 0 0  |
| Allen & Sons.....                                                                                                                         | 1,354 0 0  |
| Leslie & Co.....                                                                                                                          | 1,346 0 0  |
| Pickersgill & Smith.....                                                                                                                  | 1,324 0 0  |
| Spencer & Co.....                                                                                                                         | 1,341 0 0  |
| Balsam Bros.....                                                                                                                          | 1,200 0 0  |

|                                                                                                                         |            |
|-------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For additions, &c., at "The Sun," Askew-road, Shepherd's Bush, for Mr. E. Wash. Mr. W. T. Farthing, architect:— |            |
| S. Hayworth & Sons.....                                                                                                 | £1,707 0 0 |
| Goad & Brand.....                                                                                                       | 1,637 0 0  |
| Burns & Sons.....                                                                                                       | 1,637 0 0  |
| S. R. Lambie.....                                                                                                       | 1,629 0 0  |
| Pickersgill & Smith.....                                                                                                | 1,585 0 0  |
| S. Goad & Co.....                                                                                                       | 1,581 0 0  |
| Leslie & Co.....                                                                                                        | 1,575 0 0  |
| Balsam Bros.....                                                                                                        | 1,550 0 0  |
| Spencer & Co.....                                                                                                       | 1,540 0 0  |



LONDON.—For rebuilding the "Coach and Horses" Tavern, Nos. 323 to 325, Strand, for Messrs. G. Warman & Co. Mr. W. T. Farthing, architect.—

|                       |            |
|-----------------------|------------|
| Patman & Fotheringham | £9,943 0 0 |
| Leslie & Co.          | 6,818 0 0  |
| W. Skirvener & Co.    | 6,697 0 0  |
| Allen & Sons          | 6,689 0 0  |
| T. L. Green           | 6,679 0 0  |
| Gould & Brand         | 6,533 0 0  |
| S. R. Lambie          | 6,550 0 0  |
| Green & Lee           | 6,512 0 0  |
| Spencer & Co.         | 6,475 0 0  |
| Balham Bros.          | 6,379 0 0  |
| Eirk & Randall        | 6,330 0 0  |
| Jackson & Todd        | 6,145 0 0  |

LONDON.—For sundry alterations and bar-fittings at the "Greyhound Tavern," Fulham Palace-road, for Mr. Dean. Mr. G. Treacher, architect, 23, Carter-lane. Quantities supplied:—

|                                   |            |
|-----------------------------------|------------|
| Cruckers                          | £2,140 0 0 |
| Turtle & Appleton                 | 2,125 0 0  |
| Hy. Smith                         | 1,997 0 0  |
| W. H. Smith                       | 1,987 0 0  |
| Bright                            | 1,965 0 0  |
| Ashford                           | 1,820 0 0  |
| Spencer                           | 1,820 0 0  |
| J. Beale, Westminster Bridge-road | 1,747 0 0  |

Accepted.

LONDON.—For new front and other works to the "Trunk's Head," Grange-road, Brompton. Messrs. Geo. Elkington & Son, architect:—

|                    |          |
|--------------------|----------|
| Almond             | £172 0 0 |
| Bullers (accepted) | 183 0 0  |
| Russell (informal) | 189 0 0  |

LONDON.—For new sheds, &c., at the parish-yard, Wandsworth-road, for the Clapham Board of Works. Mr. A. Southam, surveyor. No quantities:—

|                               |          |
|-------------------------------|----------|
| L. Whitehead & Co. (accepted) | £459 0 0 |
|-------------------------------|----------|

[Seven tenders.]

LONDON.—For alterations and additions at 54, Bedford-gardens, Kensington. Mr. B. E. Ferrey, architect. Messrs. Northcroft, Son, & Neighbour, surveyors:—

|                    |          |
|--------------------|----------|
| Scott              | £739 0 0 |
| Lang & Sons        | 762 0 0  |
| Nash               | 730 0 0  |
| Foxley & Co.       | 730 0 0  |
| L. Whitehead & Co. | 895 0 0  |

LONDON.—For alterations to provision stores, 273 & 281, Edgware-road, W., for Mr. W. Bower. Mr. Thos. Durran, architect, 44, Upper Baker-street, S.W.:—

|                   |            |
|-------------------|------------|
| Stevenson         | £1,170 0 0 |
| Lovell            | 1,150 0 0  |
| Drysdale          | 1,139 0 0  |
| Turtle & Appleton | 882 0 0    |
| Higgs (accepted)  | 927 0 0    |

LONDON.—For alterations, &c., required to be done to the "Duke of Abercorn" public-house, High-street, Kensington, for Mr. S. Raven. Mr. H. I. Newton, architect, 17, Queen Anne's-gate, Westminster, S.W.:—

|                              |            |
|------------------------------|------------|
| Eirk & Randall, Woolwich     | £1,516 0 0 |
| Jackson & Todd, Hackney      | 1,328 0 0  |
| S. Golden, Bryanston-square  | 1,313 0 0  |
| S. R. Lambie, Kenish Town    | 1,299 0 0  |
| T. Haylock, Piccadilly       | 1,254 0 0  |
| H. & E. Lea, Regent's-street | 1,193 0 0  |

Accepted.

LONDON.—For covered lawn-tennis-courts, West Kensington, for the Directors of the Queen's Club, Limited. Mr. Alexander Payne, architect, 3, Storey's-gate, S.W. Quantities supplied:—

|                                            |            |
|--------------------------------------------|------------|
| General Work.                              |            |
| Ashford & Co.                              | £3,643 0 0 |
| Patman & Fotheringham                      | 3,423 0 0  |
| Army & Navy Auxiliary Co-operative Society | 3,337 0 0  |
| Longmore & Burge                           | 3,140 0 0  |
| Peto Bros.                                 | 3,102 0 0  |
| Stimpson & Co.                             | 3,100 0 0  |
| Hall, Bedford, & Co.                       | 2,963 0 0  |
| Perry & Co.                                | 2,993 0 0  |
| T. L. Green (accepted)                     | 2,983 0 0  |

|                                  |            |
|----------------------------------|------------|
| Ironwork.                        |            |
| R. Moreland & Sons               | 1,446 0 0  |
| Army & Navy Co-operative Society | 1,401 0 0  |
| A. Handyside & Co., Limited      | 1,329 0 0  |
| Mrs. T. Shaw & Co.               | 1,296 0 0  |
| H. Young & Co.                   | 1,195 0 0  |
| St. Pancras Ironworks            | 1,159 0 0  |
| Rowson, Drew, & Co.              | 1,095 0 0  |
| John Lysons Limited (accepted)   | 1,084 18 0 |

LONDON.—For new stage and alterations in basement at Toole's Theatre, Strand. Mr. J. J. Thomson, architect. Messrs. Northcroft, Son, & Neighbour, surveyors:—

|                               |          |
|-------------------------------|----------|
| L. Whitehead & Co. (accepted) | £208 0 0 |
|-------------------------------|----------|

LONDON.—For the erection of a warehouse, Bethnal-green, for Mr. R. Letchford. Messrs. Hannamack & Lambert, architects:—

|                   |             |
|-------------------|-------------|
| Drew & Cadman     | £5,043 10 0 |
| J. Sargent        | 4,687 0 0   |
| J. Boyce          | 4,414 0 0   |
| Yardley & Son     | 4,413 0 0   |
| C. Co. (accepted) | 4,298 0 0   |
| Lascelles & Co.   | 4,280 0 0   |
| F. & F. J. Wood   | 4,174 0 0   |

MORTLAKE.—For granite and York kerling and channelling, for the Mortlake District Highway Board. Mr. J. Medworth, surveyor:—

|                                                |                           |
|------------------------------------------------|---------------------------|
| W. H. Wheeler, 11, Queen Victoria-street, E.C. | Accepted at per schedule. |
|------------------------------------------------|---------------------------|

RICKMANSWORTH.—For the erection of a residence, Charleywood, near Rickmansworth, for Mrs. J. H. Barnes. Mr. W. H. Syme, architect, Watford:—

|                           |            |
|---------------------------|------------|
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|---------------------------|------------|

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|                         |           |
|-------------------------|-----------|
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| C. Reason               | 499 10 0  |
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|                        |           |
|------------------------|-----------|
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| T. W. Jones, Beckenham | 717 0 0   |

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# The Builder.

VOL. LV. No. 78.

SATURDAY, SEPTEMBER 1, 1883.

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### Distribution of Authority in County Areas.



THE conditions of government which give the greatest liberty consistent with order take a good deal of finding out. Neither absolute control, on the one hand, nor unrestricted liberty, on the other, can be enjoyed in this country, or in any other; and statesmen have to find a medium condition of practical working in which people can live without injury to one another. English statesmen have perhaps, in general, as successful in the search for this medium condition of government as any country—perhaps more so; and, though it can hardly be said that it has yet been positively attained, we may at least say that the condition of liberty with order has been attained in a degree sufficient to warrant us in the future, even without respect to the Local Government Act, which has now received the royal assent, and by which it is effected that representatives of each county in England and Wales shall take upon themselves—thus relieving the Imperial Government from—as much control as possible. This system of government may have the effect, in course of time, of lessening the necessity of any control at all; for the exercise of such control as is consistent with the amount of liberty demanded is not a measure but a duty, and naturally tends towards its own reduction to a minimum, and eventually to the extinction of control altogether, as being no longer necessary. But at present authority cannot be wholly withdrawn, and the new Act only transfers the administrative duties in counties from the magistrates to new authorities to be created for the people of each county. The authority of the Crown in a county is committed chiefly to two persons, the Lord Lieutenant and the Sheriff, the first for military and the second for civil purposes. The Lord Lieutenant has now but little concern with military business, except that of the ordering of the militia of the county, but another office, distinct one, is usually conferred upon him, under the authority of which he appoints the Clerk of the Peace. He also, as Lord Lieutenant, nominates the county magistrates, and their appointment by the Lord Chancellor. These meet four times a year, constituting at

those times the Court of Quarter Sessions. The magistrates at Quarter Sessions sit for two distinct purposes, judicial and administrative. Their jurisdiction in criminal cases extends to all offences except a few of the worst, which are reserved for trial before Judges of the Supreme Courts, who attend a circuit of county towns for that purpose. Except these, the magistrates at Quarter Sessions, or General Sessions of the Peace, are the judicial authority in each county, and they also conduct the administrative and financial business, and take charge of the bridges, the court-houses and shire-halls, and of all public buildings and the county property generally; and by special appointment of sessions in divisions of the county, they grant licences for public-houses, locomotives on roads, slaughter-houses, and to persons requiring licences for various occupations; and they provide industrial and reformatory schools, protect wild fowl and fish, do other administrative work, appoint various officers, and levy the county rate upon the several parishes.

The distance of a Quarter Sessions town from most parts of the county is so considerable that to accommodate people and bring justice nearer home the county is divided into petty-sessional divisions, in each of which two or more magistrates hold more frequent meetings. To constitute a petty-sessional division, at least five magistrates must reside within it. The whole area of England and Wales is 37,239,351 acres. If we take from this the town areas, or, rather, the areas of the boroughs, the remainder will be the area of the counties proper, so called now that under the new Act certain large boroughs are constituted counties of themselves under the name of county boroughs; but in the deductions we shall make, we take, besides the county boroughs, all those which have a separate Commission of the Peace, and in most of which a Court of Quarter Sessions is held, but not in all. Having deducted the town area from the area of the county in each case, we get the large country area which is divided into petty-sessional divisions, including the small towns. It was originally proposed by the Local Government Bill to divide these country areas into districts according to population, but several independent members of the House of Commons pointed out that in apportioning the county into districts, each returning one member to the County Council, the area of each district should be regarded as well as the population, and the following

particulars will show how much that is needed. The Bill was accordingly amended in this respect, and those who are charged with the duty of marking out the boundaries of the new districts are directed by the Act to take into account the area as well as the population of each.

To begin with the most northern counties, Northumberland has an area, after deducting that of the towns, as before mentioned, of 5,520 acres per thousand of the population. Durham has an area, after deducting town areas, of 1,340 acres per thousand of the country population. Cumberland has an area which is at the rate of 4,510 acres per thousand; and Westmoreland an area at the rate of 9,860 acres per thousand of the population. Yorkshire has—taking the three Ridings together—an area of 2,540 acres per thousand.

In the North Midland counties: Derbyshire has an area which is at the rate of 1,870 acres per thousand of the country population; Nottinghamshire, 2,810 acres; Leicestershire, 2,560 acres; Rutland, 4,420; Lincolnshire, 4,970 acres per thousand.

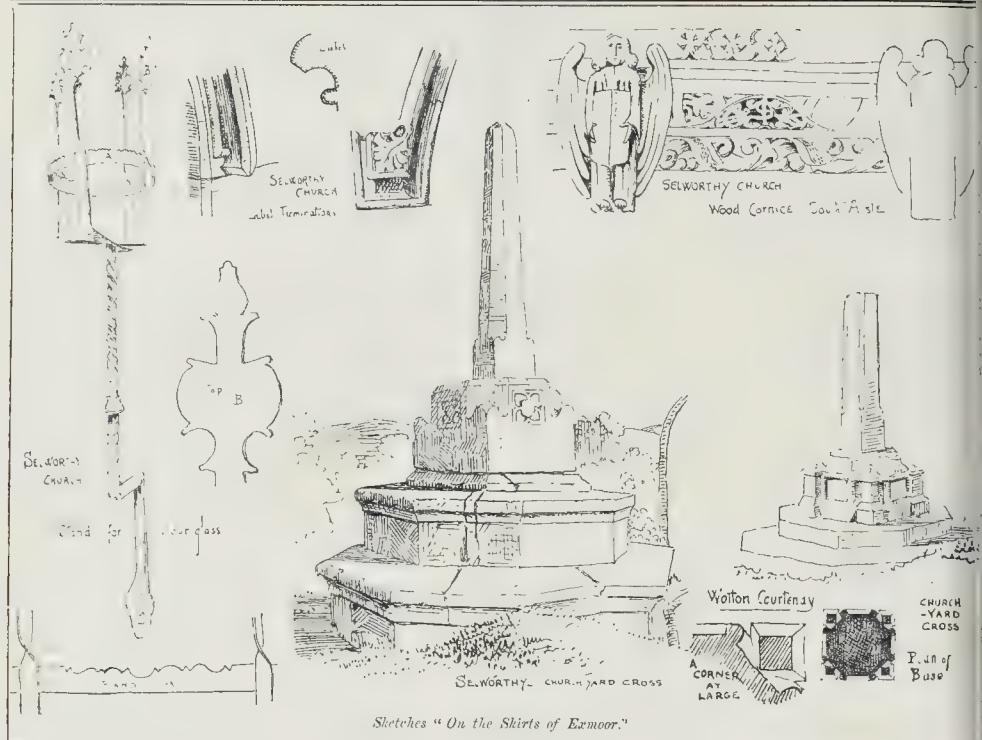
In the West Midland counties: Gloucestershire has an area of 2,390 acres per thousand of its country population; Herefordshire, 5,460 acres; Shropshire, 4,530 acres per thousand. Staffordshire has, after deducting the town areas, an area of one acre per head of the population. Worcestershire has, similarly, an area of 1,740 acres per thousand. Warwickshire has 2,190.

In Monmouthshire and Wales: Monmouthshire has an area of 2,140 acres per thousand of its country population; Glamorganshire, 1,400 acres; Carmarthenshire, 5,200 acres; Pembroke, 5,760 acres; Cardiganshire, 7,160 acres; Breconshire, 8,880 acres; Radnorshire, 11,750 acres; Montgomeryshire, 8,110 acres; Flint, 2,120 acres; Denbighshire, 4,400; Merionethshire, 7,390 acres; Carnarvonshire, 3,340 acres; and Anglesey, 3,760 acres.

In the North-Western counties: Cheshire has an area, reckoned in the same way, of 1,650 acres per thousand of population; but Lancashire has a country population of 1.87 per acre.

In the South-Western counties: Devonshire has an area of 4,090 acres per thousand of population, deducting the areas and populations of towns as before; Cornwall, 3,060 acres; Somersetshire, 2,660 acres; Dorsetshire, 4,170 acres; and Wiltshire, 3,690 acres.

In the South Midland counties: Oxford-



Sketches "On the Skirts of Exmoor."

shire has an area of 3,420 acres per thousand; Buckinghamshire, 2,910; Northamptonshire, 2,860; Huntingdonshire, 3,550; Bedfordshire, 2,790; Cambridgeshire, 3,520; Hertfordshire, 2,190 acres. Middlesex is mostly a town area.

In the South-Eastern counties: Surrey has an area of 1,510 acres, Kent 1,150, Sussex 2,820, Hampshire 2,900, and Berkshire 3,290 acres, per thousand of the country population.

In the Eastern Counties: Essex has an area, deducting town areas and populations, of 1,820 acres per thousand of the population; Norfolk, 4,500 acres; Suffolk, 3,130 acres.

It was very proper therefore, seeing these great differences of area per thousand of the population, that the Local Government Bill should have been amended in respect of area, whatever may be said of the other amendments which have been made, some of which, we believe, were not improvements, but the contrary. But, if the same population had been taken in each district, the carrying out of the Act in some of the counties would have been very inconvenient, to say the least of it; and, even doing the best they can, when the divisions come to be made, there will be an inconveniently large area in some of the counties. The Court of Quarter Sessions is to divide the county area before November 8 next, excepting the larger boroughs, into districts, each of which is to return one member to the County Council. In pursuance of the powers conferred upon them by the Act, the Local Government Board have issued orders determining the number of the county councillors for each county, and their apportionment between the boroughs and the rest of the county.

The judicial business of a county remains with the justices of the peace, but the administrative and financial business is to be transferred to the new County Councils. If to these new bodies suitable persons be elected, and if the administration of public business be carried on satisfactorily, the transfer to them of the sanitary business of the Boards of Guardians may hereafter be made.

The whole of England and Wales, it is well known, is divided at present into sanitary areas of two definitions, Urban and Rural, the Urban districts being the municipal boroughs, the Local Board districts, and those formed under special Acts of Parliament and presided over by Town Commissioners; while the Rural sanitary districts are, in general, coextensive with the unions presided over by the Boards of Guardians. These include, in many cases, urban areas of considerable extent, but not defined as Urban, and to which the provisions of the Public Health Act, 1875, in respect of Urban districts, do not apply. The new Act intends to disturb existing areas of sanitary administration as little as possible; indeed, intends purposely to leave them as they are, but the Urban districts in the Rural areas will each form a division of the county government if it has sufficient population, or be combined with others in forming one; or, perhaps, be divided, if containing a greater population than is sufficient to return one member to the County Council; and the Unions, or present Rural sanitary districts will be divided into wards, under the name of electoral divisions.

A county borough will in all respects be apart from the county proper, and will be divided into electoral divisions by the Town Council. In the rest of the county the electoral divisions will be made by the magistrates at quarter sessions, except in the case of boroughs returning more than one councillor, in which case the Town Council is to make the divisions.

The number of county councillors for each county having been determined by the Local Government Board, and stated to the local authorities, it will be in most cases a task of great labour for the Chairmen of Quarter Sessions and the Clerks of the Peace to apportion them and define the electoral divisions of the counties; that is, if done with judgment and a due regard to the convenience of electors, as well as to area. Town Councils will have an easier task, but in the larger areas there are difficulties which do not arise in towns.

#### ON THE SKIRTS OF EXMOOR.

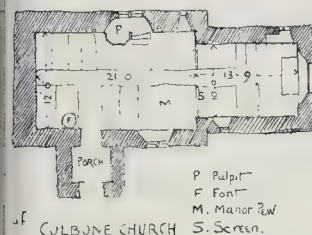
THE architecture of a district which is chiefly famous by its other merits is never without interest. Men must have had dwellings, the must (in ancient days, at least) have gone to church; some of them would be powerful and would fortify their houses, some would be pious and adorn their churches; while, in later days, when the need for new castles and churches grew less pressing, they bestowed the wealth which once flowed into ecclesiastical coffers upon the adornment of their own homes. Exmoor itself offers but little architecture of any kind, but where its low and lofty undulations approach the Bristol Channel at its north-east extremity, the hand of man has conquered the sterility of the soil; the bright yellow of the cornfield runs up the sides of the irregular hills in every direction; biting deep into the green and brown of moorland; and here, amid the valleys, or on the few flat places by the sea, or half-way up the hills, are to be found many villages, and sundry small towns. It must be confessed that the vernacular architecture of the part of the world exhibits very little detail. The materials were not kindly, and money probably was scarce, for the stony ribs of Exmoor are widely different from the rich pasturage land of the Huntspill Level, and would afford but a bare subsistence where the latter would grant a handsome competence. The cottages are plain white-washed structures; nevertheless, from the irregularity of their disposition, and the geniality of the climate, which allows shrubs and flowers to grow in great luxuriance in their little gardens, they combine to form villages of great beauty, the charm of which, however, appeals rather to the painter than to the architect. But still, architecture is to be found with but little seeking, and every church, at any rate, is worth a visit.

Some of the churches are important buildings, such as those at Dunster and Minehead; the former of which derives its character from having been partly a conventual church,



the latter owes its size to the prosperity of the town, which was in former days a considerable seaport. Other churches owe their size to private munificence, whilst others, again, have nothing much to boast of, and a hard work to keep from decay what they have.

One of the most curious churches in the neighbourhood is that of Culbone. It serves a village, but only a scattered parish. It is situated in a wooded ravine which cuts into the mighty side of Exmoor, where it descends abruptly to the waters of the Bristol Channel. Some 300 ft. or 400 ft. above the sea a plateau finds room for itself in this ravine, and on the plateau are a tiny church and churchyard. To the east and the west woods rise steeply almost from the boundary of the churchyard. Southwards the ground ascends more gradually, while northwards the ground falls at once to the rocky, pebbly shore. The church itself, of which we here give a sketch plan, is a rude structure,



It contains rude work, but it is nearly all medieval. The nave is 21 ft. long and 12 ft. 6 in. wide, the chancel is 13 ft. 9 in. long and 10 ft. 6 in. wide. The accommodation is for twenty-five persons, including parson and clerk. Dividing the nave is a mighty nave from the chancel is a sixteenth-century oak screen. In the nave are a few bench-ends of corresponding date, and a closed pew of the time of James I. for the lord of the manor: there is also a stone altar. The roof of the nave is original, but the chancel seems to have been rebuilt. The appointments of the place are tolerably complete, but it must be confessed that the workmanship is rough. The idea is good enough, but the way in which it is carried out resembles a schoolboy's copy of a copper-plate heading. It should be remembered that until recently there was no carriage-road to the church at all—nothing better than a bridle-path for clock-horses. It is, therefore, not so wonderful to find the work rough as to find it there at all, and many a church of greater pretensions (few, indeed, could have less) is not so rich in Medieval features as this tiny structure at hange hidden in the fringe of Exmoor. The nearest village to Culbone is Porlock, a quaint place of very ancient date, but offering little for architectural sketching. The church itself is somewhat dreary, and but for its monuments would have few attractions. Of course it has its history, written in fragments of various dates,—and to decipher such writing, wherever it may occur, is a pastime affording great interest, but the interest is not akin to that roused by a beautiful piece of detail. The monuments at Porlock are three. First there is a cross-legged warrior in a recess; but there is a certain amount of sameness about cross-legged warriors in recesses, so that the visitor is more likely to find himself in the chancel, where there is a finely-pannelled altar-tomb, and at the east end of the nave, where is a very elaborate tomb to a knight and his lady. There are no means of identifying the founder of this fine monument supplied by the work itself, but from other sources it has been found to commemorate John, Baron Harrington of Aldingham, who died in 1417, and his wife, who died in 1472. The workmanship is of a high order of merit, and the detail and ornamentation are most delicate; unfortunately, rough usage has caused much mutilation, and the bodily removal of the whole tomb from its original site has led to the crippling of the canopy. Fine as is the

work here, it must nevertheless rank second to that lavished on the monument to Ralph Greene, in Lowick Church, Northamptonshire, who died about 1420.

A much more interesting church is that of Selworthy, about two miles distant. Very pleasant it is to step from the blazing sunshine into the cool and spacious interior, to examine the ribbed roofs with their hundreds of carved and coloured bosses, representing the wheel of St. Catharine, the Lamb, the Dove, and a long series of saints, apostles, and angels; and, perhaps, amid the hum of a thousand flies dancing in the tracery of a sunlit window, to attempt a sketch of the delightful oak cornice of the south aisle (see sketch), where the flowing foliage of Perpendicular times is already taking upon itself the airs of the Renaissance. Over the south porch is a chamber. Surely it was a parvise once, devoted to the use and comfort of the parish priest, but when the priest had departed, the Protestant lord of the manor stepped in, and, breaking out an opening into the church, converted the room into a manor-pew, where his Worship could worship at his Worship's ease, and look down, actually as well as metaphorically, on the common people below. Now, however, the lord of the manor has relinquished his lofty seat, and the little chamber is used as a vestry. On the walls of the church are many monuments, several of the most remarkable dating from the time when long epitaphs were in fashion. The parson of the time, William Fleete, who died in 1617, seems to have had a gift in the making of epitaphs. He wrote his own "in swanlike sort," and not improbably wrote that to Philip Stennings, who died in 1589. At any rate, they are both composed in the pedantic spirit of that contemporary of their author—Holofernes in "Love's Labours Lost." They are couched in Latin verse and in English verses translating the Latin. They are too long to be given here, but in the first two lines of one of them we catch a note that would harmonise with the music of Shakespeare's sonnets:—

If inward givies of minde thou doe respecte,  
If he innobled be that so is dect,

then must Philip Stennings be a nobleman, and so forth. If the sermons of this reverend poet were as long in proportion as his epitaphs, he must verily have stood in need of the usual hour-glass, both to remind him of the limit of human endurance, and of the fact that one hour less intervened between him and another opportunity of recording the virtues of the aged among his hearers. The stand that probably contained the hour-glass of the time still remains (see sketch), and is fixed to the pulpit.

The work about the church generally is good, and outside unusual attention has been bestowed upon the label terminations (see sketch), which, by this slight exercise of ingenuity, are removed from the commonplace. By a minute attention to small details such as this almost any building, no matter how plain, can be transported from the dreary wastes of "building" to the sacred enclosure of "Architecture." There is here, as in most of the villages in the neighbourhood, a churchyard cross (see sketch). A few steps below the church lies the green, round which are scattered a few picturesque cottages, with rustic porches and creeper-covered walls, within which various old retainers of the owner of the soil pass the remaining years of their lives in peace and comfort. From the churchyard itself a wide view is obtained across the valley on to the great brown sides of Dunkery Beacon, at the foot of which lies Luckham; while to the left, in another valley, is Wotton Courtenay. The church at Luckham (or, more picturesquely, Luccombe), rivals Selworthy in its lofty proportions, but it has not so many interesting features, a pannelled altar-tomb, removed to the tower, being the chief. The base of the churchyard cross still remains, but the cross itself is gone.

Wotton Courtenay has been more fortunate in this respect, and it retains a cross with a base of unusual elaboration (see sketch). Inside the church there are, again, some carved bosses to the roof, whereon appear a

winged bull, a winged lion, a cockatrice, a pelican in her piety, and other symbols. Incorporated with the nave piers are some good Perpendicular niches, but the saints that once stood within them have disappeared. A pannelled font, a holy-water stoup in the south porch, and one or two other features, serve to raise Wotton Courtenay above the ordinary level of village churches, and render it better worth a visit than, for instance, the adjacent church of Timberscombe, where, however, there is a very good rood-screen. Beyond the churches in these villages, there is but little building with any architectural interest. Many of the cottages have moulded windows and door-frames, mostly of wood, but when you have drawn the section of the moulding you have exhausted the interest they offer. But for a holiday, where a good walk over the breezy hills is rendered all the pleasanter for having a church as its bourn, few villages are better adapted than those on the skirts of Exmoor.

#### NOTES.

WE gather from some papers sent to us for examination that the sewage of Forfar is satisfactorily disposed of on land at the rate of 500 or 600 persons per acre. The population is 15,000, and the area of land appropriated is 24 acres. The Medical Officer of Health of Forfar, Dr. Murray, read before the British Medical Association at Glasgow lately a sanitary history of the scheme of sewerage of the town, and approved of its working during the last ten years. The ground was laid out for the disposal of the sewage by Mr. J. Bailey Denton, C.E., in 1877. The effluent water is satisfactory, clear, and free from smell. Three families reside on the land, and in no instance has disease been traceable to the mode of sewage-disposal. The whole extent of the land belonging to the sanitary authority is 40 acres, but of this only 24 acres have yet been appropriated. If we remember rightly, Mr. Bailey Denton urged the Forfar sanitary authority a few years ago to extend the application of the sewage to the whole of the 40 acres, in which case there would be 300 or 400 persons per acre; but as the sanitary conditions and the financial conditions of the present state of things are both satisfactory, the Town Commissioners do not appear to have yet thought it necessary to do so. The income from the "farm," for the year ending last May, was 432*l.*, and the expenditure 350*l.*, leaving a surplus of 82*l.* Seventeen acres are laid out for broad irrigation, and seven are formed into level ridges and furrows, the ridges being planted and the sewage admitted to the furrows intermittently, the plants taking up what they need, and the greater part of the sewage filtering through the ground; the effluent water passing off by drains laid for the purpose. By this intermittency of application, and consequent aeration, the oxidation of the putrescible organic matter of the sewage is effected. The irrigated part of the land is on the catchwater system, the gutters following the contour of the land. When one of them is filled, the sewage overflows its edge and runs down towards the next one, which is again filled to overflowing. The filtration area is laid out in a series of level terraces of ridges and furrows. Frost never interferes with the absorption of the sewage on this area. Dr. A. P. Aitken, of Edinburgh, made an analysis in July last of the sewage as it came from the town and after it had passed through the land, which showed that the solid matter in solution was reduced from 37.5 to 36.5; the chlorine was reduced from 5.2 to 3.7; the free ammonia from 69 to 0.12; the albuminoid ammonia from 2.5 to 0.78; the organic suspended matter from 21 to none, and the inorganic suspended matter from 23.5 to none.

LAST year we gave some description of the neighbourhood of Overstrand, near Cromer, as an ideal seaside place for those who like a fine beach and sea, without a



crowd of lodging-houses and a "promenade." In another column we note a sale of building lots on the "Overstrand Estate," which probably signalises the close of this primitive fishing-village stage of Overstrand, and its entry in no long time into the "fashionable watering-place" category. The demand for residences here, at all events during the seaside season, is almost certain to increase; and to many, no doubt, the change will seem an "improvement." The few houses already built, it must be said, are in a picturesque style, which it is to be hoped will be continued throughout; and the building-lots have been laid out so as to leave a good deal of space between the houses, partly to be appropriated to lawn-tennis ground. The main terraces also are laid out, as they should be, at right-angles to the sea, so as to give the sea-breeze free access up the roads. We observe, however, that nothing was said in the recommendations appended to the auctioneer's announcement, as to either water-supply or drainage. Water-supply at present is from local wells—a somewhat doubtful source in a district where, in all the old houses, the privy and cess-pool system is in full force. What is the scheme proposed for the drainage of the new property we are not informed. What we do know is that close to the top of the gangway leading down the cliffside to the beach there is a large grid, out of which proceed odours of a very threatening description, and which has been adroitly placed at the very spot close to which every visitor must pass on the way to and from the beach. We presume this represents the "ventilation" of a cess-pool, which is the main receptacle of such drainage as there is. Those who are responsible for the laying out of the new building estate should see to this: cess-pool emanations on the cliff form a serious discount to sea-breezes and bathing on the beach.

**CROMER**, which was as crowded as usual at the commencement of the season, has been suffering from scarcity of water, owing, as we were informed, to a partial breakdown in the water-company's supply: a difficulty which has caused a partial exodus of its guests; not without reason, if many of them were reduced to drinking of the water of the well behind the life-boat-house, which it would require much filtering power to bring into a desirable state for home consumption. The popularity of Cromer itself at present it is not very easy to understand; the two or three old, narrow, twisting streets or lanes, without footwalks, which form the main part of the old town, are curious and picturesque; but the new extension of the town westward has resulted, for the present, in the creation of a desolate and dreary quarter, in which large, staring, new terraces of brick alternate with melancholy tracts of waste land, covered with rubbish. In time, probably, this transition stage will be passed through, and Cromer will come out as a kind of Norfolk-coast Brighton. There is one serious point, however, which ought to be considered in connexion with this work of transformation, namely, the rights and interests of the native fishing population. We regret to learn, from the independent testimony of several of the fishermen, that while their small houses are being ruthlessly condemned and pulled down to make way for new terraces of lodging-houses, no steps are being taken to build elsewhere any such cottages as these men and their families require, and can afford to rent. We were assured that in not a few cases the fishing families who had been turned out of their original homes had no resource at all but to club together, two or three families in a house; and that they view the progress of "improvement" with great anxiety. This is not as it should be. If not a legal, it is, at least, a moral duty incumbent on those who have the building operations at Cromer in their hands to see that the original inhabitants are not thrust aside and left practically homeless in the interests of the proprietors of new hotels and lodging-houses for the visitors.

**THE** most recent contribution to the mass of literature on the subject of Theseion at Athens is by Dr. W. Müller, in a pamphlet on the Metopes of the Theseion in relation to vase paintings representing the same subjects ("Die Theseus Metopen vom Theseion zu Athen in ihrem Verhältniss zur Vasenmalerei." Göttingen, 1888). The conclusions Dr. Müller comes to are briefly these. Out of one hundred and thirty vases, which represent the exploits of Theseus, the possible influence of the metopes can only be detected in thirteen. These vases can all be dated later than 430 B.C. The presumption is, therefore, that the metopes were not set up before that date. We do not attach much importance to an argument based on the relation between monumental sculpture and the art of vase-painting, but it may be observed that such evidence as there is seems to point to the same conclusion that Dr. Dörpfeld arrived at on independent architectural grounds, i.e., that the temple is no Theseion at all; that it was set up at a date midway between the building of the Parthenon and the temple at Sunium, and therefore had nothing whatever to do with Cimon's fetching of the bones of Theseus from Sciron.

**IN** the Mittheilungen of the German Archaeological Institute ("Römische Abtheilung," iii, 2, 1888), Dr. Wörters publishes a very interesting bust from the Herculanian Villa. This bust has been long well known, but, from a careless reading of the inscription, has been called Archimedes. From a facsimile of this inscription which Dr. Wörters gives, there can be no doubt that "Archidamos" must be read in place of Archimedes. The famous mathematician gives place to the not less famous Spartan king, Archidamos III. It is surprising that the bust could ever have been held to be Archimedes, for it is the portrait of a man in armour, with sword-belt over his shoulder. The type of face is just what would be expected of the rough and valiant Spartan, and, moreover, the hair accords strictly with the Spartan custom. Plutarch, describing a statue of Lysander, remarks that the hair and beard were long, both after the ancient fashion. Lysander is reported to have said that "long hair made the handsome more beautiful and the ugly more terrible." Dr. Wörters has devoted much time to the examination of Roman portrait busts, and he is doing excellent work; there must be countless instances of busts with wrong inscriptions, and busts with no inscriptions at all, which might be identified.

**ABOUT** seventy years ago three old houses stood by the western verge of Greenwich Park. Of these, Montague House had belonged to John, Duke of Montague, and passed to his kinsman, Henry, third Duke of Buccleuch, who, in 1767, married the Lady Elizabeth, daughter to George, Duke of Montague. In 1798 it was rented by the Princess of Wales (Queen Caroline), who was appointed Ranger of the Park in 1806, and lived here until 1810. Montague House was pulled down, by the Prince Regent's commands, in 1815. The adjoining mansion—latterly known as Brunswick House—was for a while occupied by the Princess's mother, Augusta, the Dowager Duchess of Brunswick, who, in 1807, bought the remainder of the lease from Major-General Richard, son of Sir Edward, Hulse, Bart. Brunswick House, as held from the Crown, had been leased in 1694 to one Nicholas Lock, merchant (*teste* Lysons), the land being described as a plot of ground on which were three houses lately built by Andrew Snape. In 1753, Philip, Earl of Chesterfield, purchased the assignment of part of this ground whereon stood the house—at that time belonging to Dr. Stephen Waller. Lord Chesterfield improved and enlarged the house, and for many years used it as a country seat. He styled it "La Petite Chartreuse," perhaps because East Greenwich manor, which once belonged to St. Peter's Abbey at Ghent, had, as an alien possession, been granted by Henry V. to the Carthusian monks at Sheen. His successor in title, Philip, fifth

Earl of Chesterfield, assigned it in 1782 to the above-named General Hulse, who, two years later, obtained an extension of the Crown lease for seventeen years, to run from 1816; but he died, in Spain, in 1812. Brunswick, or Chesterfield, House was taken for the Princess Sophia of Gloucester, King George III.'s niece, who was appointed Ranger in 1816, and lived here until his death on Nov. 29, 1844. Tradition places the first meeting between Frederick Prince of Wales and his bride, Augusta of Saxe-Gotha, on the balcony. This is the house, now known as the Rangers' Lodge, whereof her Majesty has just granted a life-interest to Lord Wolsley. The third house, hard by, where Chesterfield-walk meets Croom's-hill, formed the early home of another perhaps as famous if less distinguished Major-General—James Wolfe—the only child of one of Marlborough's staff, whose body was brought hither from Quebec, and buried in the parish church of St. Alphege on November 20, 1759. There, too, lies Lavinia Fenton, the favourite *Polly Peachum* of *Oliver*, who married Charles, third Duke of Bolton. After her husband's death (1756), she became affianced to Wolfe. We have read that it was she who gave to him a copy of Gray's "Elegy," the poem that was repeated on the early morning of the 13th of September, 1759, in the boat which conveyed Wolfe up the St. Lawrence to meet the Marquis de Montcalm's forces on the plains of Abraham. The Duchess of Bolton died on January 17th, 1760.

**THE** late Mr. William Elers's trustees have decided to sell by auction a freshhold property at Tunbridge Wells, facing the Common, and comprising the Pavilion Ephraim House, No. 83, Mount Ephraim, where is made the once-popular wooden ware—and a portion, reputedly, of the palace of King Charles II., whose consort often resorted hither. When Queen Henrietta Maria went to drink of the waters, which had first attracted Lord North's notice, *tempore* James I., when visiting Lord Abercromby at Eridge Castle, her suite, it is said, were obliged to encamp on the Common. No was it until thirty years later that sufficient accommodation was provided to supplant the tents and booths that used to be set up for visitors here. For the Wells is the zenith of their fame, we must revert to the middle of last century. The "Pantiles," now somewhat modernised, are delineated in a drawing dated August, 1748, and belonging to Richardson. The figures, named in his own writing, include those of Dr. Johnson, the Bishop of Salisbury (Dr. Gilbert), Lord Harcourt, and Colley Cibber—in a group, Miss Chudleigh (the Duchess of Kingston, walking between Mr. Pitt (Earl of Chatham), and Mr. Nash; Garrick with Mrs. Trasi (the singer); a party composed of Speaker Onslow, Lord Powis, the Duchess of Norfolk, and Miss Peggy Banks; with others.

**THE** Calderwood Estate, Lanarkshire, will be re-exposed for sale by "public roup" in Edinburgh on October 10th. Calderwood Castle, in East Kilbride parish, and near to Blantyre, has been for more than five hundred years past the seat of a branch of the Maxwells, who have given a name to Maxwellton, a village that lies quite within the estate. The castle stands by the Calder, which, rising in Elrig Muir, and augmented by the Rotten, flows into the Clyde, and is famous for its numerous falls and cascades; one of them being the Reeking Linn. Calderwood extends over 1,460 acres, of which nearly 1,180 are under cultivation. The rental for last year amounted to 2,598*l.*; the upset price is now fixed at 60,000*l.* The property may be purchased, if preferred, in three lots: the two farms of North and South Allerton, 230 acres; and Greenhills farm, 120 acres,—these two lots being parts of the

\* Whether by a midshipman, or Wolfe himself, we cannot ascertain. *Take* Lord St. Hope's "History." The late Dr. St. Stanley told us that Lord Lauderdale did say that a midshipman recited, or read, the poem at Wolfe's request.



cient Calderwood barony as held of the prince and Steward of Scotland; and the mansion house property, lying along the river, 110 acres; upset price 50,000.

It is evident that the new County Council for London will not lack advice from at least one member of the principal body which is to be superseded by it. We printed last week a letter from Mr. Mossop urging that more consideration should be shown to the requirements of the building trade by the new Council than has been shown by the Metropolitan Board of Works. Mr. Mossop (it should be said in justice to himself) a young member of the Board, and perhaps a little too energetic and businesslike for the majority of his colleagues at Spring-gardens; we cannot therefore be surprised that he did not carry the proposal he made with the view of making the Board's annual vacation a little more compatible with the needs of the metropolis in the matter of new and important building works of a special character. But, from another letter from Mr. Mossop which we publish this week, we gather that he has scored at least one success, though he complains that, his suggestion "being only a practical one, it was not noticed by the press."

WE have often pointed out how inadequately and incorrectly the proceedings of the Metropolitan Board of Works are reported by the daily papers, but there is a word to be said for the occupants of the Press gallery in the Spring-gardens Board-room. We said the gallery is not only "cabin'd, cribb'd, confin'd," to a degree which is inconvenient, and even painful, but the room is acoustically very bad. But the chief obstacle to careful and intelligent reporting of the proceedings of the Board lies in the shape in which the Board's agenda-paper is presented to the reporters (as well as to the members). First of all, there is the paper of business; then there is always a "supplemental paper," and very frequently a "further supplemental paper," while sometimes there is an "extra further supplemental paper." These supplemental papers would not be much to complain of in themselves if the matter contained on them were arranged throughout in consecutive order, and in the order in which the business would be taken, though even then the three or four portions which go to make up what is, after all, but one document, would be more convenient if merged, and made actually, as well as nominally, one. But, as a matter of fact, the recommendations of each committee are spread by instalments very often over the whole series of papers, so that one has to go from one paper to another continually in order to follow the course of business. Each item is numbered or lettered, but many of them are so rapidly called over and voted upon that even some of the members of the Board get perplexed, and demand from the Chairman the page of the paper he is "on." What with the multiplicity of committees and the multiplicity of "papers" there is a constant turning to and fro of the leaves, both by members of the Board and by the reporters. To say nothing of the constant rustling noise caused by this operation, nor of the conversational buzz of inquiry which the higgledy-piggledy "arrangement" of the paper induces (neither of them insignificant incidents in a place already acoustically bad), it should be pointed out that while the reporter is trying to find an item on the paper, the Chairman, with his rapidly-spoken "That No. 13 be approved? Carried? Carried! No. 14? Carried? Carried!" &c., has got far ahead. It has always puzzled us to know why the Board's agenda-paper is presented to the members and to the Press in a state which is little better than printers' "pi." It would only be paralleled if a newspaper were to be published as a mere mass of printers' "galley-proof-slips," disconnected and unassorted,—a bit of one here and a bit of another there, instead of in a form in which the various articles and reports have been arranged and brought

together in due order. How it is that such a state of things has been tolerated at Spring-gardens so long, with one or two practical printers and one or two newspaper proprietors on the Board, is a mystery. It is doubtless necessary that members of the Board should have the earliest possible intimation of the business that is coming forward. This could be done as hitherto, by the fragmentary papers we have mentioned; but there is no reason on earth why, on Thursday afternoon or evening (the Board does not meet till noon on Friday) the various items on these fragmentary papers should not be edited or re-arranged and printed in consecutive order, for the use of the members of the Board and of the Press at the Board meeting. This simple and easily-practicable reform could be carried out for a trifling increase in the printers' bill, and would greatly facilitate the conduct of the Board's business and its better comprehension by those who have to chronicle its proceedings. The School Board for London,—a much younger body,—not only presents its paper of business in consecutive order, but prints and issues with it the full text of the reports of the various committees,—a thing which the Metropolitan Board of Works never does. Here, then, is another point in which the County Council for London may improve upon the practice of its predecessor.

#### LETTER FROM PARIS.

THE strike of navies, which at one time threatened to attract also the masons and workmen of other trades, has subsided without any appreciable results in favour of the strikers, and without any tragedies, thanks to the good sense of the bulk of the men themselves in resisting the appeals of the anarchist orators. The contractors not having yielded to threats, and the police having closed the "Bourse du Travail," which in fact was merely a political club,—the workshops are open again, and the works recommenced everywhere, and—

"Le combat finit faute de combattants."

In fact, the strike, menacing as it was in spirit, had only a feeble and temporary effect on the large public works, and those for the Exhibition did not even suffer any interruption. There was a cessation of work at one time on the new crossings for the Chemin-de-Fer de Ceinture; but the work is all going on again now, and on the east of the city a large iron bridge, 130 metres long, has just been opened across the Cours de Vincennes—a great relief to that crowded road; and the viaduct carrying the Rue Caulaincourt over the cemetery of Montmartre is nearly finished. Further on, the church of the Sacre Cœur shows its profile on the summit of the hill; and elsewhere the workmen are engaged in opening out, in the Faubourg St. Antoine, the Avenue Ledru Rollin, which will join the Avenue Daumesnil; and in the centre of the city the administration has caused to be formed, under the Halles Centrales, an immense mill, so to speak, for the supply of electricity, for which the Municipal Council has voted 1,100,000 fr.

At the Champ de Mars the framework of all the pavilions is so far advanced as to promise their completion by the 15th of September, and the Eiffel Tower continues to ascend steadily, and looks, on the whole, more satisfactory in effect than was expected; at all events, we can see, now that a great deal of the plant and scaffolding is removed from the lower portion, that the arches on which it stands will not interfere at all with the general view of the other buildings of the Exhibition. In the Galerie des Machines eighteen of the 115-metre girders are fixed, and the buildings for the "Industries Diverses" will be soon covered in. On the Esplanade des Invalides several structures are now erected, especially the large conservatory intended for the plants of the Colonies and of Indo-China.

In regard to the decorative side of the Exhibition, the last piece of news is that M. Olivier Merson has been commissioned, along with M. Paul Sédille, to design the decorations for the monumental gate which will give access to the section of "Manufactures Nationales" on the Champ de Mars. This gate will be adorned with two figures in mosaic, symbolising the Arts of Tapestry and of Mosaic. The Government is already occupied about the subject of the awards and medals to be given at the close

of the Exhibition, and has appointed a jury to decide on the merit of the designs for the diploma, for which a premium of 10,000 fr. has been offered. This jury includes Mm. Chaplain and Guillaume (sculptors), M. Roty, the eminent medallist, M. Charles Garnier, M. Daumet, and M. Sédille (architects), and M. Elie Delaunay and M. Galland (painters).

Although there is nothing of the artistic about it, we may mention, as a curiosity, an enormous terrestrial globe which has been made in view of the Exhibition. It is 40 metres in diameter, and will be supported on a metal base 5 metres high. This globe, of which the meridians and parallels will be executed in iron, will turn on its centre once in the twenty-four hours, and will represent the earth to scale. It will thus show, in their true comparative dimensions, many spaces which on ordinary globes figure as mere points; thus Paris, on this globe, will be more than 2 millimètres in diameter.

A new establishment for secondary education is to be inaugurated by the Government after the recess, that is to say, in October. This Lycée, specially intended for girls, and called (we know not why) the Lycée Molière, is planned and designed by M. Vaudremer. It is a large building, situated at Auteuil; of very simple architectural treatment, but of which the interior arrangements have been very carefully studied for their purpose. The principal façade is situated in the Rue du Ranelagh; the buildings are in stone, with bands of coloured bricks. The courtyards are made gay with pots of flowers and shadowed with trees, and the percoloes which surround them are covered with climbing plants. Thus the buildings have not that stern and forbidding aspect which characterises too many of the Parisian educational establishments, which have but too close a resemblance to prisons.

After being closed for some days, to allow opportunity for the arrangement of some new purchases by the State, the Luxembourg Museum is about to re-open its doors. The scaffoldings, which have for two years covered the façade, have at last been removed, and one can form a definite idea of the decorative effect of M. Crank's pediment. Three figures, in a fine style and with grand draperies, compose a bas-relief in which "La Gloire" is represented distributing crowns to two reclining figures symbolising "Painting and Sculpture."

Since our last letter the Académie des Beaux Arts has given its judgment in the competition for the Grand Prix de Rome (Painting, Sculpture, and Architecture). In Sculpture the prize (the subject being "Orestes at the tomb of Agamemnon") has been awarded to M. Louis Joseph Convers, pupil of MM. Cavellier and Aimé Millet; the second "grand prix" has gone to M. Henri Theunissen, pupil of M. Cavellier; and a subsidiary prize to M. Hippolyte Lefebvre, pupil of the same master.

In Engraving, the competitors have had to engrave a figure drawn from life. The first "grand prix" has been awarded to M. Henri Leriche, pupil of MM. Henriquel, Levasseur, and Bouguereau. The first of the second prizes has been awarded to M. Eugène Marie Chiquet, pupil of M. M. Henriquel and Cabanel, and the additional one to M. Jules Deturck, pupil of MM. Henriquel, Levasseur, and Cabanel.

In Architecture, the subject was "a Palace for Parliament," and the jury have awarded the first "grand prix" to M. Joseph Tournais, pupil of M. André. The design which has gained the prize for this young architect is well worthy of the occasion, being very well studied in plan, and presenting a fine outline and grouping on each elevation. The design shows an amount of talent which promises well for M. Tournais's future in the profession. The second prizes have been awarded to M. Louis Henri Sortais, pupil of MM. Daumet and Girard, and to M. Eugène Jean François Hugnet, pupil of M. Blondel.

One remark we may take the opportunity of making in regard to these competitions for the Prix de Rome. Except in the architectural section, where the subjects generally have some modern application, the Institut goes every year to Greek and Roman sources for the subjects for competition, and the unfortunate competitors have, year by year, to study how to represent, with brush or modelling-tools, "Orestes" or "The Alarm of Nausicaa," or other not less mythological subjects; the results are certainly not happy, and a reform is very necessary in this respect: for it certainly cannot be denied that French national history includes a sufficiency of subjects worthy of



treatment by painters and sculptors. Is not the "Mimbeau" of M. Dalou a sufficient example of this? We should certainly be more likely to develop in our young artists a true and healthy inspiration by giving them subjects including the real history of real persons and events, besides also giving occasion for archaeological study in regard to the furniture, dress, and architecture of the periods from which the subjects were chosen. This is a matter which our "Immortels" at the Institut persist in ignoring, and that is why official art, that of the "Bout du Pont," as we say in Paris, will remain continually a drag and impediment on the development of true artistic originality and individuality, which are smothered under school formulae.

The Leclaire prize, we may here mention, has been awarded by the Académie des Beaux Arts to M. Joannon, architect, pupil of M. Blondel, and to M. Sortais, pupil (as above mentioned) of MM. Daumet and Giraud.

On August 12 the monument to the brothers Galignani was inaugurated in the little town of Corbeil, near Paris. This monument, of which something was said in our article on the Salon, is the work of M. Chapu, and has been erected by public subscription. It recalls the recollection of the two generous foreigners to whom Corbeil owes its numerous charitable foundations, and who are always spoken of in the neighbourhood with a kind of religious respect.

We may mention also the monument which is to be erected at Montrouge to the memory of the naval captain, de Lamalgne, who committed suicide, in 1871, rather than deliver up the fort of Montrouge to the German army—a method of exhibiting patriotism which would hardly, perhaps, be appreciated among Englishmen. There is a statue of Balzac, also, which the "Société des gens de Lettres" is about to erect at Tours,—a legitimate homage to the memory of an illustrious writer. Many artists of celebrity have wished to execute the monument, but the committee have decided to entrust it to the chisel of M. Dalou, who will, no doubt, produce a work worthy both of Balzac's fame and his own. There is talk also of the erection of a statue to Leverrier, the astronomer, in the garden of the Paris Observatory.

Although it is not strictly a Parisian matter, we cannot pass over without mention the monument proposed to be erected at Bordeaux to the memory of the Girondins who were victims of the French Revolution. As the result of a competition which has just been decided, the execution of the monument has been entrusted to M. Labatut, as sculptor, and M. Esquié, as architect. The work will cost 200,000 francs.

M. Georges Lafenestre has been appointed conservator of the Musée du Louvre, in place of the lamented M. de Tausiac.

We have to mention the decease of a sculptor of talent, M. Pierre Bernard Prouha, who was a pupil of Ramey, Toussaint, and Dumont. Among his numerous works may be mentioned the decoration of the façades of the cathedral of Alby, the caryatides of the Monte Carlo Theatre, those of the Eden Theatre, besides a crowd of smaller works in bronze and terracotta, which should have sufficed to make not only a reputation but a fortune. In spite of constant work, however, Prouha, whose life was one long and bitter fight with circumstances, died at the age of sixty-six in poverty.

#### THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT GLASGOW.

It is a sign of the growth of public interest in the antiquities of Scotland that an invitation should have been addressed to the British Archaeological Association to hold a Congress at Glasgow. The proposal, we understand, originated with the Glasgow Archaeological Society, itself already one of the most vigorous of the now numerous local societies established during recent years. The invitation having been coupled with the offer of abundant support, and the municipal authorities having warmly seconded the proposal, the Association was not tardy in accepting it, and for the first time in its history, the annual Congress of the Association is now taking place on Scottish soil. The year has been well chosen, for there are not only the many numerous objects of interest around the city, but there is there now the special and remarkable feature—the Glasgow Exhibition.

Already many thousands of sight-seers have been attracted by it, and it is only reasonable to suppose that the collection of Scottish antiquities in the model of the ancient palace of the bishops and archbishops of Glasgow should attract attention of a more special character.

The aspect of some parts of Glasgow is remarkably different from that of London or of any of the other large towns of England. Without possessing any special features of architectural style or elegance, the appearance of the tall old Paris-like houses of the east end of Glasgow is singularly suggestive of some foreign influence, and the aspect of many women and children of these parts, without either shoes or stockings, helps to make the picture still more unlike what appears south of the Border. Glasgow has singularly followed the sun in the positions of its new buildings, the old part of the city being now quite to the east of the new. Here is the ancient steeple of the Tolbooth, with its weird carillon somewhat out of tune. Almost opposite to it is the quaint tower and spire of the Tron Church, built over the roadway, a curious late imitation of that of the cathedral. The Tontine House and the bronze statue of William III. still help to give Glasgow its old-world look, but the better-to-do inhabitants have departed. The College has also migrated to the West End; its old buildings are demolished, and their site is now occupied by goods stations and all the other features of modern traffic. The Cathedral, shorn of all its surroundings of contemporary date, is a link of connexion between west and east, and the congregations, numerically large, which gather within its walls, still testify to the regard shown to the Mother Church by the present residents and visitors.

The proceedings of the Congress were inaugurated on Monday morning, at eleven o'clock, when the members were publicly received in the Council Chamber by the Lord Provost of Glasgow (Sir James King) and the local executive committee. The weather was fine, and the Council Chamber was filled with ladies and gentlemen.

Judging by the good attendance and the amount of interest shown, it is evident that the Congress will be one of importance. As we have already mentioned, her Majesty the Queen and also the Prince of Wales (as Duke of Rothesay, Earl of Carrick, and Baron Renfrew) are patrons of the meeting. The Marquis of Bute is President, and among the list of the vice-presidents are the Dukes of Abercorn, Argyll, and Montrose, the Marquis of Ailsa, the Earls of Home and Stair, Lord Hamilton of Dalziel, and many others well known in Glasgow society.

The Lord Provost gave the Association a hearty welcome to Glasgow, and spoke of the comparative absence of ancient buildings from the modern city, but this was well compensated for by their existence in the immediate locality. Sheriff Berry, Chairman of the Local Executive Committee, also rendered a hearty welcome to the members, as did also Mr. John Honeyman, F.R.I.B.A., President of the Glasgow Archaeological Society.

Mr. Thomas Morgan, F.S.A., Treasurer of the Association, having replied to these expressions of courtesy, the party proceeded by carriage to the site of the battle of Langside. Here, on the 13th of May, 1568, was fought the celebrated, and in many respects memorable, battle which decided the fortunes of Mary Queen of Scots. Proceeding to the flagstaff mound now in the centre of Queen's Park, the party assembled around Mr. A. M. Scott, who narrated the story of the battle from the time of the escape of the unfortunate Queen from Lochleven Castle on the 2nd of May to the day of the defeat on the ground before them. The mound commands an extended panorama of Glasgow in the distance, and of many a mile of adjacent country. From this standpoint Mr. Scott pointed out the course of the Queen's route from Hamilton along the road to Paisley on the south side of the river, and where her army halted on finding the passage of the road disputed by the forces of the Regent Murray. Various other spots where incidents of the encounter took place were also in sight, including the position of the Queen and her immediate guard. The battle was decided in the short space of three-quarters of an hour. The scenery was lit up by a flood of sunshine, after rather a severe storm, and the various spots referred to in Mr. Scott's animated address, were regarded with much interest by his audience.

Queen's Park contains a goodly portion of the site of the battle within its ample area. The inhabitants of Glasgow may be congratulated in having so admirable an area of land rescued as an open space for ever from the encroachments of modern building, which is beginning to change the aspect of the scene. The park fortunately contains also a curious pre-historic earthwork on Camp Hill, which was also inspected by the party. It is of circular form, the enclosure being an earthen rampart of moderate height, the spot commanding a prospect of considerable extent and great beauty. Some burnt wheat was found here in an excavation made to a depth of 10 ft. or 12 ft., but no other objects appears to have been found. Mr. Scott pointed out that the camp was one of several in the locality, and their use afterwards by the Romans was more than probable in relation to the termination of the Antonine Wall not far off on the opposite bank of the Clyde, close to Dumbarton.

The party then proceeded to the village of Langside, in the vicinity, to witness a ceremony which will always be remembered in relation to the present Congress. This was for its members to take part in the formal handing over to its custodians of the memorial of the battle, which is now completed. The monument consists of a tall circular column, covered with the Scottish thistle arranged in spiral form as a diaper around the shaft. The capital is foliated, and above it is a boldly-carved Scottish lion. The base is a solid square, arranged in masonry blocks having well-designed eagles at the four extremities. The work, which is in the Grecian style, very freely treated, is artistic and good, and has been designed by Mr. Skirving, architect. The ceremony was an interesting one, witnessed by many hundreds of people, the site being gaily decorated with flags and Venetian masts. The Lord Provost took the chair, on the motion of Mr. Shaw Stewart, M.P., after which Mr. Wylie Guild handed over the custody of the monument to the Trustees of Hutchinson's Hospital. Light refreshment in the basement hall of the new church at Langside, opposite the monument, having been partaken of.

The party next proceeded to the Cathedral of Glasgow, where Mr. John Honeyman read an elaborate paper descriptive of the building, and indicated the dates of its various portions. He traced the progress of the works of the present fabric from early beginnings, and stated his belief that a small church founded by St. Kentigern occupied the site at remote times. Of the cathedral erected by Bishop John no fragments remain, but of that built in its place by Bishop Jocelyn he indicated a portion in the crypt, incorporated in the work of the next century. This opinion is contrary to the popular belief that the present crypt is the work of the bishop named. The choir dates from the middle of the thirteenth century, as does the remarkable crypt below it. The nave was erected about forty or fifty years later, although the lower parts of the walls, north and south, are somewhat earlier. The Chapter-house dates from between 1425 and 1435. It is of two stories, quadrangular in form, the lower one being the Chapter-house, the upper floor the sacristy. The crypt, Blackader's aisle, is a curious extension of that beneath the choir, of very late date, and a beautiful example of Scottish vaulting. Mr. Honeyman's paper was illustrated by a series of large detail drawings of the mouldings and other parts, showing certain points of resemblance to English work and many of divergence in that of later date.

After the Rev. Dr. Burns had thanked Mr. Honeyman for his address, he called upon Mr. Loftus Brock, F.S.A., to speak on the condition of the fabric. Mr. Brock pointed out some serious cracks, particularly two, right and left of the eastern tower arch, which go upwards through the spandrels and certain new work, and with a tendency to meet one another above the arch. The tower bears the highest ancient spire in Scotland, and these settlements require attention. Mr. Brock concluded by stating that what had been called the Lady Chapel was, indeed, the retro-choir. There is, instead of a central space for an altar, a line of piers and connecting arch. Mr. Honeyman next conducted the party around the church and into the crypt, which was lighted up. It was seen to very great advantage, owing to some parts being in full light, backed up by the deep gloom of the farther parts.

The party then proceeded to partake of afternoon tea, and this entertainment being given below the remarkable panorama of the Battle of



lannockburn, the painting was inspected as a prelude to the intended visit to the site of the battle later in the week.

In the evening a public dinner took place in the large hall of the Grand Hotel, the chair being occupied by Mr. R. Berry, Sheriff of Anarkshire.

On Tuesday the party proceeded by train and by carriages to inspect the ruins of Bothwell Castle, the property of the Earl of Home. The remains stand on a fine position on high ground above the Clyde, which winds along at their base, the steep banks being covered with foliage and underwood. On assembling in the courtyard, Mr. Dalrymple Duncan, F.S.A. Scot., one of the hon. local secretaries, read a paper descriptive of the history of the building. The founder, he said, was probably one of the family of Oliphant, one of whom, who was Justiciar of Lothian, died in 1242, when the barony passed to the family of Moray by marriage, and it belonged to Sir W. Moray, who died in 1300 while a prisoner in England. It was held for a time for the English, and at the extreme end of the thirteenth century it submitted to the Scotch after being besieged for thirteen months, the surrender being only occasioned by want of provisions. Edward I. in 1301 invested the Castle with an overwhelming force, and it had to surrender, after which it was held for the English, alternately by Aylmer de Valence and by Walter de Fitz-Gilbert. After the total defeat of the English on the field of Bannockburn, the walls afforded a refuge to the Earl of Hereford and a small detachment, but the Castle surrendered soon afterwards to Sir Edward Bruce. Once again, after the Battle of Halidon Hill in 1333, the English became the possessors, and Edward III. stayed here for about four weeks in 1335. The Earl of Moray retook the Castle in 1337, when it was dismantled, since which time it has remained in Scottish hands. The Earl of Douglas (Sir Archibald the Grim) married Johanna of Moray in 1362, since which time the property has passed by descent to the present owner. Mr. Duncan referred, during the reading of his paper, to many interesting points in the eventful history of the building.

Mr. Loftus Brock described the architectural features of the Castle, which he said was one of the oldest and one of the most important in Scotland. The masonry is remarkably well cut and evenly jointed, showing that, although there are but few earlier fabrics, yet at the period of its erection the craftsmen were well skilled, as if by practice elsewhere. All the towers project beyond the line of the curtain walls, thereby affording greater surface for attack, while the walls have the benefit of support, in a military sense, from the towers. The plan of the Castle, as it stood until a few weeks ago, consisted of a parallelogram, whose axis was east and west, the west end being occupied by an enormous tower, circular outside, octagonal within, the western portions having been long since demolished, and the breach built up across the portion of the circular face thus cut off. The north wall is obviously more modern than the older portions, which are of a date early in the thirteenth century, the donjon tower singularly resembling that of Pembroke Castle in outward appearance. There has been a beautiful chapel with a groined roof at the eastern extremity of the courtyard, and near to it a capacious banquetting hall, both being on the first-floor level, the latter portions of the building being most probably the work of Douglas the Grim. Within the last few weeks considerable light has been thrown upon the early form of the Castle by extensive excavations made by order of the Earl of Home. The effect of these has been to show that the building formerly was of double its present extent, and that it was of pentagonal form, the sides being irregular in length. The position of the original entrance has been found, together with portions of a paved causeway leading up to it. This entrance was by a narrow passage flanked by two circular towers. Traces of a sally-port have also been uncovered, and beside one of the walls the skeleton of a man of great height was found buried, the feet being to the east and the head to the west. The walls laid bare by the excavations are of beautiful masonry, regularly coursed and very truly cut, as perfect, as far as they remain, as when erected in the thirteenth century.

Mr. W. J. Easton led the party around the excavations and described them. Many stone balls have been found, and the evidences of the destructive forces at work were but too apparent in the ruined condition of the massive walls

laid bare, although their state shows that all the fallen upper part has been removed by hand.

The party next proceeded to the Parish Church, where Mr. Brock described the features of the remarkable stone-vaulted chancel, which, with its small vestry of similar workmanship, appears to have formed the whole of the Collegiate Church founded by the Grim Earl about 1398. The vault is pointed and continuous, with ribs of stone laid on, roofed outside with curved ridge and furrow, also of stone. There is much of what has been called French influence in the ornamentation, the arches of the doorways being either Burgundian in form, or semicircular. The existence of a sculptured slab within the church points to an earlier fabric on the spot.

After luncheon, carriages were taken to Hamilton, and the party then proceeded by train from Hamilton to the station called Tullie-tudlem, after the name invented by Sir Walter Scott, under which he has so graphically described the Castle of Craignethan, close at hand. Coal-pits and other signs of the altering features of the landscape are visible from the station; but there is nothing whatever visible of the Castle, although it occupies a lofty position at the edge of a steep bank far above the level of the Water of Nethan. The Castle consists of a square donjon keep, of a form common in Scotland, although its internal arrangements have the peculiarity of a divisional wall. It is of late date. There are imitation corbelling around the summit, for ornament and not for defence, and there is a small corbelled bartizan at each angle. Attached to the keep is a still later erection, consisting of a walled courtyard with square towers at the angles, and an entrance, the walls being pierced with openings for musketry or small cannon at a low level. A still later house, partially inhabited, built on the walls, is dated 1665. The scene is one of remarkable beauty, the foliage being tangled and of most varied form, while the rocky banks of the streamlet help to impart a charm to the lovely spot that must be seen to be appreciated.

Descending the valley, and afterwards having a glimpse all too brief of the Falls of the Clyde (Stonehyres Falls), the party arrived at Lanark only in time to catch the train back to Glasgow.

At the evening meeting, which was held in the Merchants' Hall, the Marquis of Bute presided, and delivered the inaugural address. After thanking the Association for electing him President, and bidding the members welcome to Scotland, he said they were conscious of the benefit to themselves in the study and illustration of the monuments of their history which the visit of such a body as that was calculated to confer. He had spoken of the monuments of history, for he thought it was now conceded that the true worth and true use and true work of archaeology was to be the helpmeet of the documents of history. It was in the general connexion with this fact that he hoped he might be allowed to frame the words in which he proposed to address them. Under the peculiar circumstances of the Association meeting for the first time in Scotland, he thought he might do best to permit himself a greater latitude, or perhaps he should say discursiveness, than he should have taken had he been addressing them in England. At the same time he should be careful to take as examples the things which they had seen or were to see, and to mention as many of them as he could. To his eye the history of Scotland always appeared to fall into three periods—the early, the mediæval, and the modern. The first, or early, period ended with the death of Macbeth, August 15, 1057; the second, or mediæval, lasted till the defeat of Mary at Langside (of which battle they visited the site on the previous day, and saw unveiled the memorial) on May 13, 1568; and the third, or modern, period stretched from the battle of Langside until the present day. He would take the last, or modern, period first, because in itself it was of least interest to an archaeological body, as such, since it had left hardly any material monuments; indeed, he might almost dismiss it in a sentence from that point of view, were it not for some features which were necessarily associated with it, and along with which he would rather take at once the places to which they were attached than recur to the same spots again and again from different standpoints. Had the modern period to be studied, then, from the point of pure history, little could have been more interesting. It was an illustrative fact that they would

only be brought in contact with some three or four buildings of that period, and only one of these of a State character. That one was the Chapel Royal of Stirling, built by James VI. for the baptism of his eldest son, Henry, and even this was built before the Union of the Crowns, and its present condition, which they would see, was an interesting instance of the results of the subsequent changes. The other buildings, viz., the Argyll lodging at Stirling, now a hospital; Newark House at Port-Glasgow, now included in a timber-yard; and Torwoodhead Castle, now a roofless ruin, were private dwellings, and as such were even in their best days the evidences, not of public prosperity, but of individual opulence. If, however, this period had left almost no monuments in the shape of edifices, it had left plenty in the shape of destruction. Among these some of the most, perhaps the most, typical were the buildings of a public or State character. They were to visit four which had been royal residences, viz., Stirling, Rothesay, Linlithgow, and Dunfermline. They had in common that they were all more or less monuments of the brilliant epoch of the five first Jameses. He would take Rothesay first as the least important. It was a thirteenth-century castle, with an addition of the time of James IV. The arms over the gate were among the earliest instances, if not indeed the first instance, of the employment of the two unicorns as the royal supporters. The present drawbridge was a most careful restoration from the existing piles found in the moat, and from parallel cases, made for him by the late Mr. William Burges. Rothesay Castle was burned in Argyll's rebellion in 1685, and had been a ruin ever since. The three other palaces they would see had suffered during the later period. That of Dunfermline, a combined palace and abbey like the Escorial, he need hardly speak of, because its associations, both religious and historical, from the days of Malcolm and Margaret downwards, were so important and vast that he could not touch them in a single paragraph. The palace was last occupied by a king, by Charles II., at the beginning of August, 1650. He left it on the 16th, the same day on which he signed the Dunfermline Declaration. Another very striking instance of the results of the Union would be seen in the magnificent palace of Linlithgow, burnt by the English troops after their defeat at Falkirk on 17th January, 1746, and which had remained unrestored. One more mark of the change was the present condition of the castellated palace of Stirling. They would see for themselves the state of that building—its abandoned gardens, its distimbered and neglected parks, its pleasaunce and tilting-yard turned into a cemetery, a fate which was just impending for the historic hill-top which lay beneath its eastern wall. He might as well finish at once what he wished to say about Stirling. Their attention would be called to the great Dominican Church, in which, among other events, Mary and James VI. were anointed and crowned. This church was now slowly undergoing a process of restoration, which had as yet extended only to the chancel. It was obvious that in the Middle Ages it was partially rebuilt, the chancel being the only part accomplished. With regard to the present restoration there were one or two things to be said. He trusted it would be neither accompanied nor followed by any modern outrage upon the usages of the past, such as the stone pulpit with which St. Giles, Edinburgh, had been disfigured, but that the wooden pulpit would be placed on the south side, as the best position for hearing, as the Mediævals would have done, and as was done in similar buildings in France and Belgium. There were three points upon which he hoped they would be very careful with this restoration. First, if the side chapels reached down into the nave, they ought to be incorporated with it. In the second place, if the vault of the nave was to be interfered with at all, he trusted it would only be interfered with with great caution. Thirdly, no one could doubt that there was a chancel screen. Its top was almost certainly occupied by a gallery, as at Glasgow, where the Town Council seat was. Very likely it bore the royal throne. Its position was now occupied by a wall, as used to be the case in St. Giles, Edinburgh, where his lordship remembered the Queen's throne, and a curious wooden barbacan resembling that of Rheims. He greatly feared that in the sweeping restoration of St. Giles' not only might the royal throne have been displaced from its ancient



position, but the only remains of the mediæval screen might have gone. He implored the authorities of Stirling to be careful how they tampered with the wall across their channel. As he was speaking of ruins, and had come to speak of churches, he might as well speak at once of the ecclesiastical ruins which they were to visit. This was worth doing, if it were only to protest against the vulgar delusion that all phenomena of this sort were to be ascribed to the Reformation. That was not so. He believed the sins of other people were very often credited to the Reformers. The only ruin of this kind which they would see was Cambskenneth, to which his lordship referred at some length. Its destruction, he need not point out, should be ascribed to the lay perpetrators rather than the actual Reformers. It was also said that the easternmost portion of the Abbey Church at Dunfermline was cast down by the Reformers in 1560. But it was difficult to tell what this expression "cast down" really meant. The church was certainly restored by order of the Lords of the Secret Council three years later, in 1563. The eastern part did not fall till 1672, and the destruction and deliberate pulling down of the last portion of the eastern half of the Abbey Church of Dunfermline was not at the epoch of the Reformation, but in November, 1819. The parish church of Rothsay owed its destruction to the beginning of the present century. The ruined chancel contained, *inter alia*, an empty tomb, which had been conjectured to be one of several erected by Robert II. for himself. The church was only abandoned in 1703, owing to the movement of population. The churchyard contained some curious pre-Reformation grave-stones of persons of the humbler class, in the shape of small stone crosses. Dunblane Cathedral, at least its nave, was roofless in the year 1238. It was roofless also in the time of Charles II., and roofless it remained. It was now on the point of being completely restored, and, as far as he was aware, the work was to be done in the most careful and conservative manner. The work owed its initiative to the sense and spirit of the heritors of the parish, but it was almost entirely executed by the pious munificence of Mrs. Wallace. Her name would, he trusted, be surrounded with the gratitude which it deserved. Turning next to Paisley Abbey, his lordship said it was erected in 1163 by Walter, the first High Steward of Scotland, as, he might say, an expression of the religious and cultured sentiments of the great house of Fitz-Alan, otherwise called Stuart, to which he belonged, and the descendants of which had now occupied the throne for more than five centuries down to our Sovereign. In one respect this building, or rather the site of part of the wall, presented the saddest feature which would meet their eyes in Scotland. The transepts, lantern, and chancel of the church must have been in ruins for some time when domestic buildings of the day were standing mostly still roofless. They were very remarkable, both historically and artistically. There were, he believed, only two specimens of domestic buildings remaining to our day in Scotland. If anything were to have been destroyed, the church could have been better spared, whereas Mediæval remains of a character not only domestic, but historic, were, at least in Scotland, almost non-existent. Within the last few years it had all gone, in order to straighten the street by 18 in. or 2 ft.—his lordship forgot which—and had given place to a plot of grass and an iron rail. The present aspect was like a human face after the nose had been cut off. An historical, and, in one sense, an artistic treasure, had been annihilated for ever. In any work of restoration, the first thing to be done was to erect a new square of buildings, church offices, or anything else they pleased, exactly upon the old foundations, harmonising with the church, and reproducing, as far as possible, the general idea of what had been lost. If he might be permitted, in addressing a severely scientific assembly, to draw a comparison from any scientific work of fiction, he might be permitted to compare the transition from the ruins of the third period of Scottish history to the obscure creative energies of the first, and the strong life of the second, to the transition of Faust when turning from the modern pathos of Margaret, and before throwing himself into the fairy old-world dream of Helen, he sought the mysterious place of the divine mother, the origin of things. It was in this earliest epoch that we found the first dim light shed upon the origin of Scottish history. He knew that this period possessed a

peculiar charm to many archeologists, especially to many who were students of anthropology. To them a kitchen midden or flint arrow-head was more attractive than the noblest work of Mediæval art. Of the very early works they had only included two as of special importance, viz, the historic hill at Langside, and the Tapoek Broch. Of the latter he would not speak, except to remark that it was one of three or four instances of this peculiar class of building found outside the extreme North. Fortunately the whole subject had received great attention from the learned, and perhaps none had treated it with wider information and intelligence, or in a more interesting and attractive manner, than Dr. Joseph Anderson, whose admirable Rhind Lectures were, he trusted, familiar to most of them. A more agreeable or trustworthy guide in early Scottish archeology it would be impossible to find. The mention of the name of this eminent man naturally suggested another peculiar class of ancient fortification of which he had treated—that was vitrified forts, or those in which the wall had been consolidated by being molten, and of which, although the examples were not uncommon in Scotland, there was not a single case in England, and few in Ireland or on the Continent. In afterwards speaking of the history and monuments of the Roman occupation of Britain, three of which were to be visited by the Association, his lordship referred to the opinion of Dr. Skene, and said it would be unseemly to leave the subject of the earliest period of Scottish history without offering some tribute of grateful homage to the present Historiographer-Royal for the manner in which that period had been elucidated by his labours. The second, or mediæval, period of the history of Scotland, as he ventured to term that which intervened between the reigns of Macbeth and Mary, was that which had left the greatest number of Mediæval monuments. With these alone could they be said as archeologists to be directly concerned. At the same time, it would be an altogether imperfect view of this period which would pass by its immense political and social importance. The monuments of this period, from the facts that we knew about the personal history of the people who lived in them, were instinct with the human interest which was necessarily wanting to those of the earlier period. This period still affected the popular patriotic sentiment more than any other. At the present day the two names which were popularly the most idolised in this country were those of two Mediævals,—namely, William Wallace and Robert Bruce. It was this period also which might be said to have founded the Scotland of the present by developing the social system, and giving birth to institutions such as the burghs, Parliamentary representation, jurisprudence, and the universities, which were subjects of special attachment and pride. This period was peculiarly ethnological. The Scottish people were then, as it were, in one sense alone. The nation was on the one hand unaffected by the consequences which had followed the union, first of the Crowns and then of the Parliaments, and on the other hand it was consolidated from the imperfect conditions of the earlier ages, and underwent no other very important territorial changes. Owing to the peculiar condition of Scotland during the Middle Ages, the noble Marquis continued, this period had left its monuments not only in nearly every institution, but in nearly all the historical and artistic buildings in the country. Perhaps no more striking instance of the unity and continuity of the national life could be met with than that which was placed before the mind, and to a great extent even the eye, in Glasgow Cathedral, which stood to-day as perfect in its architectural grace as it stood five or six hundred years ago. Wishart, or Zachary Boyd, or Dr. Burns officiated within it; and Edward the First, or Robert Bruce, or Cromwell worshipped within it; and Kentigern slept quietly through it in his narrow bed beneath the crypt; in one thing at least never made the victim of a change—that was, in the affectionate respect with which the citizens of the city which he founded had never ceased to bring to surround his memory and his grave—how diverse soever might have been the voices in which they had professed continually the aspiration of their motto that Glasgow might flourish by the preaching of the Word. He hoped that a brighter day was dawning for historical and artistic Scotland. The inborn energy of the century seemed somehow at last

to be struggling successfully even against the terrible legacy of the last century—that century which, whatever it might have been elsewhere, was to Scotland and to our development of Scottish national feeling, whether artistic or other, so truly a valley of the shadow of death—and a new spirit of culture to be arising, quickened by an increased vitality of national sentiment. As a help in such a direction, he hailed the meeting in Scotland of such bodies as the British Archeological Association. The interest in the learning, as well as the intelligent interest in mediæval monuments, shown by members of the Association were eminently calculated to enlighten the ignorant, to rouse the careless, to stimulate the thoughtful and the artistic, and to intensify the feeling of the patriotic.

Sir James King, Lord Provost, proposed a vote of thanks to Lord Bute for his address. Sheriff-Principal Berry seconded the motion, and the vote of thanks was warmly accorded.

Lord Bute having briefly replied, the proceedings terminated.

We will next week continue our report of the proceedings of the Congress.

#### TILBURY FORT.

THE "superfluous veteran" on life's stage who has had the happiness to see the late Charles Mathews as *Puff* and *Sir Fretful*, and the inimitable Mr. Clark as *The Governor*, cannot but feel a certain tenderness towards Tilbury Fort; and may, perhaps, be excused for expressing some disappointment that, in the recent tercentenary doings, it was cast for so very small a part. A salvo of guns was fired from its time-honoured parapets, and that was all.

We are told—apologetically—that neither the Fort nor the noble gateway which the artful sentinels left unguarded were in existence at the period in which the scene of Sheridan's famous farce opens. What then? This is another instance of the inconvenience of that ubiquitous busy-body, the archeologist, who is forever destroying our illusions, leaving barren spots in place of bright memories, and casting for us, unasked, the balance on the wrong side of life's ledger. It is possible to be, in some things, over-accurate; and there is a knowledge which is unwisdom. We believed the whole Elizabethan story, and "we were blest in so believing." And then there comes a "pragmatic, conceited fellow" who puts us right on points whereon it was our pleasure, and, in a sense, our profit also, to be wrong. Where is this kind of meddling with antiquity to end?

An erudite friend explains, with offensive plausibility, that the Twin Blockhouses which Henry VIII. built and connected by a "boom" or chain—the one on the Kentish the other on the Essex coast—with their poor little flanking batteries à *fleur de'eau*, armed with toy culverins and demi-sakers and "such small gear," were all that in the shape of permanent defences denied to the foe the passage of Gravesend Reach in the stirring times of good Queen Bess. In the reign of Charles II., after the Dutch had sailed saucily up the Thames and destroyed our shipping, a "regular" fort of the conventional type was, it appears, designed by Sir Martin Beckmann, and was seen in active progress by the observant Evelyn, who noted with satisfaction that it promised to be indeed a "Royal work." It is one of the few remaining English forts on the Continental trace, and its *escarpment* is now pretty much as its builders left it, although advancing military science has robbed it of its title to be called "respectable," as the old phrase went. For all that, it is still, to us at least, eminently respectable in many ways, and will well repay a holiday visit. The quaint old buildings which dot the interior irregularly are,—it is said, mostly of Georgian date, and never could have harboured the fair form of the distraught Tilburina. Perhaps so. They are, at any rate, substantial,—which is not a modern attribute,—and they are not unpicturesque, set snugly in their trim gardens of old-fashioned flowers and bordered by level stretches of greensward. The ruddy brick-work of their walls and chimneys, and their brighter moss-covered roofs, tell pleasantly against the background of stately trees, and there is an air of repose and serenity about the dear old place which cannot fail to soothe the wandering citizen, whom the authorities, under proper safeguards, courteously admit. These buildings *must* be very old! Archeologists don't know everything!



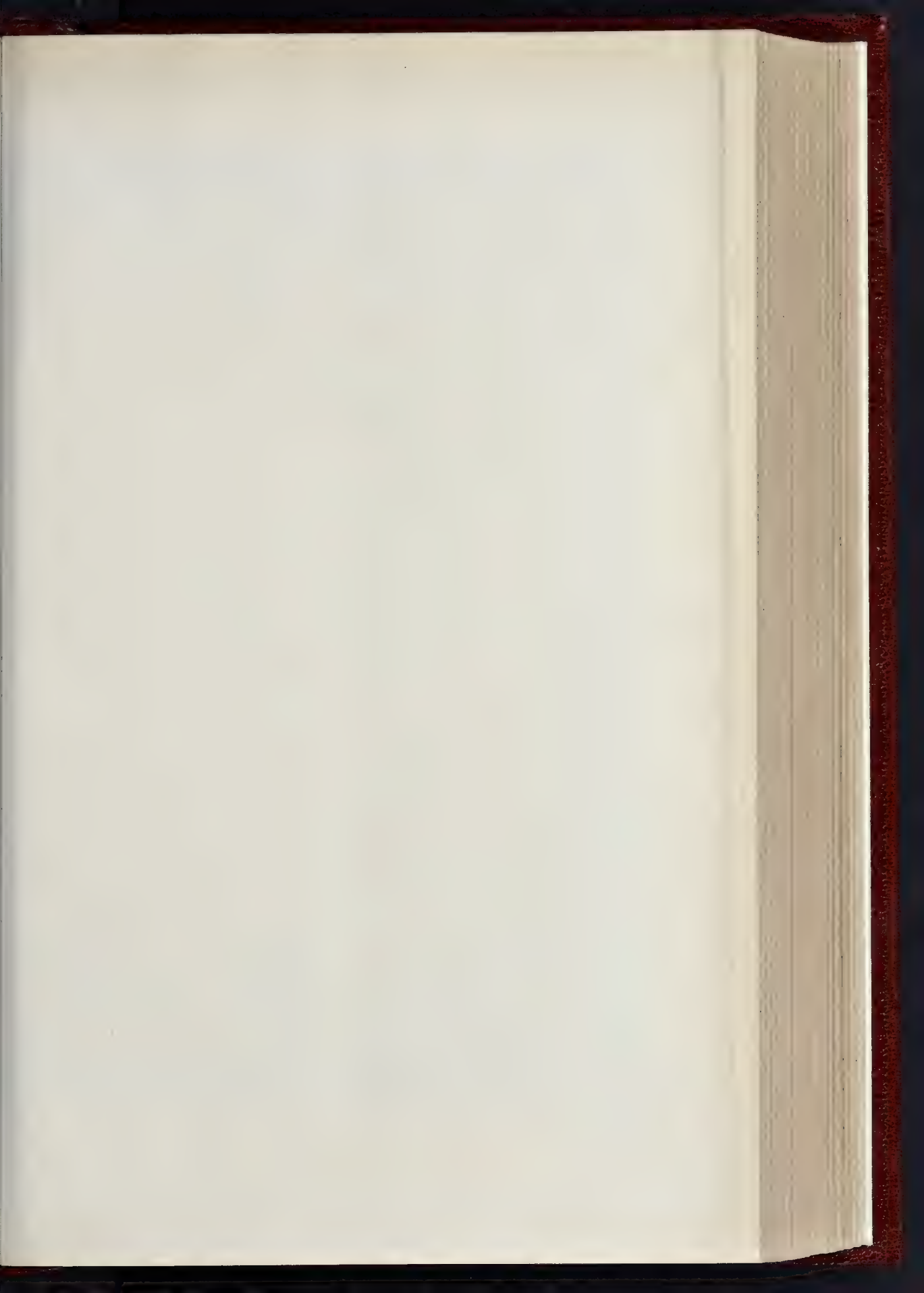




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PAINTING INTENDED FOR THE "SALLE DU CONSEIL ACADEMIQUE" OF THE NEW SORBONNE, PARIS.

BY M. BENJAMIN CONSTANT.





On one side of the main entrance to the Fort is a simple structure, the upper portion of which, approached from the ramparts, is used as a chapel for the garrison. And here, it is easy to see, personal zeal has done much for the beauty of God's house and the decencies and amenities of Christian worship.

On the other side is the canteen, in which you may sit and listen to the tales of warriors, accompanied by the lazy plash of the restless tide, the measured tread of the neighbouring sentry, and the laughter of the soldiers' children playing about the sunny slopes and open spaces of the old Fort.

Over the gateway there is a room in which tradition says the great Queen herself slept when, in August, 1588, she paid a visit to the camp of her "sweet Robin." The warlike speech with which she encouraged her troops hangs framed upon the wall. No Englishman can fail to be stirred by it, or to feel his blood course quicker through his veins by the heroic associations of the spot. If the Queen slept here, then Leicester, in satin and jewels, sat at her feet. Raleigh, too, and Drake. Sir Christopher Hatton trippingly squared his toes, and the wise Burleigh shook his solemn head. Thick-coming fancies crowd upon us. Why, if—Here our friend interrupts that tradition is in this, as in much else, at fault.

The speech was never spoken, the victory having been gained before the Queen's visit; and, he adds, with a knowing look and a chemical air, as from this classic spot the Spanish fleet could not be seen because 'twas not in sight, so in this room the Queen could not have slept because 'twas not then built. Moreover, he goes on, with tiresome volubility,—Do you suppose that, assuming the Gatehouse to have been then in existence, the "Beauteous Majesty" of England (this with a peculiar emphasis, I don't know why. She was beautiful, I suppose; or is all history mere fiction?) would have left the security of Leicester's camp, with its cordon of 30,000 brave and loyal hearts, for a precarious lodging on the river's brink, open to easy capture or destruction by a daring foe? Henry's manly daughter was too good a soldier for that. Besides, I tell you, there was no such room, nor any similar room in that day, the old Block-house being, in fact, the magazine—unmeet for Beauty's Bedchamber. And then he pointed to an almost invisible date over the arch, which certainly is 1683—nearly a hundred years too late!

This sort of person always follows up a victory, and pours out his stores of odious information, regardless of your finer feelings. This Gatehouse, he proceeds, is presumably the work of Sir Christopher Wren, who was at the date of its erection the "Surveyor of the King's Works," and who would naturally be responsible for the architectural features of a Royal fortification, which evidently made no little stir in its time. It is built of Portland stone, and possesses considerable artistic interest—outline, proportion, detail, all are good. The lower stage, runs on our well-informed bore, is Ionic in style, with a cushioned frieze and delicately profiled entablature. The arch is elliptical—an incongruous form in a Classic design. It has a carved keystone and spandrels, with an enriched impost at the springing level. The upper stage is Corinthian, excellent alike in design and execution. It is flanked by trophies of arms and armour, a little mixed—Roman body-armour and Stuart cannon side by side. In the centre is a vacant niche, and in the tympanum of the curved pediment are the arms of Charles II., exquisitely sculptured and in splendid preservation. On the keystone of the rearward arch is the 'Stuart crown carved in brickwork, which is fast dropping to pieces. The clock is modern, and so are the dormer windows and the wooden partitions dividing the interior, and so also is the—

We escape stealthily from all this twaddle to take a quiet look around. You can make a circuit of the Fort along the crest of the escarp wall, and from the north curtain looking across the ravine you can still discern the old track which led to the camp. The scene presented to the view on that August morning 300 years ago rises before you. The slow approach of the Royal barge with its freight of gaily-clad and jewelled courtiers, its gilding, music and flaunting bravery; the long procession from the shore; the tents and pavilions, gay with a thousand streamers, on the crest of the far-away hills; the cheers of the poor tattered demagogues who formed the bulk of the army, and whose love and loyalty even neglect and

starvation could not kill; the smug citizens proud of their doughty trained-bands, the confusion and the noise, the shouting and drinking, the rough horse-play, the wild revelry and unbounded licence of the camp and its followers, the—

Bother! Here comes the F.S.A. again. More scandal about Queen Elizabeth, I suppose. We will give him the slip, or he will convince us against our will that there was no Queen and no camp, as well as no speech; that "this nose is not my nose, and that nothing that is so is so." No, thank you. Good bye. Some other time will do for—  
J. PENN.

#### THE ARCHITECTURAL ASSOCIATION:

VACATION VISIT TO ST. DUNSTON'S COLLEGE, CATFORD BRIDGE.

OWING to Professor Herkomer's sudden bereavement, which prevented the intended visit of the Architectural Association to the Art Colony at Bushey from taking place, the fifth vacation visit was not made until Saturday last, when a number of the members of the Association went over the new College which has just been erected at Catford Bridge.

It is, perhaps, necessary to mention that this is an entirely new college, which has been built by the Charity Commissioners from funds belonging to the Parish of St. Dunstan's-in-the-East. The College (of which we gave a view, plan, and brief description in the *Builder* for April 21 last) has been planned to accommodate 400 boys, which number includes 60 boarders. It is apparently intended that technical education shall be an especial feature in the curriculum of the school, as large workshops for both carpentry and engineering are provided, besides physical and chemical laboratories.

The party was received by Mr. Clifton, the son of the architect, and proceeded to inspect the drawings in the large hall. The building has a long line of frontage towards the road, from which it is set back some distance, while to the rear are three blocks at right-angles to the main front, the central one being the hall, with serving-room, &c., connecting it with the kitchen and servants' block on the eastern side; while the workshops, with laboratories over them, form the western block. It should be mentioned that the main front of the building faces nearly south.

The principal materials used externally are red bricks, with cream-coloured terra-cotta dressings, and Broseley tiles for the main roofs and plain red tiles for the smaller ones.

The principal entrance is in the centre of the front. From this a corridor runs to the two ends of the building, with doors at each end.

Most of the class-rooms are on the south front, to the right of the centre; the front rooms on the other side being devoted to the head-master, assistant-masters' common room, the secretary's office, &c. All the class-rooms are warmed by means of Galton stoves, placed in the angles, and are arranged so as to secure a left-hand light to the scholars.

The large hall is opposite the main entrance, with a gallery over the entrance, and at the other end is a large window filled with stained glass representing the various crafts which it is intended shall form part of the education given in the establishment. In the head of the window is the figure of St. Dunstan, also the City arms.

As, besides the occasional use of the hall for large gatherings, as on Speech Day, it will be used daily as a dining-hall, it has double hatches communicating with a serving-room, provided with hot-table, &c.

The school lavatories and boot-room are placed outside the main building, but are accessible under cover. There will be a covered playground and five-courts provided. The cricket-field immediately adjoins the playground to the west.

The engineering workshop is large and well lighted, with solid wood-block flooring in the centre, but with a narrow width of cement flooring on both sides and the end, on which the lathes and steam-engine will be placed. The carpenters' workshop is of similar size, but has wood-block floor only. Both these workshops will be warmed by means of hot water. The chemical and physical laboratories are provided on the first-floor; there is also a special class-room for drawing, with top as well as side light.

The sleeping accommodation for the sixty boarders is provided for in four dormitories

with fifteen beds in each, while the bedrooms of the two assistant-masters, who will reside in the building, are so placed that each of them overlooks two of the dormitories.

The dormitories are provided with lavatories in the centre of the room, with both hot and cold water laid on to every basin, while good bath-room accommodation is also provided.

It is not intended that the head-master shall live in the school building, but it is proposed that he shall have a detached house in the grounds; this, however, has not yet been commenced.

It is intended to open the College in October next.

#### SANITARY CONFERENCE AT BRIGHTON.

ON Saturday last the Association of Public Sanitary Inspectors of Great Britain held, by invitation of the Mayor (Alderman Martin), a public conference on "Sanitation" in the Royal Pavilion, Brighton. About 180 members of the Association from all parts of the kingdom attended, and these were supplemented by a large number of the Brighton Town Council, members of the Hove Board of Commissioners, and representatives from other south coast towns, including the Mayors of Hastings and Lewes. The Mayor of Brighton publicly received his guests, who at 11 o'clock proceeded to the North Drawing-room, where the Conference was held.

Mr. Hugh Alexander, Chief Sanitary Inspector of Shoreditch (Chairman of the Association), then took the chair, his first duty being to apologise for the absence of the President, Mr. Edwin Chadwick, C.B., whose advanced age precluded him from taking part in the proceedings. He had, however, sent his address, which would be read by Dr. Richardson, and it was a full protest against all the evil influences which stood in the way of the full development of sanitary science. Speaking of the objects of the Association, he said it did not exist merely to obtain certain advantages for its members, but was the outcome of the general consciousness of its members that the *status* of sanitary inspectors should obtain proper recognition, seeing that it and the interests of the public health were one and indivisible, and he claimed that the high purposes of the Association would commend it to all classes of society.

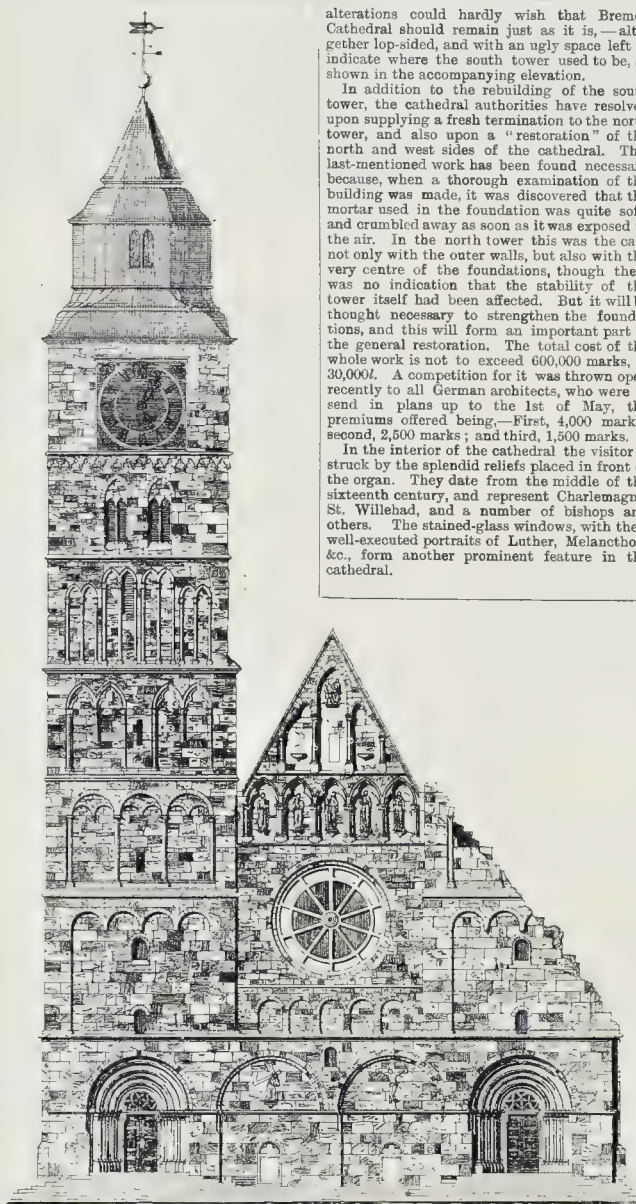
The Hon. Secretary (Mr. Samuel C. Legg) then notified that letters regretting inability to attend the Conference had been received from the Mayor of Croydon, Dr. Alfred Carpenter, Earl Fortescue, the Right Hon. J. Stansfeld, Sir Douglas Galton, Sir W. T. Marriott, M.P., Sir Francis Wyatt Truscott, Sir Guyer Hunter, and the Town Clerks of Brighton and Croydon.

Dr. B. W. Richardson then rose at the call of the Chairman to read the President's address, prefacing it with a few observations as to Mr. Chadwick's health. He said he wished to assure the members that their President was not in any danger, but it had been deemed prudent that he should not venture to Brighton. He had been suffering from a local attack of pain, and had had to summon medical aid, but the symptoms had abated, and Mr. Chadwick was now able to get about, and his intellectual aptitude was as great as ever. He hoped, although he was now so far advanced in years as 89, he would for a very long time occupy his post as their President. Dr. Richardson then proceeded to read the address, to which we may return hereafter.

Subsequently the party visited the Corporation Water Works at Goldstone Bottom, and afterwards they inspected the arrangements adopted for sewer flushing.

**Wootton Court, Kent.**—Near to the high road across Barham Down from Canterbury to Dover, and about midway between that city and the seaport, stands Wootton, formerly known as Woodton, Court. Part of the house is believed to have been built by John de Guestling in the reign of King John. The main edifice consists of a fine Queen Anne residence, which stands in a goodly park of some 150 acres. The entire property, divisible, if desired, into twelve lots, comprises Swingfield Park, two farms, with various small holdings, &c., and covers 654 acres, in all yielding a computed rental of 1,106*l.* The advowson to Wootton rectory will be included in the sale, which is fixed for the 20th inst., at the Mart, Token-house-yard.





Bremen Cathedral: West Elevation, with South Tower gone.

#### RESTORATION OF BREMEN CATHEDRAL.

It can hardly be alleged against the people of Bremen that they have shown undue haste as to the restoration of their cathedral. The south tower of that edifice (which dates back to the eleventh century) collapsed so long ago as the year 1638, and it is only now,—just two centuries and a half afterwards,—that a competition has been formally invited for the reconstruction of this tower, and for the carrying out of various alterations and improvements essential to the putting of the cathedral into a sound condition. Certainly the most ardent opponent of modern

alterations could hardly wish that Bremen Cathedral should remain just as it is,—altogether lop-sided, and with an ugly space left to indicate where the south tower used to be, as shown in the accompanying elevation.

In addition to the rebuilding of the south tower, the cathedral authorities have resolved upon supplying a fresh termination to the north tower, and also upon a "restoration" of the north and west sides of the cathedral. This last-mentioned work has been found necessary because, when a thorough examination of the building was made, it was discovered that the mortar used in the foundation was quite soft, and crumbled away as soon as it was exposed to the air. In the north tower this was the case not only with the outer walls, but also with the very centre of the foundations, though there was no indication that the stability of the tower itself had been affected. But it will be thought necessary to strengthen the foundations, and this will form an important part of the general restoration. The total cost of the whole work is not to exceed 600,000 marks, or 30,000*l*. A competition for it was thrown open recently to all German architects, who were to send in plans up to the 1st of May, the premiums offered being,—First, 4,000 marks; second, 2,500 marks; and third, 1,500 marks.

In the interior of the cathedral the visitor is struck by the splendid reliefs placed in front of the organ. They date from the middle of the sixteenth century, and represent Charlemagne, St. Willehad, and a number of bishops and others. The stained-glass windows, with their well-executed portraits of Luther, Melancthon, &c., form another prominent feature in the cathedral.

course of this month] the authorities of the cathedral are to meet again for the purpose of making final arrangements, and it is believed that the work will be speedily commenced with good earnest.

#### Illustrations.

##### DECORATIVE PAINTING FOR THE NEW SORBONNE, PARIS.

WE give an illustration this week of the large painting which has been executed by M. Benjamin Constant as a decoration for the "Salle du Conseil Académique" of the new Sorbonne, at Paris. The painting forms an important contribution to the *Salon* of the present year.

As will be seen, and as already described in our article on the painting and sculpture at the *Salon* some months ago, the painting is in the form of a triptych. The centre compartment shows a group of portraits of the Deans of the Sorbonne in their official robes, the Rector M. Gréard, in the centre. In the distance are seen the dome of the church erected by Richelieu.

The group of men in the right-hand compartment represent the Sciences, while Literature is symbolised by the group of women in the other compartment.

##### COMPETITION DESIGN FOR EDINBURGH MUNICIPAL BUILDINGS.

WE give the elevations and the plan of one floor of the design submitted in this competition by Mr. Alfred Broad. The author says:—

"The ground-plan shows the general arrangement; and on the floor above the Council-room would have overlooked the High-street, with arcades and galleries on the floor over that. The court-yard is on the same level as Cockburn-street, whence stairs and lifts communicate with all floors. The apartments were proposed to be warmed with open fire-places, the larger ones, as well as corridors and courts, by means of low-pressure hot-water coils. Ventilation was to have been on the "Plenum" system, the warm fresh air being propelled by a "Capel" fan through ducts communicating with the various rooms, &c., and regulated by Tobin valves, the foul air being carried away by shafts conducting it to the tower.

Externally the style chosen is a Venetian development of Renaissance, selected as adapting itself to the different heights necessitated by the levels of the adjoining streets."

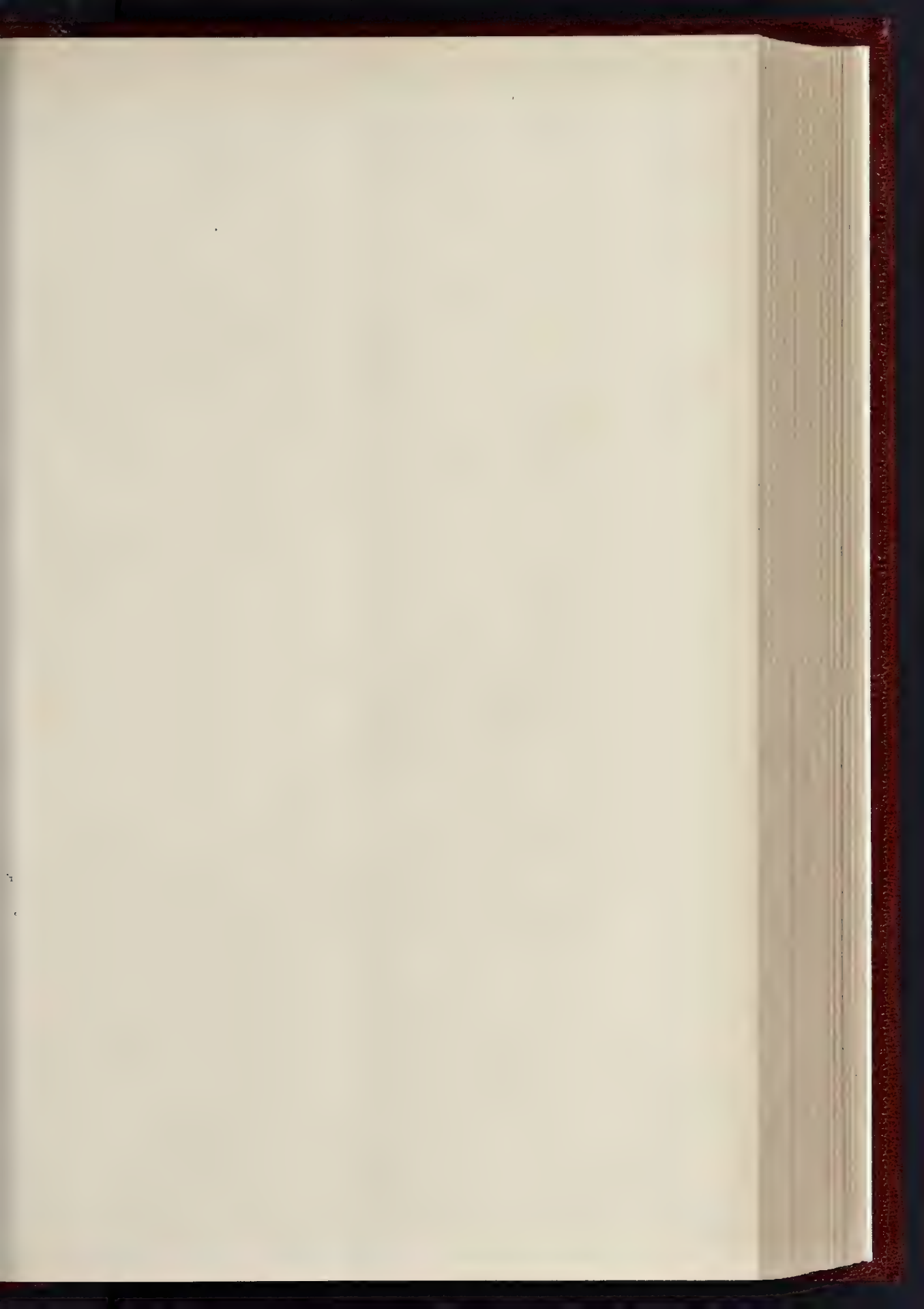
##### CHURCH OF ST. JOHN-THE-BAPTIST (R.C.) BRIGHTON.

THE builder who, in 1835, erected the church of St. John-the-Baptist was both builder and architect; he did his best to make the exterior of the same pattern as St. Mary's, Moorfields, but made no endeavour to give architectural character to the interior beyond running a poor cornice round the walls, leaving the broad expanse of 35 ft. 6 in. width of ceiling unrelieved; but the roof is a well-proportioned queen-post roof, the trusses being regularly placed with due regard to the position of the openings beneath and all now sound and in order. For architectural effect, and to gain height in the nave, a design has been prepared which involves the removal of the plaster ceiling, and the decoration of the construction of the roof by wrought-iron work and casings, as shown in the illustration given this week. The drawing also shows the proposed treatment of the large gallery at the entrance end, which, by the addition of columns and screens, is to be re-arranged and divided into organ-gallery, a tribune for the nuns of the adjoining convent, and a central chapel of the Holy Rood, in which the large memorial group of the Crucifixion now on the floor of the nave will be placed; beneath the gallery the central portion is enclosed as an ante-chapel.

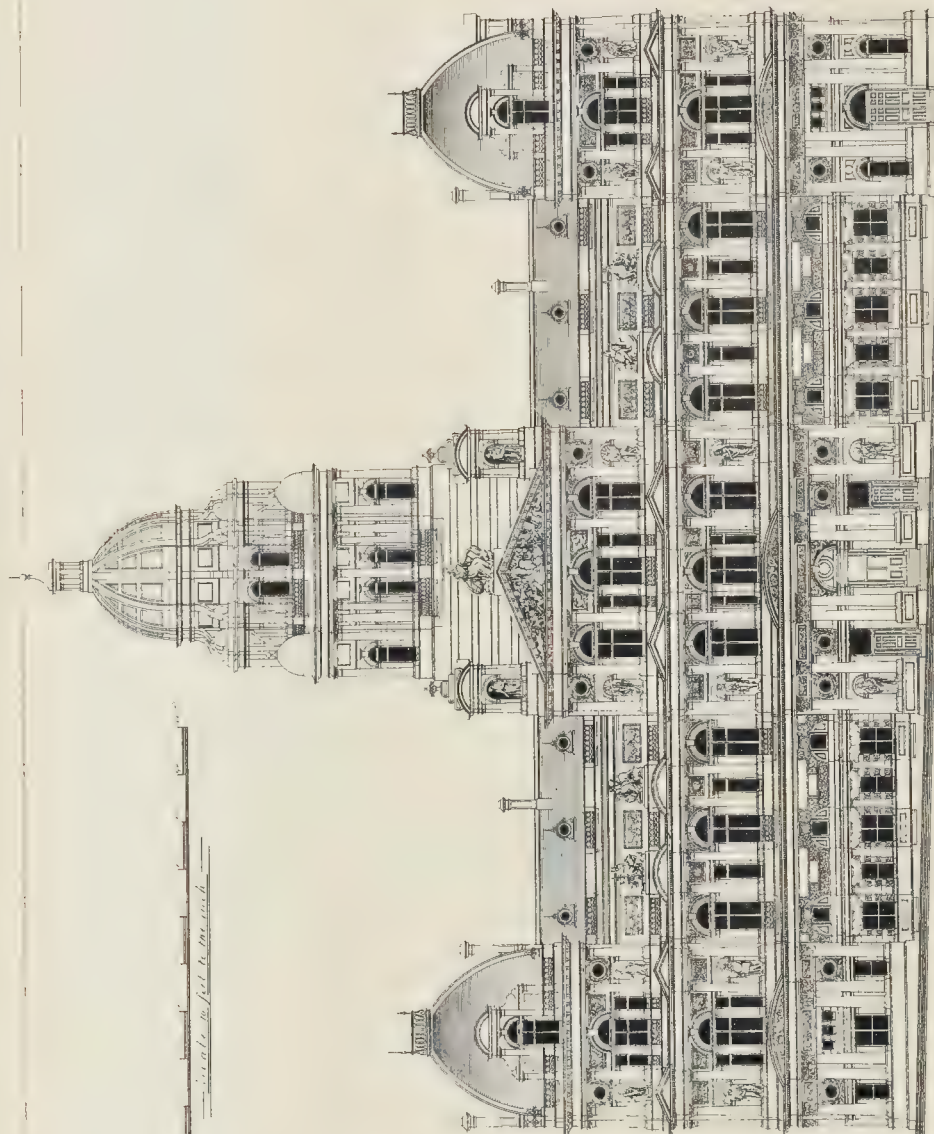
The church is enriched by several fine works sculptured in marble by Carew, including the altar, with its group of the Baptism, the font, and the memorial to Mrs. Fitzherbert; all these will be carefully retained, as also the very good glass in the windows, by Westlake, which will unite with the scheme of polychromatic decoration arranged by that artist. The design for

The competition brought in some forty sets of designs from architects in Bremen, Berlin, Aix-la-Chapelle, Cologne, and other parts of Germany. These were displayed to the public in the Bremen Kunsthalle, and eventually the judges awarded the first prize to Herr Bau-Inspecteur Salzmann, of Bremen, by whom, in accordance with the terms of the competition, the work will be carried out. The strengthening of the foundation was commenced at once, as it was thought inadvisable to postpone this part of the restoration any longer. Various alterations in details were, however, suggested by the judges as regards the general plans, and these have been made accordingly. In the





THE BUILDER, SEPTEMBER 1, 1898.

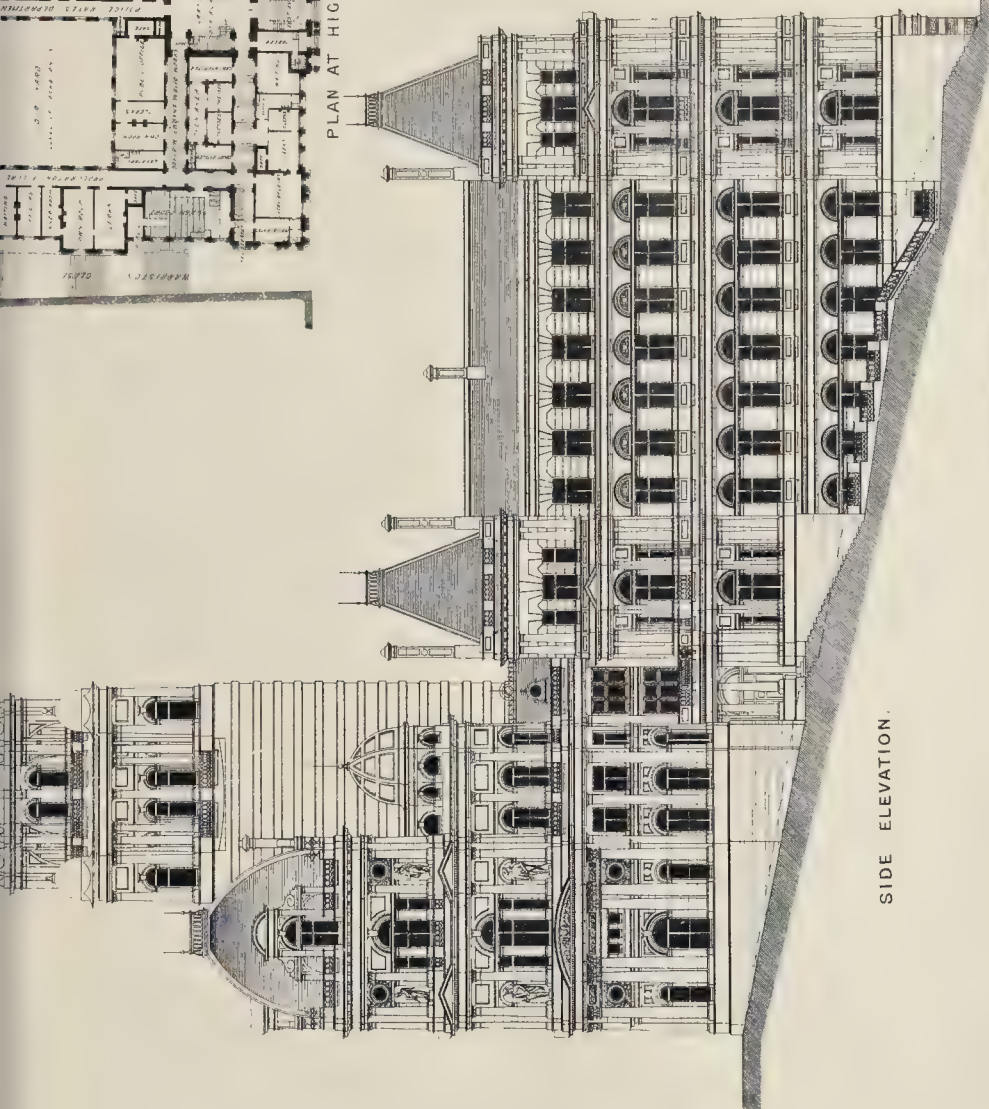


ELEVATION TO HIGH STREET.





PLAN AT HIGH ST LEVEL.



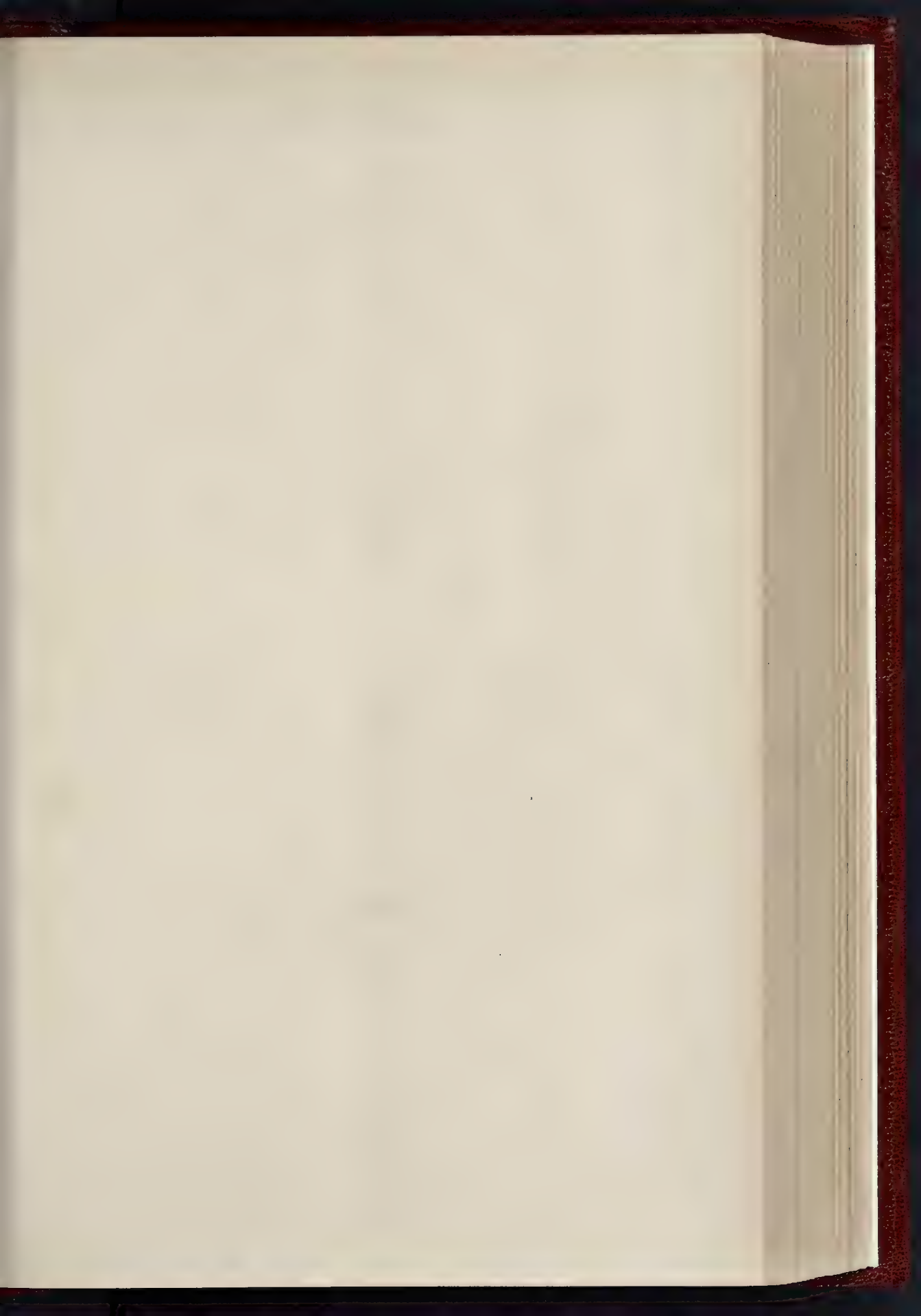
SIDE ELEVATION.

PHOTO LITHO SURFACE & 22 MAR 1916, AND ANTON ST. LONDON E.C.

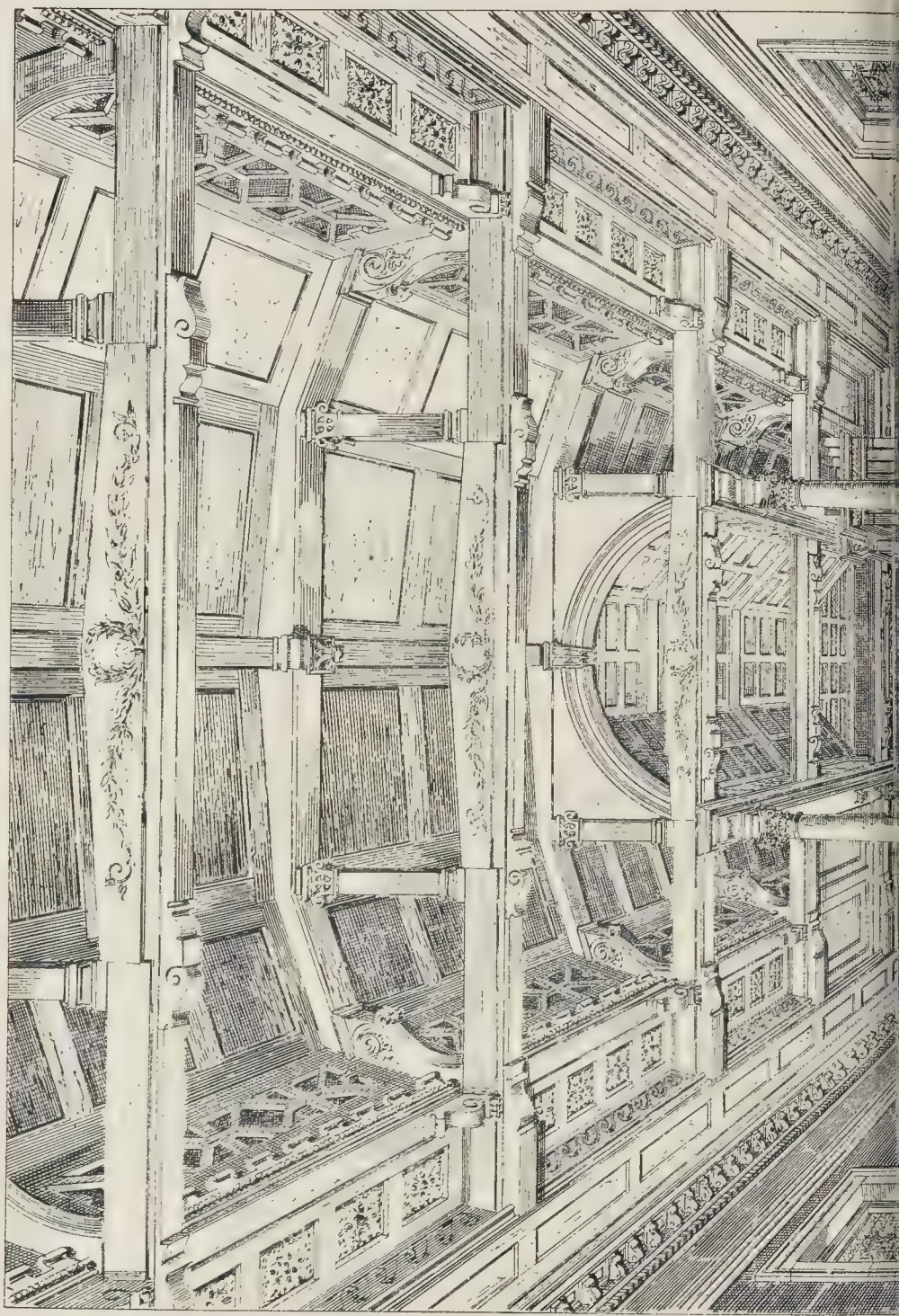
COMPETITION DESIGN FOR EDINBURGH MUNICIPAL BUILDINGS.—By MR A. BROAD, A.R.B.A.







THE BUILDER, SEPTEMBER 1, 1888.











exterior, with a plan, was given in the *Builder* of May 21, 1887. The architect is S. J. Nicholl.

he drawing from which the illustration is taken was exhibited in the Royal Academy exhibition of this year.

\* As this drawing was published in a contemporary journal last week, it is necessary to state that its author arranged with us for its publication some time previously; that it was sent to us since selected and dated for publication in this issue of the *Builder*; and that Mr. Nicholl has apparently thought proper to hand over for publication in another paper without communicating with us. Comment is unnecessary.

**LEAMINGTON MEETING OF THE ROYAL ARCHEOLOGICAL INSTITUTE.** VISITS TO LEICESTER AND MELTON MOWBRAY. *WE* this week conclude our special account of the Leamington Congress of the Royal Archaeological Institute.

Monday, August 13, was fine, and the archaeologists were at work at an early hour. Taking the train to Hatton, they were thence conveyed by carriage and brakes to Baddesley Clinton, where they were received by Mr. E. H. Ring, the owner, who gave them permission to inspect the house. It is moated and tiled with a drawbridge and portcullis, now used; and, both internally and externally, it is an excellent specimen of a mansion of the fifteenth century. On the party reaching the house, Mr. Rev. H. Norris read a brief description of the leading features, and explained its name as being the "ley" or meadow, of a Saxon thane named Bado or Badd. Before the Conquest the site had formed a portion of the Forest of Dean, and at the Conquest it was given to Guy de Ferrars or Ferrers, who seems to have held also some twenty other lordships. It passed, mostly by the marriages of heiresses, to the Clintons, Comingsbys, and Catesbys; one of the last-named family left the estate to Nicholas Brome, whose daughter Constance conveyed it by marriage to Edward Ferrers, who died in 1535. It was a member of this family, Henry Ferrers, on whom the legend drew so largely in compiling his "History of Warwickshire." It is sad to have to record the fact that Henry Ferrers' MSS. were never restored to their rightful owners, and that eventually they passed into the Staunton Collection, which was burnt along with the Birmingham Public Library a few years ago. The house itself, which reminds the traveller of Igham Moat, in Kent, is not quadrangular; it occupies three sides only of a quadrangle, the bridge leading to the entrance is somewhat high, having been erected probably when part of the moat was drained, and its portal arch is probably no older than the sixteenth century. The rooms are small, but have remarkably fine wood chimneys, and from end to end are filled with family portraits, some good, and some very poor, though for the most part not wanting in interest. The windows are rich with heraldic shields and emblems. The staircases and upper rooms have some priests' hiding-places, which doubtless have often been utilised, as the Ferrers family, so long the owners, have ways been of the Roman Catholic faith.

Finding it impossible to spare time for a visit to the parish church, which stands at a respectful distance beyond the moat, the party drove to Knowle. Here they were met by the Rev. Canon Howe, who conducted them over the church, explaining the leading features of the fabric, and its history, stating that it had belonged at one time to the Abbey of Westminster. The party admired the fine sedilia in the chancel, the oak chests, the entrance to the lod-loft, and also the monuments of Walter Cooke, founder of the Collegiate Church here, and the other memorials of the past; and the Rev. Canon amused them with extracts from the register, showing that the entries of marriages celebrated here in some years of the seventeenth century far exceeded the average. They also inspected the old house of the College, close by, the parish church of Solihull was next visited, but not until the party had partaken of luncheon at the village inn. The church is a noble structure, early English, and partly Decorated in style, and it is remarkable that the tracery and other ornaments of the windows are as nearly as possible uniform throughout. On the north side of the chancel is an excrescence of two

stories, the lower one probably intended as a mortuary, while the upper one, known as the Chapel of St. Alphege (the patron saint of the church), was originally designed as a chantry chapel. At Meriden Church the next halt was made, and the building was inspected under the guidance of the Rev. L. Willett, who explained the history of some fine sepulchral effigies and a very late brass—dated, we believe, 1638. Some of the party here ascended the tower to see the extensive view which it commands, reaching as far as the Malvern-hills in one direction, and to those of Leicestershire in the other. Berkswell was next visited. Here the party was joined by the members of the Warwickshire Naturalists' Field Club, under the direction of Mr. W. G. Fretton, who called attention to the Norman features of the church, and expressed an opinion that originally there had been here a central tower. This he was led to conclude from the fact that the Norman arcade on the north side of the nave terminated in a respond, just where the western arch of the tower would be expected to be found—evidences of extensive alteration being visible where, in this case, the northern arch of the tower would have been, but where there is now a pointed arch. He also referred to the crypt under the centre of the church, long used as a burial-place for the Wilmot family, as supporting this theory, as the western part of it was under the position which the tower would occupy, while the eastern portion of the crypt was apparently intended to be used as a mortuary chapel. A descent into the crypt, which was made by most of the members present, tended strongly to confirm this view. Mr. Fretton also drew the attention of his hearers to the remarkable rising in the floor of the church from west to east, and also gave some curious entries from the registers of the parishes of Solihull and Berkswell. On leaving the church, the greater number of the party paid a visit to the sacred well, near the western tower, which gives its name to the parish. It was a matter of great regret to the archaeologists that Temple Balsall, with its quaint old Templar Church, which was put on the programme for a visit, was obliged to be left out for want of time. The archaeologists then remounted their carriages and drove to Berkswell Station, from which they returned to Leamington in time for dinner and for the "concluding" evening meeting at the Town-hall. And this brought to an end the pleasant Warwickshire excursions of the Congress. From first to last the excursionists had been favoured with fine dry weather, neither too hot nor too cold, and with just enough of sunshine to make the churches, castles, and mansions which they had visited put on their most attractive appearance.

It was rather late in the evening when the "concluding" meeting assembled at the Town-hall, with the Rev. Sir Talbot Baker in the chair, when a variety of formal resolutions were proposed and unanimously carried, in strict conformity with the precedents of previous years. The first resolution was a vote of thanks to the Mayor and Corporation of Leamington for their hospitality, for the use of the Town-hall, and for other acts of kindness and attention. This was followed by other votes of thanks to Lord Leigh for his kind and courteous conduct as President of the Meeting; to the clergymen and other gentlemen who had thrown open their churches and mansions, and in other ways contributed to the success of the gathering; to the members of the two Leamington clubs for admitting the members of the Congress to the use of their buildings; to those gentlemen who had read papers at the evening meetings or had acted as interpreters at the various churches, castles, and mansions which they had been allowed to inspect; and finally to the organising secretaries of the Congress, Messrs. Gosselin and Hartshorne, and to the local honorary secretary, Mr. S. S. Stanley, to whose care the members of the Institute had been so largely indebted for the comfort and convenience which they had experienced during their visit to Leamington, and for the complete arrangements as to carriages, horses, and trains in connexion with all their excursions. It is almost needless to add that all these resolutions were carried by acclamation.

But as in the theatrical world the "positively last appearance" of a "star" is not always quite the last, and is generally followed by at least one or two others, so the "concluding" meeting was but the precursor of two "extra days" which were spent in examining some of the historical and architectural antiquities of

Leicestershire. Accordingly, on Tuesday, the 14th, some thirty or forty of the party took the train, *via* Nuneaton, to that ancient city, where, on alighting, they were met by Colonel Bellairs. From the station they went straight to their headquarters at the Bell Hotel. Then, meeting at the new market cross or clock tower, they proceeded on foot to an inspection of the remains of antiquity in the town. They had pointed out to them the town-house of the Earls of Huntingdon, as they passed by it; but their first halt was at the entrance to the old Castle. Its front of brick is only of the time of George III., but the foundations and much of its walls, there is reason to suppose, are of the middle of the twelfth century. Internally it was once one spacious apartment, consisting of a central hall and side compartments like the aisles of a church, open from end to end. This arrangement is now much disguised and concealed by its subdivision by interior walls into two courts of assize. It is on record that from the close of the thirteenth century down to our own day the judges have held their courts within these ancient walls, the two courts having been separated by nothing but a thick curtain of cloth suspended across the centre, down to the year 1821. It was here that meetings of Parliament were held during the latter part of the fourteenth and the first half of the fifteenth century. The great likeness between the interior of this structure and that of the Castle at Oakham struck several of the archaeologists, and was made the subject of remark and comment. The Turret Gateway, which they next inspected, formerly divided the original "bailey," or chief courtyard, from the area of more recent date, now known as "the Newark," or "Newarke." The gateway, even in its ruins, still indicates its original purpose, as is shown by the grooves for a portcullis in its outer arch. It dates, probably, from the fourteenth century. The old dungeon or prison of the castle, which runs below the structure above described, was next visited. It measures about 40 ft. by 25 ft., and is not more than 10 ft. or 12 ft. in height; it has one aperture,—it can scarcely be called a window,—which serves only to "make darkness visible" and to ventilate the room; and near it is a flight of steps, which led up into the castle-yard and to the courts of (rather summary) justice. The place began to be used as early as the fourteenth century for the county and city prison; and yet some of the party were inclined to think that it was only a storehouse. Numerous "masons' marks" are still to be seen on the stones which line its walls, and names and initials of very old date are carved in some places on the sides. The visitors were next introduced to the Newark, a place enclosed, as they were told, by Henry, Earl of Lancaster and Leicester, early in the fourteenth century, and long used by him as a parade and exercise ground for his followers in arms. An old ivy-covered house, which they passed on the left hand, was stated to have been once the abode of a body of chantry priests who took part in the services of a church in the Newark long since demolished. Next they were shown the "Magazine," an old castellated gateway, very extensively repaired and restored in our own day, so cunningly restored, indeed, that it would puzzle many an architect to decide as to whether it is ancient or modern. "It has been converted," writes Mr. J. Thompson in his "Handbook of Leicester," "into a depot for the arms of the Trainbands in 1682, and was hence called the Magazine; it is now once more used for a similar purpose—namely, as a place of deposit for the muskets and accoutrements of the Leicestershire Militia." The party were next shown the two stone arches which still remain to mark the site of the Collegiate Church of our Lady in the Newark, and were then taken to Trinity Hospital on the northern side of the square. Externally it has been sadly "beautified" in the last century, and the passer-by would be inclined to regard it as a large, long workhouse or almshouse; but an inscription over the door tells us that it was "Built in 1331 by Henry, Earl of Lancaster, as a place of refuge and support for a hundred poor and weak men, and ten able women to support them." Its inmates are still a hundred old men, who have each a room and small pension and rations; but the women have increased from ten to twelve. At one end is the chapel, the eastern portion, and probably the chancel, of a much larger structure. The floor at the east end is adorned with curious tiles, and the windows near the Communion table are of the Early English and Decorated styles. On the north side stands the tomb of



Mary de Bohun, the first wife of Henry, Earl of Derby, afterwards King Henry IV. It is made of alabaster, and has an embattled border, with a row of four escutcheons underneath. The drapery is fine and well preserved, but the features of the recumbent figure have been greatly damaged. Among the curiosities shown in this hospital to the visitors were a large porridge-pot of ancient metal, and an old nutmeg-grater, ornamented with a variety of quaint devices and household advice, and bearing on it the date 1579.

The next visit of the party was to the old Town Hall, once the Hall of the Guild of Corpus Christi. It is approached by a narrow street leading into Mill-lane, and is well worth a visit. It is low and somewhat gloomy, being panelled with dark wood, and its sill has its original roof. It is now used, as the party were given to understand, as a school of cookery. It is, however, of more than ordinary interest as a genuine relic of the Civil War, for on its outer walls fell the principal fire of the Royalist guns at the siege of Leicester, on May 30, 1645, by Prince Rupert. An adjoining apartment, smaller in size, called the Mayor's Parlour, is decorated with an old seat of justice for the Mayor, and a very finely-sculptured mantelpiece; and its windows are enriched with rondelets of glass of the fifteenth century, some representing figures of saints, and others exhibiting "emblems" of the months; while the smaller glass-panes have in diaper-work the well-known sign of the Corpus Christi Guild, namely, the chalice and the consecrated Host above it. Adjoining the Town Hall are the Muniment Room, Wigston's Hospital, and the old Town Library, which were all inspected by the party. The library contains, *inter alia*, a fine copy of Walton's "Polyglott," and the "Legenda Aurea Sanctorum," A.D. 1476.

Close to the Castle and the Newark stands St. Mary's Church, to which the party were next directed. This is a large building, partly Norman and partly of a later date, built upon and into the remains of a Saxon substructure. Traces of Saxon work are to be seen at the south-western corner of the nave, and also above the present later arcade, to insert which, apparently, the original walls were pierced. About the year 1280 the Norman arches of the nave were converted into pointed ones, and the exterior of the church was altered about the same time by the addition of the south aisle, which would appear to have been used for parish purposes only, while the nave and chancel belonged to a college of priests. Here the guide of the party read the following interesting passage from the work of the late Rev. George A. Poole, Vicar of Welford, on "The Churches of Leicester":

"The changes in the plan and fabric are intimately connected with the ecclesiastical position of the church. It had been originally, and still continued to be, a collegiate church; but it also became, at some early date, a parochial church also; and, whether or no from the first, yet certainly in course of time, the south aisle was used for the parash offices, while the original nave and chancel were retained by the Abbey. To the necessity hence arising for a larger south aisle we may refer to the fact that the present south aisle, of so very disproportionate dimensions, for the Early English aisle, which had itself supplanted the original Norman aisle, was erected some time about the close of the thirteenth century, together with the tower, on which still remains the weather-mould, showing the place of the original roof. . . . Very shortly after, A.D. 1400 an important change took place in the ecclesiastical establishment. Hitherto there had been a dean and seven canons, all instituted by the Abbot, except one who was called 'Vicar' of the parish, and who was instituted by the Bishop. But in that year, by the advice of Bishop Beaufort, and with the consent of the Abbot, it was ordained that either the Dean or the Sacrist should be also the Vicar of the parish. This, of course, brought again the conventual church (that is the nave and chancel) and the parash church (that is, the present south aisle) into closer relations; and about this time came several changes which tended to throw the two together, and to assimilate them in architectural character, as they had before been rendered as much as possible independent of each other. For the former purpose, that is, to facilitate a community of services between them, the two aisles leading out of the chancel into the aisle were opened, and, as insuring uniformity of character, as well as a more frequent communication, when roofs were needed both to the nave and the south aisle, the high-pitched roof of the aisle (the eaves of which would come down too low against the nave) was changed into a nearly flat roof, resting on a clearstory, built for that purpose over the original south wall of the aisle, and, of course, in the Perpendicular style. At the same time, windows similar to these were inserted in part of the Early English clearstory of the nave, a pair of nearly identical windows being supplied to both nave and aisle. Thus were the architectural features of the Church of St. Mary, in-Castro, conventual and parochial in one, fitted for its double use, and assimilated with its ecclesiastical constitution."

We have no space left to describe the other leading features of the church, which were minutely pointed out to the party by Colonel Bellairs and Mr. Jackson,—the fine font of "Transitional" style; the double-recessed

Norman arch at the west end, with its chevron moulding and the bold carvings of its door; the wide range of clearstory windows in the south wall of the church; with the lofty arches on all sides, the carved woodwork of the roof, St. Ann's Chapel on the north side behind the pulpit, the sedilia in the chancel, the door of the old rood, and last of all, the painted windows. The church, the visitors were told, however, had yet another interest, for it is believed that the voice of Wycliff has sounded within its walls, and that John of Gaunt may have attended mass here, to say nothing of Geoffrey Chaucer, whose wife was a sister of the second Countess of "time-honoured Lancaster."

St. Nicholas Church, a quaint old cruciform building, built largely with red bricks mixed up with the original stone,—bricks probably taken from the Roman walls close by,—was the next object to which the party bent their steps. The plain round arches in the north wall, with flat unmoled soffits, are certainly Early Norman, if not veritable Saxon work, and they are composed of Roman materials. Between the south aisle and the nave two fine arches were clumsily thrown into one by some churchwardens or other Vandals of the reign of William IV., at the cost of some forty pounds! It will take double that amount to repair the mischief and bad taste of these "church restorers." The archaeologists had pointed out to them an old timbered and plastered house, with an overhanging story, opposite the church, as that in which (if local tradition is to be believed) John Bunyan once at least preached, and where John Wesley lodged when he visited Leicester.

The Jewry Wall, which nearly joins the tower of this church, is well known by photography to the general reader. It is clearly the same work as that seen at such Roman stations as Colchester, Verulam, Lincoln, York, and London; and it probably was connected with one of the chief gates of the city when occupied by the imperial legions. Not far from the Jewry Wall the archaeologists were allowed to inspect a fine specimen of Roman pavement, *in situ*, in the basement of a small house in Jewry Wall-lane. It is about 20 ft. square, and consists of a continuous pattern of geometrical scrolls, interlacing knots, and other such subjects, all surrounded by a richly-coloured border. The entire work is composed of minute tesserae of various colours, which still become bright on being slightly moistened and rubbed. It is some 6 ft. below the level of the street, and was probably laid down before the third or fourth century of the Christian era. It contains no figures of either men or other animals. It probably formed the floor of the *atrium* or the central *salon* of the mansion of the Roman general in command of a legion or a cohort. It ought to be mentioned here that the pavement and the house which contains it have been purchased and are kept in repair by the civic authorities of Leicester: an example of public spirit which other towns and cities, including London, might very well follow.

Coming away from this interesting spot, it had been the intention of the party to see the Bow Bridge, over which Richard III. passed on his way to Bosworth Field; but its stone arches were left unvisited for want of time; and great regret was expressed on learning that the old "Blue Boar Inn," at which the king slept on the night before that battle, is now numbered among the things of the past.

The other buildings in Leicester visited by the archaeologists were St. Martin's, All Saints', and St. Margaret's Churches. The first-named of these exhibits a curious mixture of Norman and Perpendicular architecture, and it has a wooden porch on its northern side. This church has had among its incumbents more than one member of the gifted family of Vaughan, one of them being Dr. C. J. Vaughan, now Master of the Temple and Dean of Llandaff. In the chancel is the chapel of the Herrick family; and several famous bell-founders are buried within its walls in other parts of the fabric. All Saints' is almost wholly Geometrical in its style, and though not very large or very remarkable in any one particular, is an excellent example of what a town church should be. It has been said of it that "All Saints' Church affords more hints than all the rest of the churches in Leicester for a town church of moderate pretensions." St. Margaret's is large and spacious, and has at its west end a tower which very nearly resembles the type so common

in Somersetshire. In its chancel, which is short, is a fine monument to Bishop Penny, the last Abbot of Leicester who exercised episcopal jurisdiction. The church is remarkable for the sweetness of the tone of its peal of bells.

In the evening, the Town Museum, in the New Walk, so rich in specimens of natural history, and in objects of antiquarian interest, was thrown open to the party by the kindness and courtesy of the Town Council; and, though only about twenty of them accepted the invitation, the Chairman of the Museum Committee welcomed them to Leicester with a few kind words. Among the objects which specially interested the visitors were a Roman *milliarium*, or milestone, found near Leicester in 1771; some Roman vases and Samian ware, a bronze fibula, &c., also found in the neighbourhood; and fragments of two other Roman pavements discovered in the Cherry Orchard and High Cross-street about thirty years ago.

Wednesday, August 15, the very last day of the Congress, was devoted to a visit to Melton Mowbray, the churches in its neighbourhood, and Ratcliffe College, near Sileby, of which Father Hirst (who, it may be remembered, opened and presided over the Antiquarian Section of the Congress at Leamington) is the Principal.

At Melton Mowbray the Vicar explained the chief features of his noble and interesting church, which he had thoroughly repaired and restored in a style which elicited much approval, though one or two members dissented from that opinion, thinking that he had made too clean a sweep of some of the church furniture. It was agreed, however, that the removal of the pews and galleries had brought into view the fine proportions of the pillars of the nave and transepts. The Vicar pointed out some fine tombs with Latin inscriptions in the south transept, especially one with a Latin inscription which could not be explained upon any rules of grammar. The visit was obliged to be cut short by the bugler's summons to luncheon, after which the party proceeded in brakes and carriages to Burton Lazars Church, where their first halt was made, and where Mr. J. T. Micklethwaite, F.S.A., acted as interpreter. Colonel Bellairs met them at Borough of Burgh, or (as it is now spelled) Burrow Hill, which was minutely inspected, and which most of the party seem to think was, as Nichols styles it in his "History of Leicestershire," a Roman encampment, though possibly adapted by the Romans, having been originally held by the Britons. Having taken tea at the house of a neighbouring squire, the party pushed on to Ashby Folville and Gaddesby Churches, to each of which they were able to devote only a hasty glance. They reached Ratcliffe College at six o'clock, in time to partake of tea on the lawn in front of its buildings; and it is needless to say that they admired the grand front, and the College Library (formerly the Chapel), both of them the works of the elder Pugin, designed and built by him not long before his death. The walls of the Library were adorned with rubbings of monumental brasses, and with prints and pictures; and other articles of taste and vertu were exhibited under glass cases. The missals, vestments, crucifixes, and altar vessels were much admired; and the favoured few of the members of the Congress who were invited to dine and sleep at the College left its hospitable doors next morning, and said farewell to Father Hirst and his reverend brethren, with a feeling of regret that the Archaeological Institute's Congress for 1888 had become a thing of the past and a matter of history. It will be long, however, before its pleasant memories will fade quite away.

**Cape Town Sewerage.**—The authorities of Cape Town, as is well known, have had considerable difficulty in connexion with the sewage and sewage disposal works for that city, and, although the cost must be of considerable magnitude, nothing yet appears to have been definitely done to remove the difficulties consequent upon such a state of things as at present exists. After considering numerous proposals to deal with the sewage, the Municipality of Cape Town has finally retained the services of Mr. Edward Pritchard, M.Inst.C.E. of London and Birmingham, who has gone to the Cape to make a personal inspection of the district, and to prepare a comprehensive report thereon.

\* A manuscript is extant in Leicester which attests the fact that in 1673 John Bunyan was called upon to produce his preaching licence by the magistrates.



# THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION:

## FURTHER EVIDENCE.\*

SIR JOSEPH BAZALGETTE, the Engineer to the Board, recalled and examined by the Chairman, said that the Chelsea portion of the Thames Embankment was executed by Mr. Webster. The contractors for the new bridge at Battersea are Messrs. Williams, Son, & Wallington. The bricks being used for that work were according to the specification. The witness said he wished to correct one or two points in his former evidence. He was asked some questions at a previous sitting respecting the material used for the filling-in of the Thames Embankment. His memory did not go back a quarter of a century at the moment, and he had forgotten that the matter had been made the subject of a very large amount of inquiry and correspondence. He now put in that correspondence, where there were a great many letters from himself, and some portion of the correspondence had been published and made part of a Blue Book, and some portion had not. It was the portion which had not been published to which he wished to direct attention. That part of the correspondence had reference to the use of the material from the river dredgers. It was suggested to witness that there would be a difference in cost (to the contractor), between using material dredged from the river, and materials taken from the land, of something like 80,000*l.*, but that was entirely erroneous. He found that the figures were as follow:—The total filling-in of Contract No. 1 (*i.e.*, Mr. Furness's part of the Embankment) was 546,664 yards. Of that, as would be seen by the report of Sir John Hawkshaw, Mr. Harrison, Sir John Coode, and others who investigated the subject, there would be 20*ft.* backing of clay puddle placed at the back of the river wall to ensure its safety; that took 100,000 cubic yards. The excavation for the Metropolitan District Railway, which passed through it, took out another 100,000 yards; the excavations for the foundation of the wall itself, and the puddle in the dams, produced 82,000 yards, these three items making a total of 282,000 yards, leaving 263,000 yards to be taken from the river. He found that the Board paid the Thames Conservators, for dredging, 11,119*l.*, which, at 6*d.* per cubic yard, represented 410,000 cubic yards, but that quantity went into two contracts, both Furness's and Ritson's. Though he could not divide them exactly, he thought it might be fairly assumed that all the remaining 263,000 yards required for Furness's contract were taken from the river. If the whole of the 282,000 yards which came from the clay backing and the excavations for the railway and the wall had been taken from the river, and all estimated at sixpence a yard, which was the price the Board paid, it would amount to 27,000*l.* So that, assuming that the material could have been got for nothing (which was not the fact, with the exception of a comparatively few cartloads from buildings in the neighbourhood), then the difference of cost to the contractor would only be 27,000*l.* instead of 80,000*l.* The stuff which was put in was really better for the purpose than the dredgings from the river. The clause as to the filling-in material in Mr. Furness's contract did not contemplate the taking of the whole of the material required from the river. Constant complaints were made by the contractors as to the slowness and irregularity with which the dredgings were supplied, and as to the unsuitability of some of the material. On the other hand, the Thames Conservators complained that the contractors did not supply a sufficiency of barges to take the material brought up by the dredgers if the latter were kept at full work.

Mr. Thomas George Fardell was the next witness called. He said he was a member of the Board, but was only elected four years ago—in June, 1884,—so that at the time when the London Pavilion was first let to Mr. Villiers he was not a member of the Board. In the autumn of 1884, when it was proposed to let the new site to Mr. Villiers, he opposed the proposal, not that he had then any suspicion that anything underhand was going on, but he thought the site was one of the finest in London, and he felt that the proper course would have been to put it up to public auction. He also thought

that it would be a mistake to put a music-hall of the "Pavilion" type on such a site. He understood at that time that the view of Mr. Villiamy as to the value of the site had been supported by the valuations of Mr. Cates and Mr. Reed; but it was only since the Commission had been sitting that he had ascertained that Mr. Reed (of course he could not answer for Mr. Cates) never gave a professional opinion at all on the subject. Until the evidence given before the Commission witness was in no way aware that Goddard, Robertson, and Villiers were in any way mixed up together in the affairs of the London Pavilion; but, being a member of the Committee of the Board which was inquiring into Robertson's conduct last year, he was perfectly satisfied in his own mind that Robertson and Villiers were in collusion together, although he could not prove it. The first sitting of that Committee was held in January last year. In consequence of what transpired at that sitting witness moved, at the next meeting of the Board, that in future all lettings of sites should be put up to auction. The particular reason he had for making that proposal was that some time previously, in October or November, 1886, there was an article in a newspaper (he thought it was the *Financial News*) which referred to the circumstance that when a reporter of the paper went to have an interview with Mr. Robertson, he noticed that some of the best sites were ticked on the plan which was before Mr. Robertson. That was before Mr. Robertson was called before the Committee, and it struck witness as such a remarkable circumstance that he at once took the matter up, and eventually carried a resolution at the Board which prevented in future the letting of any sites without their being put up to public auction. He saw that if what was stated by the *Financial News* was the fact, all was not right, although he did not anticipate such disclosures as had since been made. The witness then went on to describe the action he had taken in the matter—how he had repeatedly voted for Robertson's dismissal, and how he had been in a minority; how, on July 29, 1887, he moved a resolution inviting the Government to appoint a Royal Commission to inquire into the proceedings of the Board, and how that motion had been defeated by one vote—Mr. Saunders voting with the majority. Subsequently witness had been active in bringing about the appointment of the Royal Commission.

Mr. Hart Bennett, one of the Assistant-Engineers to the Board, was called to speak as to the alleged substitution of inferior bricks for those specified to be used for the Southern Low Level Sewer. He said that, as far as he knew, the bricks specified by the Engineer were used; but he was not the person who had the passing or refusing of them. That duty devolved upon the late Mr. John Grant. Witness was prepared to say that on the section of the sewer which he superintended, bricks of the quality specified were used for the respective positions indicated.

Mr. John Gooding, sworn and examined by the Chairman, said he was employed under Mr. Edward Bazalgette on the works of the new Battersea Bridge. The contractors had not used any bricks there that were contrary to the specification. But large quantities that were not of the desired quality had been rejected.

Mr. Arthur Cates, called and sworn, said, in answer to the Chairman, that he was an architect in the Department of Woods and Forests. He had observed that a statement had been made that Mr. Villiamy's view as to the value of the Pavilion site had been supported by "Mr. Cates." He presumed he must be the person referred to. He was not aware of any other surveyor of that name. He was not in any way consulted as to the Pavilion site, and expressed no opinion as to its value. Had not seen any plan of it. He had occasion to see Mr. Villiamy at different times on various matters of business, and Mr. Villiamy then frequently asked him for information respecting his dealings with land that had recently taken place. On one occasion Mr. Villiamy particularly asked him with respect to dealings with land in Piccadilly, with reference, he said, to what was likely to be done when the new street, Shaftesbury-avenue, was opened. Witness gave Mr. Villiamy such information as occurred to him at the time, but it was merely in a conversational manner. He certainly gave no definite expression of his view as to the value of the Pavilion site. If he had seen a plan of that site he certainly should have expressed a different view with regard to the frontage.

Mr. Francis Hayman Fowler, F.R.I.B.A. (until

lately a Member of the Board), re-called and further examined by the Chairman, said he was desirous of making some additions to and corrections of his former evidence. He said that he advised Mr. Earle Bird (who had been his client for seventeen years) upon the plans of the Albany Estate at Walworth, which had been rejected by the Board. He received a fee of 50*l.* for that and other matters. He had also advised Mr. Bird as to the development of a building estate at Brixton, and his charge for that work included a measured survey and adjustment of boundaries to the estate, and several incidental matters. Mr. Bird personally made the necessary applications to the Board for the definition of the line of frontage. The plan Mr. Bird submitted to the Board was part of the general survey which witness made. For that and other matters he was paid 50*l.*, but that included the survey as well as the plans. Witness had also advised a Mr. Brown upon laying out a small property at Balham, and made plans. He was architect to the estate, and made designs for the houses, and also plans for the use of the magistrates in the matter of an application for excise licences; he also made plans for the formation of the roads, which plans had to be laid before the Metropolitan Board. Mr. Brown was a builder himself, and personally applied to the Board. Witness received 25*l.* as his remuneration in that case. The plans that Mr. Brown submitted were plans prepared from witness's surveys. Witness having mentioned a number of other cases in which he had been consulted on matters which afterwards came before the Board, proceeded to refer to the Criterion Theatre, in regard to which, in 1883, he advised Mr. Webster, the contractor, as to a system of ventilation. Witness devised a scheme for getting rid of the then existing system of artificial ventilation by steam fans and otherwise, which, in the event of a fire occurring, would have been altogether dangerous, and for substituting instead thereof an entirely new means of introducing the air direct into the theatre, so as to have a natural system of ventilation. In 1886 the Artisans, Labourers, and General Dwellings Company consulted witness as to the interpretation of Section 14 of the Building Act Amendment Act of 1883, as applicable to building over areas of forty-nine houses of varying depth in the rear, situate in the Harrow-road, and adjoining the Grand Junction Canal. Plans were made of the forty-nine houses, and witness, to the best of his ability, advised what amount of the areas should be covered over, and how they should be covered over in order to comply with the Act. He sent his views to the Company, as requested by the Board of Directors. The Company then made their own application to the Metropolitan Board of Works. The Company asked his opinion because they were in a difficulty with the District Surveyor. Witness did not remember whether he was at the Building Act Committee when the Company's plan for those houses were brought forward. All that witness advised was that the Company should act in conformity with the Act of Parliament. The special point upon which his advice was sought was as to how the areas at the backs of the houses could be built over. Under Section 14 of the Building Act Amendment Act, 1883, the requirements as to areas at the rear of houses were altered, and there was a good deal of difference of opinion between the District Surveyors as to what was the proper area and as to how that area was to be dealt with—whether it should be taken from the level of the ground-floor, or whether it should be wholly in the basement, and upon that question witness gave an opinion, which opinion, he believed, had been generally received as that of the profession, and it was also, he thought, the legal opinion as expressed by the magistrates. The Company had not previously been before the Board with the application; they came to him beforehand to ask his advice. Examined as to the case of the Avenue Theatre, witness denied the statement made by Mr. Emden to the effect that Mr. Sefton Parry was induced by witness to dismiss Mr. Emden as architect of the theatre and to appoint him (witness) to do the work. He had known Mr. Sefton Parry for forty years, and for the past twenty-five years he had been frequently consulted by that gentleman (now deceased). When Mr. Sefton Parry employed him in the matter of the Avenue Theatre Mr. Emden's name was not mentioned. Witness also denied that there was any truth in the statements made by Mr. Snelling in his evidence before the Commission.

\* For summary of previous evidence see the *Builder*, pp. 8, 44, 66, 83, 103, 121, *ante*; and last volume, pp. 134, 446, 466.



He had never asked to be professionally engaged in reference to the works that Mr. Snelling and his friends were carrying out.

We must break off here again.

#### LAZONBY FLAGS, NEAR PENRITH, CUMBERLAND.\*

THESE flags have been used in Carlisle from time immemorial; they are very durable, and give good foothold when wet or dry. Some of these flags in the footways in Carlisle streets have been in use over sixty years, having in that time being taken up, redressed, and relaid. Good selected smooth self-faced Lazonby flags of first quality, when laid on a good foundation on a 1-in. bed of ground mortar, will wear evenly down from 3 in. to 1½ in. in thickness, or less.

The second quality flags do not wear evenly, nor are they durable or desirable for heavy traffic in public street footways.

The author has, however, seen no flags which are equal to good self-faced first quality Lazonby flags. The following is the geological formation of Lazonby flag rock:—

#### Permian Rocks between Penrith and Carlisle.

Permian { St. Bee's Sandstone.  
Red Shales, with Gypsum.  
Magnesian Limestone and Plant beds.  
Penrith Sandstone.

The Penrith Sandstone is an immense mass of orange, red, and yellowish sandstone, forming the lowest member of the Permian group in the district around Penrith.

The Lazonby stone and flags constitute part of the Penrith Sandstone. About Appleby and Brough the lowest beds of this rock pass into a breccia, generally known in the district as brookram.

There are two marked characteristics by which the Penrith Sandstone is distinguished, viz., the large scale upon which the cross-stratification or false bedding is developed, and the angular or sub-angular shape of the quartz grains, which mainly enter into its composition; so excessive is the amount of false bedding, that it is almost impossible to obtain an accurate idea of the amount of the true inclination of the rock.

The Penrith Sandstone, besides being the principal source from which all the local building stone is obtained, yields excellent flags. These flaggy beds are largely developed on Lazonby Fell, hence they are called Lazonby flags. The lamination of these flags is not parallel to the general plane of the stratification, but is the result of false bedding. Hence the flags do not occur in regular layers, but in detached patches; consequently, a considerable area on Lazonby Fell is covered with rubbish from quarries where flags have either been got or tried for.

Angular or only slightly rolled small grains of quartz covered with a thin layer of hematite form the main constituent of this sandstone. In the interstices between the quartz grains are white, soft, pasty-looking grains, mainly fragments of felspar more or less decomposed. Both the hematite and the felspar act as the cementing material. Mica is very seldom present.

There are some white beds in the Lazonby flags, but not to a great extent. There is no film of hematite round the grains of quartz in the white flags. The matrix is still of felspar, and the greater hardness seems to be due to the filtration through and crystallisation of the secondary quartz round the original grains; hence the bright, glistening appearance.

The analysis of the white beds of Lazonby flags is as follows: Silicio acid,  $\text{SiO}_2$ —95.12; aluminium oxide,  $\text{Al}_2\text{O}_3$ —2.51; ferrous oxide,  $\text{FeO}$ —1.19; calcium oxide,  $\text{CaO}$ —0.18; water, 0.85: Total, 99.85.

A considerable portion of the Penrith Sandstone, especially the upper beds of the series, exists in a soft, half-consolidated state, and is utterly worthless for building purposes.

The lower and harder beds contain a varying quantity of double six-sided pyramids of quartz. The sides are usually well-defined and bright. To these bright crystals is due the sparkling appearance which the rock generally presents.

The crystallised forms seem to be due to the

deposition of secondary quartz around rounded grains as nuclei. Since the crystallisation took place the grains have been partly water-worn prior to final deposition in their present position and before the coating of hematite was formed around them, because the hematite covers both the rubbed and unrubbed faces of the quartz crystals alike.

The Penrith Sandstone rock is coarser-grained, and in this respect is somewhat like a millstone grit, whereas the St. Bee's rock is finely grained and very evenly bedded.

The author noticed in the Nith and the Scar valleys, near Thornhill, a bed of sandstone very similar to the Lazonby beds. This is the only other bed that the author has seen like the one at Lazonby.

#### Comparative Tests.

Comparative tests of Lazonby and other flags were made by:—I. Comparing their absorbent powers; II. Their wear when rubbed on a plain surface; III. Their microscopical appearance; IV. Their wear when subjected to the action of a drill; and V. Their adhesive strength.

#### I. The Absorbent Powers of the Different Stones.

All the stones were carefully dried, weighed, and then immersed in water for twenty-seven hours, and then re-weighed, which gave the following results:—

Tabulated Statement of Weight of a Cubic Foot of Lazonby Stone.

| Name of Stone.                    | Weight per cubic foot when dry. | Weight per cubic foot when wet. | Absorbent powers per cubic foot. |
|-----------------------------------|---------------------------------|---------------------------------|----------------------------------|
| No. 1. Lazonby Old Quarry (white) | 163 15                          | 176 10                          | 2 11                             |
| No. 2. Lazonby New Quarry (red)   | 169 6                           | 161 11                          | 2 5                              |
| No. 3. Lazonby New Quarry (white) | 151 13                          | 154 1                           | 2 4                              |
| No. 4. Bleasfell Quarry (white)   | 147 4                           | 150 13                          | 3 9                              |
| No. 5. Neptstone                  | 150 12                          | 152 10                          | 1 14                             |
| No. 6. Haltwhistle Quarry         | 152 1                           | 155 8                           | 3 7                              |
| No. 7. Caithness                  | 163 4                           | 163 4                           | 0 0                              |

#### II. Wear of Stones by Friction.

All the stones were now reduced to one thickness, 2 in., and placed on a revolving circular metal float for two hours, being all the time supplied with sand and water to assist the grinding. During the two hours they travelled over a space of twenty miles.

Tabulated Statement of Wear of Stones by Friction.

| Name of Stone.                    | Result of test in hundredths of an inch. |
|-----------------------------------|------------------------------------------|
| No. 1. Lazonby Old Quarry (white) | No perceptible wear.                     |
| 2. Lazonby New Quarry (red)       | 1½                                       |
| 3. Lazonby New Quarry (white)     | 1½                                       |
| 4. Bleasfell Quarry (white)       | 1½                                       |
| 5. Neptstone                      | No perceptible wear.                     |
| 6. Haltwhistle                    | 1½                                       |
| 7. Caithness                      | 1½                                       |

#### III. Tabulated Statement of Microscopical Examination of Stones.

| Name of Stone.                     | Description and Remarks.                                                                                             |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| (No. 1. Lazonby Old Quarry (white) | Is a round grit, and the grains very adhesive, having in it a number of small grains pure white and soft like paste. |
| 2. Lazonby New Quarry (red)        | Same as above.                                                                                                       |
| 3. Lazonby New Quarry (white)      | Same as above.                                                                                                       |
| 4. Bleasfell Quarry (red)          | Is a coarse grit, the grains unadhesive and full of vacuities.                                                       |
| 5. Neptstone                       | Same as Lazonby red, or a little more adhesive.                                                                      |
| 6. Haltwhistle                     | Very close grained and very adhesive.                                                                                |
| 7. Caithness                       | Same as Haltwhistle, but finer grain and more adhesive.                                                              |

#### IV. Test by Drilling the Stones.

All the stones were drilled for the space of one minute with a ½-in. drill and loaded on the top with 100 lb. The drill was set to an angle

of 105 degrees, and performed thirty-two revolutions per minute.

Tabulated Statement of Drill Test.

| Name of Stone.                    | Result of Test.                                                          |
|-----------------------------------|--------------------------------------------------------------------------|
| No. 1. Lazonby Old Quarry (white) | Depth drilled 1½ of an inch, taking Lazonby as standard or 100 per cent. |
| 2. Lazonby New Quarry (red)       | Same as above.                                                           |
| 3. Lazonby New Quarry (white)     | Same as above.                                                           |
| 4. Bleasfell Quarry (red)         | Depth drilled 1½ of an inch, taking Lazonby as standard or 100 per cent. |
| 5. Neptstone                      | " " " " will be 79                                                       |
| 6. Haltwhistle                    | " " " " will be 47                                                       |
| 7. Caithness                      | " " " " will be 47                                                       |

#### V. Adhesive Strength of Stones.

All the stones were again tested as to their adhesive strength. The square corner of the flags projected over a space of 4 in., measured on the sides of the square, and the weight was applied 1 in. from the corner, measured on the intersection of the right-angle.

Tabulated Statement of Adhesive Strength of Stones.

| Name of Stone.                    | Result of Test.                                                              |
|-----------------------------------|------------------------------------------------------------------------------|
| No. 1. Lazonby Old Quarry (white) | Weight sustained in lbs. 748, being 141 per cent. of strength of Caithness.  |
| 2. Lazonby New Quarry (red)       | No test, say same or a little less.                                          |
| 3. Lazonby New Quarry (white)     | No test, say same or a little less.                                          |
| 4. Bleasfell Quarry (red)         | Weight sustained in lbs. 265, being 6 per cent. of strength of Caithness.    |
| 5. Neptstone                      | Weight sustained in lbs. 760, being 15 per cent. of strength of Caithness.   |
| 6. Haltwhistle                    | Weight sustained in lbs. 1,642, being 32 per cent. of strength of Caithness. |
| 7. Caithness                      | Weight sustained in lbs. 5,100, being 100 per cent. as standard.             |

#### Digest of the Foregoing Tests.

I. That Bleasfell is 56 times, Lazonby 43 to 35 times, and Neptstone 30 times, more absorbent than Caithness.

II. When subjected to the metal float test, we have Lazonby and Neptstone far the best, not having worn any, Bleasfell only 1/100 of an inch, and Caithness 1/100 of an inch.

IV. When drilled we have Lazonby and Neptstone the hardest, and if we call these the standard, or 100 per cent., we have Haltwhistle, 77 per cent.; Bleasfell, 53 per cent.; and Caithness, 47 per cent.

V. When tested as to strength by applying pressure, calling Caithness the standard, or 100 per cent., we have—Haltwhistle, 32 per cent.; Neptstone, 15 per cent.; Lazonby, 14½ per cent.; and Bleasfell, 6 per cent.

The substance of the foregoing tests have been extracted from an unpublished report made by the author to the Carlisle Town Council thirty years ago.

#### QUANTITIES.

SIR.—The questions raised by the case of Priestley & Gurney v. Stone are of importance alike to architects, surveyors, and builders, and I think should induce some action on the part of those so interested with the view to define the position of surveyors as regards their responsibility.

The object with which bills of quantities are prepared may be said to be almost exclusively for the purpose of obtaining tenders for work in competition; at any rate, no special provision need be made for other cases.

That the quantity surveyor is responsible for the general accuracy of his signed bills of quantities there can be no reasonable doubt; and I think he is responsible for deficiency to the builder and for excess to the building-owner, "privity" being insured to the builder by the surveyor signing the bills, and himself sending them to the competitors.

The surveyor should be, and I believe is, legally bound to exercise such due care and skill as would entitle him to hold himself out to the public as a competent surveyor; the particular degree of skill to which he may have

\* A paper by H. U. McKie, M. Inst. C.E., City Surveyor, Carlisle, read at the recent Northern District Meeting of the Association of Municipal and Sanitary Engineers and Surveyors.



tain may fairly be left to be appraised by the party by whom the appointment is made.

The question is, how can this be best effected as to satisfy the building-owner and the builder that the surveyor accepts his responsibility to the extent already indicated?

The architects are a corporate body (Royal Institute of British Architects). The builders are not, and so cannot act officially on behalf of their brethren.

It seems to me, therefore, that the former body should take the initiative, and by resolution in Council, declare that names of surveyors of not less than seven years' standing) could be enrolled by them, the persons so enrolled undertaking to become responsible for all signed bills of quantities, the precise terms of which undertaking could be legally expressed in clear and definite language.

It may be said this would be a step towards "Protection" and in detriment of "Free Trade;" but that would scarcely be so, since any surveyor at the requisite standing would be enrolled without challenge on his application and signature.

I venture to think some such mode of dealing with a vexed question would clear the atmosphere from its present cloud, and lead to beneficial results.

J. H. STRUDWICK.

August 22, 1888.

SIR.—In reference to the suggestion at the end of the article in your issue of August 18, if any interest your readers to know that what you advise on page 115 is in actual practice in large towns in the West of England, the arrangement being as follows:—

The architect selects the names of (say) half-a-dozen respectable builders to tender (from drawings and a pretty full specification). The builders receive a polite note from the surveyor enquiring whether he shall take out the quantities, and if so, please sign the enclosed post-card "Yes" or "No." The quantities being supplied to those builders requiring them, the successful one pays the surveyor's commission.

EXACTOR OPERIS.

THE METROPOLITAN BOARD OF WORKS AND THE THEATRES.

SIR,—I induced the Building Act Committee of the Board to inaugurate a little reform that I think could be noted in your columns for the benefit of architects and builders of the present for the future, and in order that it may serve as a precedent for the new Council.

It will be in your recollection that Terry's Theatre last year was finished during the Board's vacation. The theatre could not be opened without the Board's certificate. The seal to the certificate can only be affixed whilst the Board is sitting. This is the case at the Court Theatre, in St. James's (Chelsea), and in the same position. It is advertised to be opened in September 20. In the ordinary course the theatre could not be opened until the Board meets again. This would have caused loss to the owners, artists, and others. The Building Act Committee recommended the Board to affix its seal to the certificate, such certificate to be handed over to the proprietor on one of our officers certifying that our requirements had been complied with. The Board adopted this view, and affixed the seal at its last meeting, but the suggestion being only a practical one, it was not noticed by the Press.

CHARLES MOSSOP.

46, Cannon-street, Aug. 23.

ARCHITECT'S LIABILITY.

SIR,—I should feel extremely obliged if you, or any other competent person, would give an opinion as to whether or not an architect can be held legally responsible to make good, at his own cost, under the following circumstances:—A designed and superintended the erection of a warehouse for B, the packing-room being on the ground-floor. After periods of three years dry rot is discovered in the floor of the packing-room, which was constructed in the usual manner—that is, having red deal joists and pugging; the ground being sunk underneath to a depth of 18 in. or 2 ft., and ventilated by means of 9 in. by 3 in. air-bricks, about 9 ft. apart. Should that the air-bricks on the one side have small conical holes in them, and on the other air openings.

BOAZ.

\*. What is the legal liability of the architect in the usual manner—that is, by the filling up the spaces of ground-floor joists with pugging (probably wet when put in), we should say that he is morally responsible for creating a state of things markedly favourable to the development of dry rot, and that to talk of "ventilating" the joists of pugged floor by letting air into the space below it is a remarkable degree of simplicity. If slag put filling had been used instead of plaster pugging, there would probably have been no dry rot.

CEMENT FINISHING FOR PAINTING.

SIR,—A question has been raised during the progress of some works under my superintendence which I should be very glad if some of your readers would assist me to settle. It is as to whether Portland cement rendering on an internal wall, finished with Keene's as a thin coat of plastering, is liable to develop a deleterious product injurious to paint on the surface?

In the case under consideration, the lower part of the internal walls of a church is being plastered, preparatory to the application of painted decoration. The church, which is situated in a seaside town, was built some thirty years since, and the upper part only of the walls was plastered—in these cements.

In the decorations then carried out, a scaling process, accompanied by a white efflorescence, is very noticeable in that portion only of the building more immediately exposed to the sea breezes; and as this occurs impartially on stone, brick, and plaster surfaces alike, it is fairly obvious that the cause lies in the mortar. To remedy this, certain effective precautions are being taken, such as the raking out and cementing of the mortar joints, and external painting with a silicate, &c.

But it is pointed out, independently of this, that the property above-mentioned, in the use of Keene's cement over Portland in the portions to be newly plastered, is likely, in the course of a year or so, to seriously injure the new painted decorations.

So far as my own experience goes, I have not observed such an injurious result follow from the use in combination of these two cements; but, as my informant is a man of some practical knowledge, and as I am anxious that every precaution should be taken to ensure the permanence of the new decorations, I am induced to appeal for assistance to the practical experience of your readers as to the wisdom of employing these two cements together when the surface has to be painted.

AN ARCHITECT.

The Student's Column.

ARTIFICIAL STONES.—IX.

Artificial Stones partly formed of Organic Matter (continued).

IPMANN, Schnackenburger, & Co.'s artificial stone was composed of a mixture of cement and powdered marble or alabaster formed into a plastic mass with a solution of sulphate of potash and gum arabic. Where a water-resisting compound was required, the patentees used a mixture of cement, marble or alabaster dust, and lime slaked with linseed oil instead of water.

Jaynor's composition is a mixture of equal parts of plaster of Paris (or other cement) and resin, one-third of this being added to two-thirds of another mixture made up of sand, broken stone, gravel, &c., moistened with dilute sulphuric acid; when these ingredients have been well incorporated together, one pound of ground sulphur is added to every twenty pounds of composition, and suitable colours may also be worked in. The mixture, being rendered semi-fluid by heat, is run into moulds to form slabs, blocks, &c.

Resin and kindred substances when used as cementing materials in artificial stone are apt to cause them to soften in hot water or in hot situations, and to mitigate this tendency Anderson, in 1872, proposed the addition to the stone of a sufficient quantity of lime, baryta, or magnesia, in order to produce a species of soap with the resin, which remains hard up to 800° F.

In addition to Anderson's patent stone, in which this idea is utilised, there are several other artificial products in which saponaceous cements have been utilised, those of principal interest being the following:—Pizzi's "imitative stone surfaces," composed, firstly, of a layer of common mortar to a depth of about 1 in. to 1½ in., and on this is laid a mixture of fine sand and lime; the prepared surface is then coloured as desired, and treated with a mixture of lime-water, soap, French chalk, or soapstone, by which process the patentee alleges that a "petrified" surface is obtainable.

An American artificial stone, patented in 1876, was also made, with the assistance of a saponaceous solution (manufactured from 10 lb. of hard wood ashes and 8 gallons of water, boiled with any fatty, oily, or resinous substance to form a weak lye, which, after boiling for eight hours, is strained, alum solution added, and thoroughly mixed. To produce the stone, four parts of clean gravel or sand and one part of some good cement are mixed while dry, and then a quantity of the saponaceous solution, sufficient to moisten the particles, is added, and the mixture is pressed into moulds. The insoluble compound of aluminium with the fatty acid of the soap lye is probably one, at any rate, of the efficient binding agents in the mixture. Another patentee claims the use of solutions of fatty acids added to soluble earthy and metallic sulphates as an essential ingredient in impervious and non-efflorescent stone.

Linseed and other oils are used in partial or entire substitution for water by several patentees. Reynaud's artificial marble is directed to be formed of a mastic of zinc white and whitening soaked in a mixture of turpentine and linseed oil, worked up to the consistency of ordinary putty; this, when hard, can be rubbed smooth with pumice, and polished with oil and tripoli. Hamelin's imitation stones, patented in 1817, were composed of sand mixed with powdered earthenware or porcelain, and powdered Bath or Portland stone. To every 560 lb. of this mixture was added 40 lb. of litharge, 2 lb. of powdered flint or glass, and, after well mixing, 2 lb. of grey oxide of lead. These ingredients, having been well milled, are mixed, when required for use, with a suitable drying oil (the preference being given to linseed oil), pressed in moulds and allowed to harden.

In 1839, D'Harcourt patented various artificial stones, of which the artificial granite and marble may be referred to as typical. The former was produced by adding well-picked oakum to a melted mixture of resin, tallow, linseed oil, and whitening; this is then mixed with from six to eight times its weight of dry sand, stirred until thoroughly incorporated, boiled for two hours, and run into moulds. The artificial marble was a mixture of broken marble and clean flint, with the resin, tallow, linseed oil, and whitening compound; a pavement formed of this material is said to polish well.

A composition which obtained provisional protection only, in 1866, and which was suggested as suitable for mouldings, artificial decorative stone-work, &c., was composed of ordinary putty worked up with plaster of Paris, talc, steatite, metallic oxides, and similar materials, and boiled linseed oil, and coated with silicate of soda when set.

Sorel's plastic composition for artificial stone and mouldings, patented in 1857, was formed of a mixture of potato flour or other starch, and zinc oxide, formed into a paste, with a solution containing water, chloride of zinc, cream of tartar, and hydrochloric acid. The compound was said to be fairly hard, and to have the colour and transparency of ivory.

In D. Barker's patent, ordinary stone-making materials were cemented with a mucilage obtained by mixing farinaceous material with a weak solution of potash or soda; the mucilage may be diluted with lime-water or ordinary water. The soluble starch employed here as the cementing material is liable to decomposition, and would be apt to cause the stone to disintegrate.

Cork powder has been utilised by several patentees, and in some cases with a measure of success, the product being light, fairly durable, and a non-conductor of heat.

Grunzberg & Hartmann used a mixture of cork powder and starch with water, which was pressed, moulded, and carefully dried. To make it waterproof, linseed oil, turpentine, or tar may be added. The drying, which must be conducted at a temperature not exceeding 212° F., is an operation requiring great care and judgment. The product is said to be especially useful as a building material for ice-cells, drying-rooms, roofs, &c.

Another very light building stone which resists moisture and decay is prepared by mixing cork powder with cement, sand, lime, and solution of water-glass, with just enough water to give the mixture plasticity. The stones, after moulding, are dried in the air.

A tougher stone is said to be formed by combining the cork with clay, lime, solution of soluble glass, and a small quantity of hair; the clay tends to prevent the separation of the cork particles, and the silicate of lime formed hardens the mass.

Sandford Church, Devon.—A stained-glass window, with figures of Faith, Hope, and Charity, has recently been placed in this church. The work was designed and executed by Messrs. Warrington & Co., of Fitzroy-square.



## Books.

*Nature's Hygiene.* By C. T. KINGZETT, F.I.C., F.C.S. 3rd Edition. London: Baillière, Tindall, & Cox. 1888.

**T**HE author has revised the former edition of this book with the view of bringing the work into thorough accord with existing information, and has added an account of his own recent investigations concerning the action of a number of antiseptics. After describing the chemical elements and compounds of matter, the laws of their combining proportions and their synthesis and decomposition, the author treats of oxygen, ozone, nitrogen, carbonic dioxide, hydrogen, water, and peroxide of hydrogen, and proceeds then to treat of air, respiration, and ventilation; after which he treats of the processes of oxidation, slow combustion or decay, and putrefaction, and the sanitary bearings of these natural processes; then of water and water-supply; of sewage, its nature, disposal, and treatment; and of disinfectants and antiseptics. So far, these are general subjects of hygiene. The author then deals at length with the sanitary properties of the eucalyptus tree, and the essential or volatile oils of this and the pine and camphor trees, to the vapours of which their hygienic influence is due. Of this subject and nearly all others of the book it may be said that *atmospheric oxidation* is the keynote. The essential oils of turpentine and of the eucalyptus and camphor trees undergo oxidation when volatilised into the atmosphere; and if we would understand the sanitary influence of these trees, the properties of the products of oxidation which are thus generated must be closely regarded. It was from the oxidising effects of peroxide of hydrogen that the author was led to the investigation of this subject, during which it was ascertained that, beyond its powers of oxidation, it had peculiar antiseptic properties. From these investigations resulted the discovery of the now well-known "Sanitas" fluid and "Sanitas" oil, which are respectively the aqueous solution and the oxidised oil obtained by oxidising the oils of turpentine, eucalyptus, camphor, &c., by air in the presence of water. One of the derived products of "Sanitas" oil is "Sanitas" powder, and one or another of the three forms suits application in every case requiring disinfection, or the killing of the germs of putrefaction, as the case may be. Whether it is proper to interfere with the natural process of decay of dead organic matter remains a question, to be decided in individual cases by its own circumstances: it cannot possibly be carried out as a general means of doing away with these substances, but it may be, in some cases, proper enough to use a powerful antiseptic, and in others a powerful disinfectant. Offensive exhalations, it may be said, are not always to be destroyed because of the smell, but because they almost invariably carry with them the germs of disease. "Sanitas" contains peroxides, thymol, soluble camphor, &c. In the forests of pine, eucalyptus, and camphor trees, atmospheric oxygen is constantly being absorbed by the essential oils evolved into the air, and "this simple process gives rise to the production of a number of active chemical substances, including peroxide of hydrogen and soluble camphor, all of which purify the air, and enhance the healthful influences of the climate; thus replacing, so to say, the efforts which are made by man, in densely-populated cities and countries, to maintain the health of the public."

In his chapter on sewage, the author says that so great has been the nuisance caused in recent years by the discharge of the London sewage into the river at Barking and Crossness, that a great, but natural and perfectly justifiable, outcry has been the result, and large quantities of chloride of lime and permanganate of potassium have been mixed with the sewage; but the quantity of chemicals thus employed is wholly inadequate to oxidise or destroy the enormous mass of organic matter contained in the sewage. One of the greatest difficulties, he says, of adequately dealing with this sewage lies in the enormous bulk to be operated upon. If the clearer portion of the liquid could be separated from the more solid parts, it could be distributed over a considerable tract of land, for which it would serve as a useful manure, and by which it would be efficiently filtered and greatly purified. In what is called broad irrigation, sewage is distributed over the surface of drained and cultivated land, by which means

the solid parts are arrested, and the fluid part gradually percolates through the land and is finally carried off by the natural or artificial drains. The fluid part, however, does not merely soak through the land, but its constituents are subjected to oxidation in the process. This oxidation is carried on by the agency of micro-organisms, and one chief direction in which it occurs is that of nitrification. The solid parts which are left in the soil are also attacked, and gradually succumb to the influences of hydration and oxidation, yielding as products substances which afford food to the plants growing upon the land.

That is very sound reasoning, and a true statement of facts: much more so than that which follows, viz., that in this country the available land is insufficient for the disposal of sewage by irrigation as an exclusive means of utilising sewage. London alone, the author says, would require 200,000 acres. That would be, taking the population at 4,000,000, an acre to every twenty persons; but we may ask on what evidence of practical irrigation this estimate is founded? It is contrary to all the experience with which we are acquainted, which is that, although where there is plenty of land to be had by merely asking for it, the sewage of twenty persons can be profitably used on each acre, yet, where the question is how little land is necessary for utilising the sewage of a population, an acre to about 100 persons is sufficient, in broad irrigation.

But we quite agree with the author when he says, "Of all the processes of chemical precipitation that have been hitherto suggested for adoption, none have been free from a feature which practically condemns the whole of them, viz., the employment of expensive chemicals in large quantities for the purpose of extracting from the solution certain matters which are therein dissolved in small quantity, with the object of increasing the manurial value of the precipitate. The cost of the chemicals which must be thus employed is much greater than the increased value given to the product. Chemicals, so far as they may be used in the treatment of raw sewage, should be confined to the limits of preventing nuisance."

The book constitutes a valuable treatise on the slow and persistent effect of atmospheric air in reducing refuse-matter to its elements. This property of the air has been long known by experience, and now that it has been explained scientifically, its beneficent action may with confidence be allowed full play.

*London in 1888.* By HERBERT FRY, editor of "The Royal Guide to the London Charities," &c. Continued by S. W. Kershaw, F.S.A., and A. M. Heathcote. London: W. H. Allen & Co.

"LONDON IN 1888" should form a handy and useful book for visitors to London and its environs, since its 264 pages, printed in good readable type, contain a large stock of topographical information, supplemented by a good index and full particulars as to the means and cost of locomotion. It includes eighteen bird's-eye views of the principal streets, which are brought to so recent a date that one of them delineates what in the text is described as "the repair and restoration" along the western side of Westminster Hall. These views are very good after their kind; whilst they offer a striking contrast to the similar presentations in the cartography of London during the last and the preceding centuries. On two of the views are indicated the points of the compass—an advantage that might be well extended to the rest. Having read all the letterpress, we can fairly claim to speak of its merits, albeit the greater part consists of what may be found in larger and more ambitious works. So also are we enabled to say that the descriptive matter contains certain mis-statements, some of them being the mere repetitions of errors, whilst others can be at once corrected on the spot by the observer himself. Thus, to take a few cases at random, the "lions and unicorns" have disappeared from the steeple of St. George, Bloomsbury Church (see our illustrations of August 18th); the carved coat-of-arms is removed from the Strand entrance of King's College to the facade within; the sign of "The Man Loaded with Mischiefs" is still preserved upon the premises in Oxford-street, which, however, are now known as "The Primrose"; Bath-street, Newgate-street, has been gratuitously re-named Roman Bath-street; Pentonville (Model) Prison and the Holloway (City) Prison are quite distinct jails,

and lie three-quarters of a mile apart; and the contents of what used to be termed Queen Elizabeth's Armoury, with the now-demolished Horse Armoury and its vestibule, were rearranged a few years ago in the upper floor of the White Tower. The Thurolo papers were discovered in Old-square, Lincoln's-inn, it is true, but not at No. 24; whilst an eminent bencher of that Society, and horologist, was elevated to the peerage by title of Lord Grimthorpe—not Grimsthorpe. The Templars' original settlement in London was, we believe, not at Thavie's Inn, but more westwards, and, as Stow says, beyond the Holborn Bars. The inner block of Coldbath-square has been replaced with some new buildings of the Artisans, Labourers, and General Dwellings Company. The old plunge-bath is filled in, and its spring diverted into the main sewer. Curiously enough, another—larger, and we are told a more ancient—swimming-bath was discovered close by, within the square; that also has been destroyed. Part of "Terry's" theatre stands on the site of the Cockpit tavern; and Haberdashers' Hall is at Graham-street. The so-called Duke Humphrey's tomb in old St. Paul's was that of Sir John Beauchamp, son to the Earl of Warwick; and Sir Isaac Newton's house yet stands in St. Martin's-street, Leicester-square, and is distinguished by a tablet set up by the Society of Arts. In his design for the tower of St. Magnus Church, Wren, by constructing the arches—as he did also at Christ Church, Newgate-street—had already provided for the opening of the footway which in 1760 was made through the base of the tower in order to relieve the traffic to and from London Bridge. The Guildhall School of Music has removed from Aldermanbury to the new buildings (the late Sir Horace Jones, architect) by the Victoria Embankment, which were opened on December 9, 1880. On page 189 we read, "St. George's Church is best known to the general world by Hogarth's representation in the print 'Southwark Fair'." Hogarth's painting of 1733, the "Bartholomew Fair" of Walpole, is commonly said to have been burnt in the fire of 1807 at Mr. Johnes's seat, Hafod, in Cardiganshire. This is not so; for the original picture, from the Duke of Newcastle's collection at Clumber, was exhibited at Manchester in 1857, being No. 31 in the catalogue of modern masters, and at Burlington House in the winter of 1884-5. The tower from which Kidman is depicted as flying along a rope to the ground is that of the old church of St. George-the-Martyr, which was rebuilt from John Price's design, soon afterwards.

*The Architects' Register.* Vol. III. London: W. Pope, 16, Holborn, E.C. 1888.

"THE ARCHITECTS' REGISTER" is a somewhat misleading title for a book which registers so very little that is interesting to the architect.

It contains a list of architectural societies at home and abroad—not very complete—eight selected addresses, delivered at unspecified dates to various societies in London and the provinces, all duly reported in the professional journals of the period; and some five-and-twenty pages of trade advertisements, to be found everywhere.

Was it worth while to collect this between covers and publish it at half-a-crown? We should have thought that when the eight fortunate gentlemen whose papers, culled out of perhaps eight hundred, had each possessed themselves of a copy, the demand would have been satisfied. However, the book has reached a third volume, and must be presumed to "meet a want." Back volumes are still to be had.

*The Trees of Commerce.* By W. STEVENSON. London: W. Rider & Son, Timber Trades' Journal Office.

THIS is a handy reprint of articles which have from time to time appeared in the *Timber Trades' Journal*, by an author who speaks with the practical experience of half a century.

It is in the main a compilation, and the works of London, Laslett, and others are freely quoted (the poets also finding a place), the result being a very readable book, filled with miscellaneous information on a subject of inexhaustible interest; but it is nothing more. The architectural student still wants a book on Trade Timber, with chromolithographic illustrations; for it is almost hopeless, in the ever-increasing number of woods employed in building and interior decoration, to realise them all



without some other exhibition of their characteristics than mere letterpress affords. Of light treatises on this important subject there are already enough.

**Granites and our Granite Industries.** By G. F. HARRIS, F.G.S. London: Crosby Lockwood & Son. 1888.

THE substance of this work has appeared in our pages. We will, therefore, merely call our readers' attention to its reproduction in a collected form, and refrain from any remarks upon matter which has already received our careful consideration and deliberate imprimatur, rather than this, that we are glad to have been means of eliciting from so capable an author so excellent a treatise.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

12,362, Counterbalancing Window-sashes. P. Barrett.

This patent has reference to those sashes which are arranged so that one counterbalances the other, and being moved upwards as the other is moved downwards. By this invention, whenever desired the upper sash may be moved for a suitable distance downward (for ventilating, &c.) without necessitating the upward movement of the lower sash. The bearings for the grooved pulleys over which the cords or chains pass are formed so that they may be attached to the top rail of the window-framing on the inner side of the upper sash, and about perpendicularly above the lower sash, and the ends of the cords or chains being attached to the inner surfaces of the top as well as of the bottom sash, so that alterations in the usual formation of sashes are not needed. The attachments are made with suitable lever attachments, fulcrumed on bearings, in order that, when desired, the lever may be moved, allowing the chain to ascend on one side of its pulley and descend on the other, allowing also the upper sash to descend. Sometimes, instead of lever attachments, small drums with catch wheels, so that they will not allow the cord to unwind, are employed.

2,817, Fireproof Curtains. M. W. H. Clarke. According to this inventor, a metal frame of T-iron is used, the iron being used in the form of lattice-work braced at the diagonals for strength. Iron guides at the side are used when the curtain is raised and lowered, most of the weight of the curtain being balanced by balance weights and wire ropes passing over pulleys.

2,872, Bricks for Wells, &c. M. H. Blanchard. The shape of the side of each brick made in accordance with this invention forms a portion of the circular or curvilinear outline of the well or other structure, thus obviating the necessity for hand-cutting and trimming. The material composing the bricks is of such density and corresponding strength as to resist great strain from the weight of the superincumbent structure, and thus prevent disintegration from crushing. When the bricks are laid in cement or good mortar and applied to the lining of wells, the percolation of surface-water or other objectionable fluids is prevented from mixing with or polluting the water obtained from a lower stratum. When the bricks are used dry in building a well they are not liable to displacement, and the risk of accidents from such cause is avoided.

16,769, Improved Joiner's Parallel Vice. R. Melnich.

The fixed jaw of the vice which is the subject of this patent is furnished with a bracket or projection, so formed that it may be firmly secured to the bench, or other fixture. It may be secured to the front vertical face of the bench, or let into the same, or the bracket may be secured to the underside of the bench-top. The bracket has a wide dovetail or dovetail groove, in which a slide, forming part of the movable jaw, moves. This slide, of U form, also encloses the screw. A nut is fitted to the fixed bracket by a snug, which drops into a hole or boss in the bracket, and in which the long screw works, and whereby also the movable jaw is operated.

7,940, Opening Windows. G. J. Dolliner (Hamburg).

The object of this invention is to make windows that in such a way that they can be opened both upwards and outwards, but at the same time to combine with this the condition of obtaining a completely airtight connexion between the window-frame and the closed window casements. All the casements have two separate points of rotation, and, in addition, the double hinges of the casements, when opened inwards, descend, and the lower window-bar is made to take off, so that the casement provided can be drawn inwards through the space thus cleared.

8,808, Metallic Roofing-plates or Shingles. H. H. Lake.

This invention relates to a peculiar form of interlocking roofing-plates and shingles for security, and also rendering them more tightly by giving them the effect of earthenware tiles, without impairing their tightness or stiffness. The tiles are

formed with ridges, flanges, and edges, specially designed and struck up in the metal for these aforesaid purposes.

### NEW APPLICATIONS FOR PATENTS.

Aug. 17.—11,889, E. Wilkinson, Window-fasterener.—11,908, W. Stock, Flushing Window-closets, &c.—11,909, J. Stephens and R. Clark, Manufacture of Portland Cement.

Aug. 18.—11,952, J. Donkin, Hand-saws.—11,953, G. Lowry, Windows.

Aug. 20.—11,994, J. Cundall, Damp-proofing for Walls and Foundations of Buildings.—12,017 and 12,018, H. Ramsay, Composite Water-tight Pipe Joints.

Aug. 21.—12,038, W. Orr and P. Brown, Sheet Metal Structures.—12,055, C. Steane, Window-sashes and Frames.—12,061, M. Smith, Chimney Tops, Poles, and Cows.

Aug. 22.—12,107, J. Bean and W. Gaines, Closing Doors and Preventing the Slamming of same. Aug. 23.—12,141, J. Pike, Repeating Automatic Flush.—12,143, A. Read, Catch for Norfolk Latch.—12,173, C. Young, Automatic Bolt for Double Doors.—12,174, C. Young, Lock or Fastener combined with Bolts for Doors and Casements.—12,192, T. Hargreaves, Safety Window-fastening.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

4,123, A. Little, Drains and Flushing.—9,685, E. Fosk, Excavating Machinery.—9,832, J. Wilson, Ventilating Cows or Shaft Tops.—10,504, C. Gorringer, Sieves and Sifting Apparatus.—10,550, J. Pullar, Safety Lock-fast Gear for Actuating Fan-lights.—11,016, H. Hadden, Red Glass.—11,029, A. Knevet, Apparatus for Domestic Fire-grates.—11,398, P. Brentini, Compound for Removing Paint.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

12,379, J. & A. Duckett, Water-closets.—13,180, J. Hargreaves, Manufacture of Cement.—14,098, D. & A. Hall, Stone-sawing Machinery.—14,237, F. Gill, Windows.—14,231, J. Pottier, Fire-places.—14,318, F. Curtis, Wrought-iron Door Latches.—7,815, J. Champion, Lock Bricks.—10,580, W. Thompson, Hinges.

## RECENT SALES OF PROPERTY.

### ESTATE EXCHANGE REPORT.

By CHINCKNOCK, GAINSMORTH, & Co. (at Selby).  
The Carlton Towers Estate:—  
Selby (near to)—Gosquo House Farm and 133a. 2r. £4,000  
Sail Hill Farm and 81a. or. 13p. freehold 5,500  
Cambleforth Hall and 402a. 2r. 34p., freehold 9,500  
Brook Hole Farm and 326a. or. 3p., freehold 5,100  
Freehold enclosure of marsh land, 65a. 2r. 10p. 3,300  
Tithe rent charges, £78. 15s. per annum 1,272  
By WORSFOLD & HAYWARD (at Dover).  
Dover, Strand-street—Northumberland House, 31 years, ground-rent £5. 5s. 700  
42, Council House-street, 39 years, ground-rent £8. 10s. 126  
45, Albany-place, 92 years, ground-rent £2 13s 335  
St. Margaret's—Freehold corner houses 230  
Buckland—15, Oswald-road, freehold 166  
30, Hawkesbury-street, 36 years, ground-rent £12. 8s. 150

By DEBENHAM, TEWSON, & Co.  
Devizes, Wilt.—The mansion known as Devizes Castle, and 42a. 2r. 26p., freehold 8,000  
East Acton, The Chestnuts and The Lodge, and 3a. 7r. 25p., freehold 4,050

By NORMAN & SON.  
East Bedford—The Manor House, and 16a. 2r. 3p. freehold 2,200  
Two cottages, and 3a. or. 5p. 650  
Seven cottages, and 1a. 3r. 19p. 500  
A plot of freehold land 100

By H. J. LANEVARY.  
Woolwich—10 and 11, Albert-street, freehold 375  
A plot of freehold land 180

By C. P. WHITELEY.  
Tottenham, Park-lane—St. Paul's-villa, and ground-rents of £72, reversion in about 80 years 3,300  
Peckham Rye—No. 65, freehold 605

By F. HARRIS.  
Mortingham—Freehold ground-rent of £16, reversion in 74 years; and a plot of freehold land 235  
Lee—No. 36, High-road, freehold 730

By JONES, LANG, & Co.  
Woolwich—1 and 2, Angelsea-place, 29 years, ground-rent £3 870  
7 to 14, Salutation-alley, freehold 815  
Ground-rents of £12, reversion in 32 years 170  
530, Jackson's-lane, freehold 530  
2 to 8, Ripon-road, freehold 1,460  
Plumstead 10, Copeland-terrace, 39 years, ground-rent 2. 8s. 175  
21, 22, and 23, St. James's-place, 35 years, ground-rent £8 10s. 1,200

By A. RICHARDS.  
Tottenham—13, 14, 15, 17, 18, and 19, Townsend-road, freehold 1,650

By NEWSON & HARDING.  
Dalston 15, Albion-road, 57 years, ground-rent £6, King's Cross 17, Lavina grove, 53 years, ground-rent £12 240  
Street—Improved ground-rent of £12. 10s. term 91 years 235  
Ballum Improved ground-rents of £35. 12s., term 80 years 700

By GREEN & SON.  
Wood Green—1 to 7, Edward-terrace South, freehold 960  
1 to 9, Fishmonger's-place, freehold 830  
Caledon-road 4, 5, 6, Clayton-street, 36 years, ground-rent £30 520

## MEETINGS.

### SATURDAY, SEPTEMBER 1.

*British Archaeological Association* (Glasgow Congress continued).—Visit to Doune Castle, the Roman Camp at Ardoch, and Dunblane Castle. (No evening meeting.)

### MONDAY, SEPTEMBER 3.

*British Archaeological Association* (Glasgow Congress continued).—Visit to the Antonine Wall, near Bonnybridge-station, Rough Castle, Falkirk, and Linlithgow Palace and Church. Closing meeting in the Corporation Galleries, Glasgow, in the evening.

*Clerks of Works' Association* (Carpenters' Hall).—Monthly meeting, 8 p.m.

### TUESDAY, SEPTEMBER 4.

*Glasgow Architectural Association*.—Mr. W. J. Anderson (Alexander Thomson Travelling Student) will read a paper entitled "A Tour in Italy."

### WEDNESDAY, SEPTEMBER 5.

*Builders' Foremen and Clerk of Works' Institution*.—Ordinary meeting, 8.30 p.m.

### THURSDAY, SEPTEMBER 6.

*Architectural Association*.—Visit to Hatfield House. (For particulars, see advt. in this week's Builder.)

## Miscellaneous.

**The Private Bill Legislation of the Year.**—The Private Bills passed during the Parliamentary Session which has just been adjourned involve the expenditure of a large amount of capital in the construction of new railway works. The total number of Bills of all kinds which have been sanctioned is 155, and of these 63, or more than one-third of the whole, are railway Bills. Of these successful Bills, 30 are for the construction of new railways and other works by existing and new companies, the length of the new lines sanctioned being 230 miles, in connexion with which the proposed capital is 12,623,000*l*. Amongst the Bills thus authorised is that promoted by the Metropolitan Outer Circle Company (new company) for the construction of 20 miles of railway, at an estimated cost of 1,600,000*l*; a railway, 8 miles in length, promoted by the Glasgow Central (new company), at a cost of 1,800,000*l*; a railway, 21 miles in length, promoted by the Shropshire Railway (new company), at a cost of 900,000*l*; a railway, 11 miles in length, promoted jointly by the Great Western and the Great Northern Companies, for the construction of a line from the Great Western Railway, near the Southall Station, to a junction at Edgware with the Edgware, Highgate, and London branch of the Great Northern Railway, at a cost of 580,000*l*; the Liverpool Overhead Railway, at the Docks, to be constructed by an incorporated company, at a cost of 600,000*l*. For successful Bills promoted by existing companies for the construction of new works the proposed expenditure is 2,000,000*l*. by the Lancashire and Yorkshire Company; 1,200,000*l*. by the Manchester, Sheffield, and Lincolnshire Company; 1,000,000*l*. by the London and North-Western Company; 933,000*l*. by the Great Western Company; 700,000*l*. by the North British Company; 600,000*l*. by the London, Tilbury, and Southend Company; 408,000*l*. by the Bristol Port Railway and Pier Company; 400,000*l*. by the Midland Company; 360,000*l*. by the Rhymney Company; 280,000*l*. by the Bareg Dock and Railway Company; and 200,000*l*. by the Plymouth, Devonport, and South-Western Junction Company. Of Tramway Bills, fourteen were sanctioned, of which four were in connection with additional lines in the metropolis. The Bills sanctioned for the construction of new gas and water works were twenty-five; and for docks, piers, and harbours, thirteen. Amongst the bills of a miscellaneous character sanctioned were the Greenwich and Millwall Subway Bill; the Horse Guards Avenue Bill; the Kensington-square Improvement Bill; the Brighton Marine Palace Bill; the Metropolitan Board of Works Various Powers Bill; the Raleigh Park (Brixton) Bill; the Thames Tunnel (Blackwall) Bill; the Vauxhall Park Bill; and the West Ham Corporation Improvement Bill.

**The Sanitary Institute of Great Britain and the Parkes Museum.**—We are officially informed that the much-desired amalgamation between the Sanitary Institute of Great Britain and the Parkes Museum has taken place, under the title of "The Sanitary Institute" (incorporated August, 1888). We have received a copy of the memorandum and articles of association of the newly-constituted body, which will in future carry on the work of the two societies. The memorandum of association has been signed by Mr. Edwin Chadwick, C.B., Mr. Douglas Galton, and other well-known sanitarians.



**Civil and Mechanical Engineers' Society.**—By permission of Mr. Wolfe Barry, M.Inst.C.E., the members of this Society and their friends have recently made a visit to the Tower Bridge works. Mr. George Scott, representing Mr. John Jackson, the contractor, kindly explained the methods which had been adopted in the construction of the two piers which carry the main towers of the bridge. Each pier has four thick walls surrounding a space into which the weighted ends of the bascules will drop. The area to be covered by the masonry was divided up into rectangular and triangular surfaces, on which caissons of wrought-iron were built. Between each caisson and its neighbour there was left a space just large enough for a man to work in. The caissons were then filled up with masonry, the wrought-iron plates were removed, and the spaces left between each block were filled in. On returning to the launch, Mr. Ellis Hill (Past President), in the absence of the President, Mr. R. Middleton, who had been compelled to leave early, proposed a vote of thanks to Mr. Scott for the admirable way in which he had conducted the party and had explained the works and drawings, and begged him to thank Mr. J. Jackson for his courtesy. Some of the members then proceeded down the river in Mr. Jackson's launch to Greenwich, where they were shown Mr. Maynard Walker's patent machine for the raising of water by the utilisation of the tide. They arrived at high-water, and the machine was allowed to work, and pumped up some 2,000 gallons in a few minutes to a height of 16 ft. above the high-tide level.

**The Railway and Canal Traffic Bill and the Alteration of Railway Rates.**—We are informed that, in view of the immense importance of clause 24 of this Bill, under which all railway and canal companies are to submit to the Board of Trade revised classifications and schedules of maximum rates and charges within six months of the passing of the Bill, the Railway and Canal Traders' Association are forming a special organisation to enable traders and farmers to protect their respective interests when the new rates and classifications are dealt with by the Board of Trade. There can be no question that the alteration will be of the greatest moment to all traders. By the provisions of clause 24, the Board of Trade may publish the classifications and schedules in such manner as they think fit, and may hear any objection against them. It is open, however, to objectors to appeal against the Bills which will ultimately be introduced into Parliament to confirm the schedules, when settled, and the main object of the Railway and Canal Traders' Association is to avoid the expense which would be incurred in appearing before Select Committees in this manner, by efficiently protecting traders' interests, in the first instance, before the Board of Trade. It is understood that the organisation will take the shape of trade section committees, and it is believed that the experience and organisation of the association will enable it to follow up the successes which its representatives obtained when the Bill was before the Grand Committee on Trade. Applications for information respecting the Bill should be addressed to the Secretary, Mr. Edwin Clements, at Eastcheap-buildings, E.C.

**A Trade Festivity.**—On Saturday last a section of the employes of Messrs. Thomas Gregory & Co., builders and contractors, Station Works, Clapham Junction, held their annual excursion and dinner. Leaving Clapham Junction by an early train for Portsmouth, they spent the morning in visiting the Dockyard, Southsea, and other places of interest, and mustered for dinner at Maybon's Restaurant—Mr. G. C. Hudson (one of the partners) presiding, and replying to the toast of "The Firm." The party, numbering about 100, left Portsmouth in the afternoon for the Isle of Wight, returning to Clapham Junction *via* Portsmouth, and reaching home about 10 p.m., after having spent a thoroughly enjoyable day.

**Locks and Door Furniture.**—We have received from Mr. James Hill, of Queen Victoria-street, a new and well-got-up illustrated catalogue of his "patent reversible locks" and door furniture. The catalogue includes illustrations of fanlight fittings and other specialities, and will be found to be very well worth perusal by architects and builders.

**Mr. Mark H. Judge.**—The *Municipal Review* of August 25 contains a portrait and biographical sketch of Mr. Mark Hayer Judge, the Chairman of the Metropolitan Board of Works Inquiry Committee.

**Sale of Land at Overstrand.**—On Monday last Messrs. Baker & Son sold by auction a number of plots of building-land on the Overstrand Estate, near Cromer, the property of Lord Suffield. A special train from London was chartered for the occasion, and a marquee was erected on the estate where those who had come down from London lunched, and where the sale was held afterwards. Until recently, Overstrand has been only a small fishing-village; but a few houses of a better class have been erected within the last year or two on a portion of the lots comprised in the present sale, and as there is an increasing demand for accommodation for seaside visitors on this part of the coast, it seems probable that the purchase of building-land here will prove a good investment. The plots offered were eighty-eight in number, having frontages varying from 17 ft. to 34 ft., and depths of from 120 ft. to 195 ft. Purchasers were present in large numbers, and the whole of the plots were rapidly disposed of, several of the buyers taking as many as six and eight lots each. The prices obtained ranged from 122. to 481. each, one corner plot, having a frontage of 88 ft. and a depth of 194 ft., being sold for 1091., the total sum realised by the several lots being about 1,8001. Nine freehold houses which have already been erected on the estate by Lord Suffield were also offered in lots, and sold for an average of 3201. each, the aggregate proceeds of the day's sale amounting to upwards of 4,6001.

**National Registration of Plumbers.**—A meeting of the District Council for Sussex in connexion with the National Registration of Plumbers was held at the Town-hall, Brighton, on the 24th ult., the chair being occupied by Dr. Ewart, Chairman of the Sanitary Committee. It was resolved that an arrangement be entered into with the Worshipful Company of Plumbers similar to that entered into by other district councils. The following gentlemen took part in the discussion:—Councillor Dr. Ewart, Dr. Newsholme, Messrs. Yates, Ward, Wells, Jolliffe, D. T. Bostel, E. Roberts, D. B. Bostel, Richardson, Lintott, and Harmer. The rules of the Glasgow District were adopted, and the offer of Mr. Councillor Leader for the use of his offices for the company was accepted with thanks. The Secretary was authorised to call the Registration Committee on the 7th of September to consider applications. It was decided to hold public meetings at Lewes, Chichester, Hastings, Eastbourne, Horsham, East Grinstead, Tunbridge Wells, Worthing, and other towns, if invited. After the regular business, some of the members expressed dissatisfaction with the way gasfitters were allowed to operate on water-pipes, and it was thought that the Waterworks Committee of the Brighton Corporation should only allow registered plumbers to tamper with their service, as was the case with the New River and other water companies.

**The English Iron Trade.**—The English iron market continues strong and active, the tendency of prices being still upwards. Pig-iron especially is gaining in strength. At Glasgow warrants have been an animated business, and have gone up accordingly, whilst prices quoted by Scotch makers for their iron are from 6d. to 1s. a ton higher. Middle-brough pig has risen 9d. on the week. Bessemer iron is 6d. a ton dearer. Elsewhere pig-iron is stiffening in an equal degree. The position of manufactured iron cannot be better described than by stating that the market continues strong and the demand good. Ship-plates and bars are quoted 2s. 6d. a ton higher, the higher price being obtained without much difficulty. Tin-plates are firm in price, and there is good business. Steel shipbuilding material and engineers' requirements are maintaining the recent advances; but the market is somewhat weaker for rails, blooms, and slabs, and the higher price quoted last week for rails cannot be maintained. It goes without saying that shipbuilders are pushing on work with all speed, fresh orders coming in very regularly. The condition of the engineering trades continues satisfactory.—*Iron.*

**Wesleyan Chapel, Harrogate.**—The memorial stones of a new Wesleyan chapel and school were laid at Starbeck, Harrogate, on the 13th ult. The walls are of blue flag-stone, with yellow sand-stone dressings and slated roof. The chapel gives accommodation for 200 persons, and the school for 70 children, at a cost of 8501. Mr. J. Sadler, of Starbeck, is the builder, and Mr. T. Butler Wilson, of Leeds, is the architect.

**Building Land in the Isle of Wight.**—Last week a numerous company was attracted to Sandown, in the Isle of Wight, the occasion being a sale of building land possessing a special interest, by Messrs. Baker & Sons. A train was dispatched from Waterloo to Portsmouth in connexion with the sale, conveying between 500 and 600 persons, a steamer from Portsmouth Harbour taking the company to Ryde, whence they proceeded by the Isle of Wight Railway to Sandown. It appears that during the last thirty years the resident population of Sandown has increased more than fourfold, and at the present time a large number of houses are in course of erection. The property offered at last week's sale is known as the "Louisville Estate." The plots offered were ninety-nine in number, and, on the sale commencing, they were all sold in an unusually short space of time. The plots varied in their size from 25 ft. to 60 ft. frontage, the prices obtained ranging from 151. to 451. each. A corner hotel plot, having a frontage of 50 ft. to the Marine-parade, and a return frontage of 125 ft. to Osborne-avenue, was sold for 1321. The proceeds of the sale amounted to upwards of 2,0001. Several important improvements are about to be carried out by the Local Board, including the extension of the present esplanade; whilst a newly-promoted company propose to extend the pier to four times its present length, which will enable steamers to run direct and land passengers at Sandown from Portsmouth, Gosport, and Southampton.

**Native Art Industries in Japan.**—The native art industries of Japan, says the German consul at Tokio, are being greatly developed of late. Thus, for instance, a company has just been formed at Kioto, with a capital of 35,0001., for the establishment of a porcelain and pottery manufactory. The manager chosen is a German, and the machinery required in the manufacture has been ordered from Germany. As the Japanese are, as is well-known, very skilled in this industry, the enterprise is sure to be a success. A large glass factory has also recently been started at Osaka, with a capital of 35,0001., and, as hitherto all the glass used in Japan has been imported, chiefly from England, this undertaking will, no doubt, prove equally successful. In 1886, the imports of window-glass alone amounted to 86,482 cases, valued at 40,0001., besides other articles valued at 7,5001. A big trade in window-panes is particularly expected, as their advantages over the old-fashioned "shoji," or open shutters of laths and paper, are fully appreciated by the modern Japanese. The glass company has dispatched its chief engineer to Scotland for one year, for the purpose of learning the Scotch method of glass-blowing and ordering the requisite machinery. A third company has been formed for manufacturing bricks and tiles by the cylindrical furnaces in use in Europe, and for this undertaking the necessary machinery has been ordered at Magdeburg. There are to be three large furnaces, capable of producing sixteen million bricks and tiles a year. Finally, a paper-mill, with a capital of 35,0001., has been opened at Fujikawa, capable of turning out four tons of printing and seven tons of other kinds of paper a day, articles for which the demand is steadily increasing.

**Sewerage Competition: Macclesfield.**—The Macclesfield Local Board lately advertised an open competition to civil engineers for the best scheme for the interception of the sewage now flowing into the River Bollin, and its purification by the best known method. We learn that Mr. W. H. Radford, Assoc. M.Inst.C.E. of Nottingham, is the successful competitor. His scheme is to lay six miles of intercepting and outfall sewers to collect the sewage now flowing into the river, and convey it to an outfall below Prestbury. He then proposes to purify the sewage by irrigation on 159 acres of suitable land, specially laid out and drained for the purpose. The manufacturing refuse, consisting chiefly of soapuds and dye-water, is also proposed to be dealt with. The population is 39,000, and the estimated cost of works only, without land or easements, is 23,7501.

**Gilchrist Engineering Scholarship.**—An entrance scholarship will be offered at University College, London, in the present month. The value is 351. per annum, tenable during two years, and the competition is limited to those who have not previously been students of the College, and who will not complete their nineteenth year before October 1. A senior scholarship of 801. will be awarded at the close of the session. Further particulars may be had on application to the Secretary of University College.



LONDON.—For repairs and alterations to five houses and shops at Rotherhithe. Mr. Edward Clarke, architect, 13, Aldersgate Chambers, E.C. Quantities supplied.

|                                     |        |   |   |
|-------------------------------------|--------|---|---|
| G. Forster, Penge .....             | £1,070 | 0 | 0 |
| R. Martin, Peckham .....            | 1,054  | 0 | 0 |
| F. W. Jones, Peckham .....          | 1,037  | 0 | 0 |
| E. M. Priestley & Co.,* Camberwell. | 1,013  | 0 | 0 |

\* Accepted.

LONDON.—For the erection of two dwelling-houses and shops, Nos. 237 and 238, Upper-street, Islington, for Mr. Thomas Flowers. Mr. Charles R. Winter, architect. Quantities by Mr. H. Burton

|                    |            |
|--------------------|------------|
| J. Grover & Son    | £3,950 0 0 |
| Hunt               | 3,880 0 0  |
| Smith              | 3,825 0 0  |
| J. Jarvis          | 3,900 0 0  |
| E. Lawrence & Sons | 3,740 0 0  |
| J. H. Mollett      | 3,674 0 0  |
| J. Anley           | 3,670 0 0  |
| C. Deering & Son   | 3,593 0 0  |
| W. Shurmer         | 3,583 0 0  |
| Thompson           | 3,664 0 0  |
| Jackson & Todd     | 3,494 0 0  |

LONDON.—For taking down and re-building two houses, shops, and scene factory, adjoining the Grand Theatre, Islington, for Mr. C. Wilmott. Mr. C. Bell, architect—

|               |            |
|---------------|------------|
| Payne         | £3,600 0 0 |
| Bywater       | 3,446 0 0  |
| Green & Lee   | 3,433 0 0  |
| Anley         | 3,256 0 0  |
| Allen         | 3,087 0 0  |
| Sharp         | 2,976 0 0  |
| Deering & Son | 2,970 0 0  |
| Veale         | 2,940 0 0  |
| Kellaway      | 2,895 0 0  |

LONDON.—For rebuilding shop and premises in High-street, Islington, for Mrs. Bland. Mr. C. Bell, architect—

|               |            |
|---------------|------------|
| Payne Bros.   | £1,990 0 0 |
| Bywater       | 1,877 0 0  |
| Green & Lee   | 1,806 0 0  |
| Anley         | 1,761 0 0  |
| Sharp         | 1,740 0 0  |
| Allen         | 1,735 0 0  |
| Deering & Son | 1,690 0 0  |
| Veale         | 1,674 0 0  |
| Kellaway      | 1,543 0 0  |

LONDON.—For paving works at the Kiosk, Shoreditch. Mr. C. M. Shiner, architect—

|                 |          |
|-----------------|----------|
| Novell & Robson | £103 0 0 |
| Adams           | 60 0 0   |

LONDON.—For the erection of the "George" public house, Great St. Andrew-street, W.C. Mr. Walter Stair, architect, 9, Queen Victoria-street, E.C.—

|                    |            |
|--------------------|------------|
| Grover             | £2,430 0 0 |
| Horsley (accepted) | 2,180 0 0  |

LONDON.—For alterations and repairs at the German Young Men's Christian Association, 8 & 25, Finsbury Square. Messrs. Tolley & Son, architects—

|                       |            |
|-----------------------|------------|
| Turner                | £1,245 0 0 |
| Talkner               | 1,150 0 0  |
| Smith & Bullock       | 1,110 0 0  |
| Marriage              | 1,025 0 0  |
| Waddington (accepted) | 938 0 0    |

LONDON.—For alterations and repairs to the "Kerish Drivers," High-street, Peckham, S.E. Mr. F. West, architect, Croydon—

|                             |          |
|-----------------------------|----------|
| Golden & Glasscock, Croydon | £243 0 0 |
| Richardson, Peckham         | 473 0 0  |
| Trowlock, Peckham           | 472 0 0  |
| T. W. Jones, Beckenham      | 439 0 0  |
| W. Smith, Camberwell        | 439 0 0  |

LONDON.—For alterations and additions at No. 8, The Terrace, Kensington Park. Mr. H. H. Hunt, architect—  
Priestley & Co., Camberwell. \* Accepted.

LONDON.—For alterations and additions to the "Lamb and Here," Lower Kensington-lane, for Mr. W. Freeman—  
Priestley & Co. (accepted). £100 0 0

NEWMARKET.—For erecting two houses at Newmarket, for Mrs. Bloss. Mr. John Flatman, architect, Newmarket—  
Simpson & Son ..... £1,600 0 0  
Linsell ..... 1,470 0 0  
Kerridge & Shaw, Cambridge \* Accepted. 1,437 0 0

NEWMARKET.—For erecting small house and shop at Newmarket, for Mr. J. Rogers. Mr. John Flatman, architect, Newmarket—

|                               |          |
|-------------------------------|----------|
| Fulmer                        | £439 0 0 |
| Smith                         | 380 0 0  |
| Artes                         | 363 0 0  |
| Simpson & Son                 | 350 0 0  |
| Kerridge & Shaw               | 312 0 0  |
| Linsell, Newmarket (accepted) | 297 0 0  |

SOUTHAMPTON.—For alterations and additions to "Basset Heath," Southampton, for Colonel Langmore. Mr. Rutland Saunders, architect, 6, Bishopsgate-street Without, E.C.—

|                   |          |
|-------------------|----------|
| Brinton & Bone    | £274 0 0 |
| Stevens & Son     | 548 0 0  |
| Franklin          | 510 0 0  |
| Barter (accepted) | 408 0 0  |

SOUTHAMPTON.—For the erection of residence at Basset, Southampton, for Mr. Morris Ashby. Mr. Rutland Saunders, architect, 6, Bishopsgate-street Without, E.C.—

|                          |            |
|--------------------------|------------|
| Jukes                    | £2,970 0 0 |
| Sanders                  | 2,770 0 0  |
| Sanders                  | 2,678 0 0  |
| Stevens & Son (accepted) | 2,473 0 0  |
| Cottage and Stabling     |            |
| Stevens & Son (accepted) | £266 0 0   |

*Lyra Tennis Courts, &c., West Kensington.*—Sir, In your issue of last week we notice (p. 148) that our tender for works at West Kensington for Mr. Alexander Payne is published as that of "Longmire & Burge." As there has been no such firm for some time past, may we ask you to correct this? The present style of our firm is "William Longmire & Co.," and the partners are, yours faithfully, E. & W. J. LONGMIRE, (34, Oldbury-street, Regent's Park, Aug. 29.)

*New Gospel Path Church, Ilkley.*—In reference to the list of tenders for this job, published in our issue of the 23rd ult. (p. 148), we are asked to say that, at present, no tender has been accepted.

#### TO CORRESPONDENTS.

J. B. (next week).—B. S. & B.—J. T. H.—H. M.—T. R. S.—W. G. L.—W. G. S.—W. C.—B. H. H.—J. B. F.—B. H. (too late for this week).—C. G. (we cannot advise; consult a solicitor and a surveyor). E. B. H. (such a statement is inadmissible except as an advertisement).—G. A. L. Co. (late).—A. H. (too late for this week).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline putting out books and giving addresses.

Notes.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications beyond news-items which have been duplicated for other journals, are NOT DESIRED.

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### Du Cerceau.

**T**HE latest of the series of special studies on architectural subjects to which Baron de Geymüller is devoting himself, and which will be among the most valuable contributions to architectural literature of this generation, is a volume on the life and works of Les Du Cerceau,\* as the author entitles his work,\* for it deals to some extent with the work of the son and other members of the family of Jacques Androuet du Cerceau, with whom personally, however, the book is mostly concerned—as, in fact, the reputation connected with the name is almost entirely due to him.

To most of us this reputation is rather a vague one, the name of Du Cerceau being kept before us mainly by the frequent references in works on architecture to his principal production, "Les plus excellents Bastiments de France" (we love to give the old spelling), as a valuable mine of information on the French château architecture of the sixteenth century. It is, in fact, this vague nature of the Du Cerceau reputation which has partly suggested the special study of the subject by the author of the work before us. He observes that, while the name of Du Cerceau has long been familiar to every one in connexion with French Renaissance architecture, while he is regarded as one of the most celebrated architects of the French Renaissance, and his statue shares with that of Jean Goujon the place of honour in the new Louvre, yet there is hardly any one in French artistic history about whom there is so little real knowledge and so much misapprehension. In a quotation from Berty's work, "Les Grands Architectes Français de la Renaissance" (1860), it is remarked that the name of Du Cerceau is mostly regarded merely as that of the author of "Les plus excellents Bastiments," and that he, who was born somewhere about 1515, is credited with having built the Pont Neuf, the Hôtel de Bellegarde, and even that of Bretonvilliers, which would have given him a life of

a century and a half's duration. On the other hand, Berty doubts whether Androuet du Cerceau was properly an architect at all; and another French critic, M. Destailleur, suggests that it was his books in illustration of architecture which procured for him the complimentary title of "Architecte du roi," and that we have no proof of any building having been actually constructed under the direction of Jacques Androuet du Cerceau. Baron de Geymüller thinks that, considering the terms in which Jacques Androuet is frequently referred to, we can hardly avoid the conclusion that he was a practical architect, and employed as such. Baptiste du Cerceau, for instance, is spoken of by a contemporary as a young man, "fils de Du Cerceau, bourgeois de Montargis, lequel a esté des plus grands architectes de nostre France," an expression which would hardly be applied to any one merely on the strength of some illustrative architectural publications, however able and valuable. Where, however, are the buildings erected by Du Cerceau? It is partly towards finding an answer to this question that Baron de Geymüller's study has been directed.

The author's conclusions, as in his previous works, are mostly based on documents and drawings hitherto unpublished, and among these were a set of architectural sketches in the Bibliothèque Royale at Munich, to which Baron de Geymüller's attention was drawn by a letter from the Munich Librarian in 1884, who wished to know if the French savant could throw any light on their authorship. These drawings consisted mainly of elevations of parts of buildings executed in Rome from the designs of Bramante, Raphael, and Sangallo. The character of much of the detail drawing in these sketches left no doubt in the mind of the author and of M. Destailleur that they were the work of Du Cerceau; a fact which, if accepted, would indicate that he had visited Italy for the serious study of Renaissance architecture in that country,—a course which would be likely to be pursued by a French architect of that day who was desirous to become a proficient in the designing of buildings in the new style in his own country. The probability that Du Cerceau went to Italy to study is in itself of some interest, as an additional instance of the influence of Italy on the architecture of the period in the rest of Europe: a subject in regard to which M. de Geymüller has some general remarks to make in his preface. (Glancing at the modern opinion, which he

refers to as prevalent in France, Belgium, and Holland, as to the injurious effect of the Renaissance on the spirit of modern architecture, and admitting that the architecture of France in the period before the Italian influence took possession of her was marked by a purer style, especially of detail, he adds that nevertheless "we are convinced that the introduction of the forms, and to some extent of the principles, of Italian art could alone have supplied the necessary elements for a new development in Gallo-Germanic countries;" that this introduction was in the main salutary and indispensable; and that in France, at least, it must have appealed to a hereditary Latin sentiment already existing. This argument, introduced by the author by way of justification of the part played by Du Cerceau in the architecture of his day, we may cite as another indication of that reinstatement of the Renaissance towards which English critics and architects have also shown such a tendency of late, and which, in fact, is only a natural reaction against the exaggerated disparagement of the Renaissance which has been prevalent among us during the last quarter of a century.

The other documents upon which Baron de Geymüller has founded his "Étude" are chiefly those in the possession of two architects, M. Destailleur and M. Lesoufché, and of an amateur collector, M. Foulc; who, among them, possess the most complete collection attainable of drawings and engravings by Du Cerceau. This name, as most of our readers are aware, is but an appendage to the real name of the architect, though it seems to have become practically adopted as a surname by his family. He was Jacques Androuet, "of the circle"—"surnommé du Cerceau, qui est à dire Cercle, lequel nom il a retenu pour avoir un cerceau pendu à sa maison, pour la remarquer, et y servir d'enseigne;" and in a list of the pensionnaires of Henri III., the names of himself and Baptiste, his son (probably), are given as "Jacques Androuet dict Cerceau," and "Baptiste Androuet dict Cerceau." The name, in fact, is like those characteristic epithets which, applied half playfully to many of the painters of the early Renaissance, clung to them and practically extinguished their true family names. The date of Androuet's birth, at Paris, the author is disposed to place a little earlier than the 1515 usually accepted; he would place it at not later than 1512, partly on the ground of the apparent date of some of the Italian

\* Les Du Cerceau; leur vie et leur œuvre. d'Après des Nouvelles Recherches, par le Baron Henry de Geymüller, Architecte, &c., &c. Paris: Jules Rouam; London: Gilbert Wood & Co. 1887.



sketches now attributed to Androuet du Cerceau.

Apart from the special evidence as to the probability of Du Cerceau having been actually the working architect, so to speak, for some special buildings, the author puts the question in his chapter vi. "Jacques Androuet du Cerceau était-il architecte?" in regard firstly to the large number of admitted and published designs by him, and the sketches for various designs, many of which are now published in this work for the first time. The "Plus Excellents Bastiments" we must pass by for the moment, because the question whether he was himself the designer of one or more of these is one of the points in debate. The most connected evidence of Du Cerceau's powers and tastes as an architectural designer, among his published works, is his book giving the plans and designs for "Cinquante Bastiments, tous differens," which is, in reality, a series of plans of ideal châteaux. These show a great variety of invention in regard to plan in one sense; that is to say, there are a number of schemes for palaces based on various symmetrical plans, and with designs erected on these plans, which exhibit a considerable amount of effectiveness in a formal and academical manner. We have a plan consisting of a quadrangle with angle pavilions projecting at an angle of 45°, with a colonnade round the courtyard; another with large square pavilions at the corners of a diamond-shaped court, the pavilions connected by narrow galleries; or we have a decagon courtyard with pavilions on five of its external sides, and narrow galleries connecting them. Baron de Geymüller gives two other still more odd examples of ideal châteaux of the same kind, one, a château consisting of a circular centre pavilion, with two galleries in concentric rings around it connected by bridges at the four points of the compass; another, a great courtyard, making a quatrefoil on plan, enclosed by four masses of building, each forming a half-circle, with oblong pavilions at their outer circumference, and round towers at the re-entering angles. These two are compared by our author with two rough sketches of designs for ideal towns, described as "Sketches by Fra Giocondo after an unknown Italian architect"; these are from M. Destailleur's collection, and each show the main idea of a circular centre temple, with streets radiating from it to the circumference of the walls. Both of these look very much as if they, or such other sketches from similar (Italian) sources, had not Du Cerceau's fancy in motion; and in one of them the outer wall shows round towers with small pavilions above, which have a remarkable resemblance to Du Cerceau's round towers in the "quatre-foi" ideal château above-named. These designs of Du Cerceau's show a considerable amount of fancy, and a power of laying out a plan effectively on a geometrical basis; but it may be doubted whether in themselves they could be accepted as proof that their author was a practical architect. Fanciful and varied as they are, they are mostly exceedingly unpractical; they are plans of which it would be difficult to make any convenient use, at all events at all comparable with the cost of building them. Baron de Geymüller seems to have misgivings of this kind himself, as he remarks that one must not suppose that Du Cerceau dreamed of executing these works, any more than Leonardo da Vinci thought of carrying out some of the singular combinations shown in his treatise on domes, "L'un et l'autre poursuivaient le même but, nettement défini; approfondir les lois de la composition et se rendre compte des éléments qui produisent le plus effect et de l'ordre dans lequel il faut les grouper pour atteindre ce résultat." We should have thought Da Vinci would have been just the man to have carried out his dome schemes in actual building if he could have got the chance; and Du Cerceau's preface to the "Cinquante Bastiments" is in quite a serious and business-like vein. The designs do exhibit a power of architectural grouping, but of a kind that would be more likely to occur to an architectural draughts-

man and book-maker than to one whose chief concern had been with actual buildings. Baron de Geymüller calls attention to another peculiarity in Du Cerceau's drawings which is more to the point. This is his habit of illustrating any one of the orders, not by a typical column and capital of the orthodox type, but by three variations of his own devising; often in bizarre and questionable taste, but still exhibiting originality and a habit of bringing his own thought to the consideration of classic forms of design, which is certainly characteristic of an architect and not of an amateur.

All this, however, still leaves one with the conviction that it would be more to the purpose of the argument to discover good evidence of Du Cerceau having been actually employed as architect upon some known buildings of importance; and to this part of the question Baron de Geymüller next addresses himself. One building, it appears, and one only, has been habitually and specially attributed to Du Cerceau by various writers at various times: the choir of the Church of the Madeleine, at Montargis. The author quotes on this head from the historian Guillaume Morin, who lived a generation or so after Du Cerceau:—"Du temps de Mme. d'Este, duchesse de Ferrare, les habitants et bourgeois de Montargis se cottisèrent pour faire bastir le chœur d'icelle (église) en la forme qu'il se void à présent. Le dessein en fut projeté par Du Sersau, l'un des plus ingénieux et excellens architectes de son temps. Le commencement fut sous le règne de Henry Second, et fut parachevé l'an 1608." This seems pretty clear, though according to M. Bert, the author before quoted, the result does little for Du Cerceau's fame, and he calls it a "triste edifice." Other critics, with whom Baron de Geymüller sides, consider it a building of a good deal of interest. The sketches which he gives, taken on the occasion of a visit to study this admitted work of Du Cerceau's, appear to us to confirm both criticisms. The building is "triste," but is at the same time original, and certainly the work of a man who had "notions" of his own, in which respect it tallies with the evidence of the "Cinquante Bastiments." It appears from the sketch to have been a late Gothic building, with an octagonal apse and end above, rising out of a square-ended ground story with the corners rounded off,—the line of the square termination being carried up above by flying buttresses at right angles to each other, abutting against an angle buttress decorated with Classical pilasters, and an urn in the place of a pinnacle; behind this arrangement the oblique face of the octagonal clearstory, with a large traceried window, is seen. The pilastered buttresses and urns, with quarter-circle flying buttresses, are continued in perspective along the aisle roof; the windows are all Gothic, the buttresses and pilasters all Classic. The effect of the whole is odd in the extreme, but it is a kind of thing no architect would pass without an inclination to sketch it, for its very peculiarity; and if, as appears, there is documentary evidence of the author of "Cinquante Bastiments" having had a hand in it, the building certainly bears out the documents. The near neighbourhood of Montargis to Orleans suggested to the author to prospect among the street buildings of the latter town for traces of the hand of Du Cerceau, and he gives a house-front which might very well have been by him; but it appears to be pure conjecture. For two other more important buildings, however, there seems to be something more than conjecture. These are the Châteaux of Verneuil and Charleval, both illustrated in the "Plus Excellents Bastiments," though without any claim being there made by Du Cerceau as to having designed or superintended them.

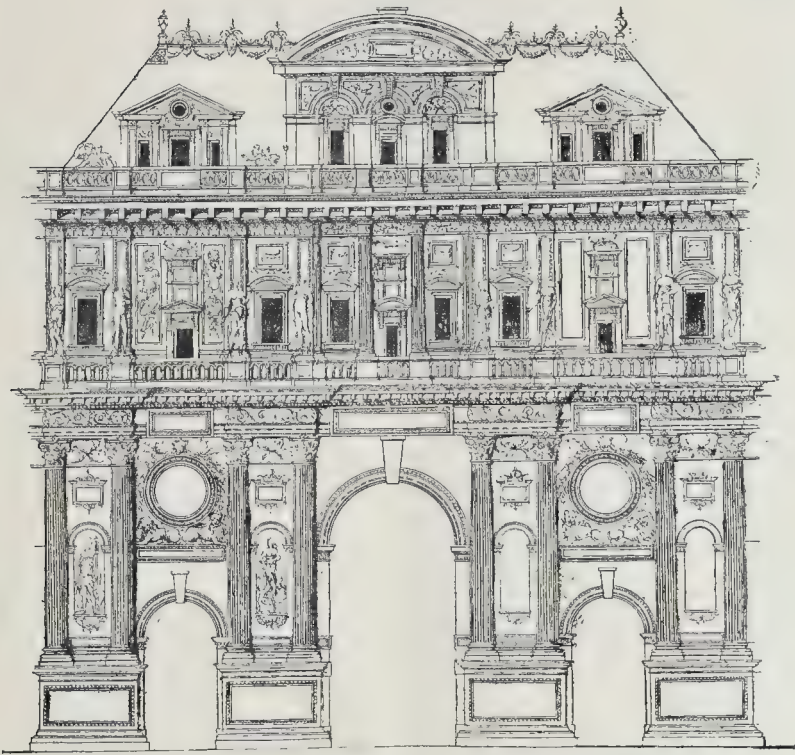
The evidence as given by Baron de Geymüller is curious and interesting, and the traces of it have been followed up and put together with much care. In the first place, we have to note that Du Cerceau gives to Verneuil ten plates and ten chapters in his work, which is more than he gives to the Royal Palaces of the Louvre and Madrid.

The drawings are executed with unusual care; in one elevation even the ornaments of a range of windows which are nearly hidden by a balustrade are carefully drawn as seen through the openings between the balusters; as if the author knew and valued every detail in the work. Yet Du Cerceau remarks on this that "le Desseing avoit été arrêté pour la face de la terrasse qui eust été devant le logis neuf"; so that this portion, thus carefully drawn, was never in execution: how did Du Cerceau come to illustrate it so lovingly if he were merely illustrating another architect's building? And is it not rather probable that he was putting on record, as completely as possible, what he had himself designed and never carried out? The style of Verneuil differs a good deal from that of most others of the "Plus Excellents Bastiments," and especially the design includes the same kind of fantastic seated figures, half human, half animal, with an odd kind of butterfly-looking wings, which form a favourite ornament in the acknowledged designs by Du Cerceau. The use, at Verneuil and Charleval, of rusticated masonry in great profusion, is also a characteristic of Du Cerceau's known designs. But there is further circumstantial evidence in regard to the architectural treatment of Verneuil in the history given of it by Du Cerceau himself. This history shows that when Du Cerceau published his very elaborate drawings of the château, it was not completed, nor even the exact manner of its completion determined on. Du Cerceau speaks clearly of two stages in the construction of the mansion, under two different proprietors. He speaks of the intentions of the first proprietor, M. Boulainvilliers, who commenced the mansion; then he mentions it passing into the hands of the Duc de Nemours, who did not find it entirely to his liking, and had made "au lieu de deux petits pavillons entarmes à chacune encoignure du bastiment par le dehors, un grand pavillon qui sont quatre pour tout l'edifice." The meaning of which latter expression seems rather obscure, but what follows is plain enough; "Mais pour plus esclater l'œuvre, son intention est de dresser sur le devant, vers le val, une salle de trente toises de long sur cinq de large, et une chambre à chaque costé, revenantes à la largeur de la salle, le tout couvert en terrasse," &c. It is here evident that the work was not finished, and that Du Cerceau was perfectly *au fait* as to what was going to be done; and M. Destailleur possesses a beautifully finished drawing by Du Cerceau showing the château with the front face lower than the other sides of the quadrangle (of this the author gives a small reproduction), and which differs in detail from the drawing given in the "Plus Excellents Bastiments"; and there is another sketch by Du Cerceau, which we reproduce here, as a "study for portion of a château," which is apparently a study for that same side of the quadrangle at Verneuil, "tout couvert en terrasse," and with the larger angle pavilions nearly similar to those shown in the illustrations of Verneuil. And to all this Baron de Geymüller adds the words used by Du Cerceau in regard to the Duc de Nemours, in the preface to the "Édifices Antiques Romains," in dedicating the book to his patron: "Aussi que de longtemps vous m'avez fait cet honneur que de m'accepter pour vostre et m'entretenir par vostre libéralité, qui me fait estimer vostre ce que je vous offre et présente, vous suppliant le recevoir de même oil et faveur qu'avez par cy devant fait quelques autres miennes petites inventions." The phrase "petites inventions" might indeed be taken to refer to his former drawings; but when we take the whole passage in conjunction with the facts before-mentioned as to the manner in which Verneuil was illustrated before its completion, and Du Cerceau's intimate knowledge of what was intended to be done, the consensus of evidence seems to establish, with at least the highest probability, that he was the Duc de Nemours' architect for the château, and did practise as an architect; the only matter for surprise being that he should have made no





Study for Portion of a Château.—By Du Cerceau.



Study for the Principal Entrance of the Louvre.—By Du Cerceau.

claim to his own work in his book illustrating the châteaux of France. Baron de Geymüller classes the great number of original drawings by Du Cerceau which are in existence under three periods; the first, as the drawings are illustrated in this book, showing a rather bald manner of outline drawing; the second, a much more finished and formal architectural manner, with a great deal more detail put in; the third, a more free and sketchy manner, with a greater liking for perspective drawing rather than elevation, and a certain amount of effect aimed at by shading in line in the shadowed parts. Both the drawings of which we give impressions (by permission of the author and publisher) belong to this second period; the project for an entry to the Louvre we give as one of the best and (we might add) most rational ex-

amples in the book, of Du Cerceau's method of dealing with Classic materials in a composition. For, in regard to a great many of Du Cerceau's designs, there can be no question that his taste in detail was often detestable; the drawings of what is called by the author his "third manner" are especially flagrant in this respect; they are covered with gimcracks, festoons twisting every way, immense consoles out of scale with the main design, &c. But with all this there is about his sketches a distinct force and originality of conception which places them, with all their offences against pure taste, quite out of the category of the commonplace. We have merely dealt with a portion of Baron de Geymüller's book, confining ourselves mainly to one special point which he desires to establish—that Du Cerceau was

really a practical architect and designer and superintendent of buildings, and not a mere illustrator; but we have done no more than hint at the amount of curious and interesting information to be found in the book, both in the text and in the numerous hitherto-unpublished drawings of the Renaissance period by Du Cerceau and others, of which fac-similes are given, and which throw such an interesting light on the spirit in which Classic forms of architecture were regarded and made use of, and on the characteristic methods of architectural drawing and representation among the Renaissance architects of the sixteenth century. The British Association commenced its annual meeting at Bath on Wednesday, when Sir Fredk. Bramwell delivered the opening address.



## NOTES.

**T**H has frequently been suggested that an immense saving would be effected in the working expenses of our railways by the adoption of the American bogie-truck system in the construction of goods wagons. Rather over two years ago we remarked upon this (see p. 364, March 6, 1886), Mr. Jefferts, C.E., having drawn attention to the question in a contemporary. We then observed that it was quite refreshing to have for consideration a practical proposition in the direction of reform, and it is now still more satisfactory to find that the reform itself seems to be commencing. The Midland Railway Company—who are always to the front—have some bogie-truck cars constructed, and last week several specimens of the new rolling-stock were on view at St. Pancras Goods Station. The coal truck is described as having a carrying capacity of 30 tons, and weighing only 10 tons, whereas the trucks used at the present time weigh 5 tons, and carry only 8 tons. It will be readily seen that there is an enormous difference in the proportion of dead weight to paying weight in the two types. The length of the new wagon is 33 ft., and it runs upon two bogie trucks of four wheels each,—the principle being similar to that of the newer types of long passenger carriages. The freight car, constructed on the same principle, only weighs 8 tons, and is capable of carrying 30 tons. A great point to be considered, besides the reduction in the dead weight, is the reduced amount of locomotive power necessary to haul vehicles of this description, as they are less rigid than our ordinary wagons, and traverse curves with less resistance. Mr. Roberts, of the Carriage and Wagon Department of the Midland Railway, has given a number of interesting comparisons between the two systems in the *Railway Herald*, the following being one of the most striking. The Midland Company owns 85,171 goods wagons, with a total carrying capacity of 681,368 tons. These wagons, if coupled up buffer to buffer, would make one single train 290 miles 626 yards in length. A train of American wagons, carrying the same quantity of goods, would only be 141 miles 1,672 yards long. Mr. Roberts sums up by advocating the renewal of all worn-out stock on the American principle, having come to the conclusion that such a course would be productive of great economy.

**A** CURIOUS use of the word "pediment" appears in Carlyle's "Past and Present," chap. xvi. He is usually very happy in his etymologies—fantastic though they sometimes be—and a novel use of a familiar word by so great a word-master is worth attention. The shrine of St. Edmund, it appears, rested upon the High Altar, which was by the "careless candle of somnolent monks" destroyed, or, at any rate, damaged. The Abbot forthwith re-edified it to serve as a "pediment" for the shrine. Carlyle evidently had *pes, pedis* in mind. Skeat is a little troubled about the etymology of this word, and although he gives as its meaning, "an ornament finishing the front of a building," deduces it from the Latin *pedamentum*, a stake or prop with which vines are supported. If this be the true root, a pediment is not the "triangular thing" of Mr. Ruskin's (another great word-master's) scorn; but the row of supporting columns. Pediments over windows, doors, &c., as usually understood, are mis-called, and we want a word for a Classic gable of low pitch.

**T**HE Trades' Union Congress, which is being held at Bradford this week, appears so far to strongly resemble the congresses of the last year or two in the infusion of a strong political element in the discussions which have taken place. Mr. Shaftoe, the President, after glancing at recent disclosures which have been made as to what is called the "sweating system," said that something

like a general agreement had been arrived at to the effect that the sixty-ninth clause of the Factory Act should be repealed, "thus enabling factory inspectors to enter private houses, bedrooms, or any place where goods were believed to be in course of manufacture." He thought that this would "enormously check" the sweating system. He took up and warmly advocated a suggestion which he said had lately been thrown out by our contemporary, the *Lancet*, to the effect that municipalities should erect special workshops for such trades as are affected by the sweating system, whereby proper light, ventilation, and sanitary accommodation could be secured. Such workshops, he argued, could be let at a fair rent, and their establishment would entail no pecuniary loss. Of course we are quite in sympathy with this suggestion, on sanitary grounds, but its practical adoption by public bodies must be preceded by very careful consideration, for reasons which are so obvious that we need not state them here.

**MR. EDWIN CHADWICK'S** address to the Brighton meeting of the Association of Public Sanitary Inspectors, of which mention was made in our last, did not contain much that is new to those who are familiar with his speeches and writings. Referring to the high rate of mortality in Manchester, he applied his old thesis to the cotton metropolis by saying that "a contractor, with enlarged and commensurate powers, might contract for the reduction of the excessive death-rate of Manchester,—now 27—10 to 16 per thousand." And this reduction, he averred, would be attended, as at Leek, "with an augmentation of five years of the average duration of life and working ability." Of the chief aspects of the new Local Government Act Mr. Chadwick promises to speak on a future occasion. But he briefly adverted to some of the most hopeful of the chief provisions of the new Act. We quote one passage:—

"The enlargement promised of many of the areas of local administration, with some securities for sanitary qualification, offers new opportunities which may conduce to improve local organisations. If due exertions be made to inform the electors of the paramount interests in our work, they may be led to make a new and clear start, rejecting the sordid owners of bad tenements; those who go in solely for contracts among persons whose interests are adverse to a correct administration; and those who continue the enormous wastefulness of ignorance. If it be duly impressed on the wage classes that a large proportion of the £24,000,000 which they pay annually for insurance charges against excessive sickness and mortality may be saved by the efficient administration of sanitary science, we may expect larger additions to our demonstrations of the power of those classes. But it must be admitted that, despite the flagrant examples of the working of vestigialism, in the hurry of legislation large opportunities have been left for its continuance of the error. Before the close of the session, however, opportunities may be afforded for correction; that is, if the promises made of a due recognition of our science, and of the position due to them, be not longer withheld."

We are afraid that Mr. Chadwick is a little too sanguine in anticipating that much more will be done this session in the way of sanitary legislation.

**T**HERE are no places more liable to outbreaks of diseases arising from insufficient and imperfect sanitary arrangements than new watering-places. Nowhere has the increase in houses for summer visitors at the sea-side been more rapid in the last few years than in the Isle of Man. Houses have multiplied quickly, not only in Douglas, which is now largely a town of lodging-houses, but also in Ramsey, Port Erin, and Port St. Mary. In the last-named place we are informed that diphtheria has broken out through defective sanitary arrangements. It is not in the least astonishing that in these new watering-places in the Isle of Man and elsewhere such diseases should arise. In the first place, persons who build the houses are frequently quite ignorant of ordinary sanitary arrangements, or are careless about them; and in the next, as many of these seaside

lodging-houses are practically unused for three-fourths of the year, they are more apt than others to become insanitary through disuse; moreover, the lower class of visitors are not those who are careful about sanitary matters. As the Isle of Man swarms in the summer with visitors from the factories and the counting-houses of Lancashire and Yorkshire, it is most necessary that the authorities in that healthy island should take careful precautions not to allow a place unsurpassed for its pure air and fine sea to be spoiled by hasty and careless building.

**S**OME further alterations are in course of being carried out at the north-western corner of St. Paul's Churchyard. The demolition extends to the St. Paul's Hotel (late Watson's), which covers the western entrance here into London House-yard; No. 78, Todd & Procter's; and No. 79, Verinder's, the long familiar cutlery shop, which latter was established in the year 1766.

**B**Y direction of Sir Wyndham Knatchbull Bart., some properties and rich grazing lands in East Kent will be offered for sale by auction on the 25th instant, at Ashford. The pastures, lying in the Romney and Walland Marshes, cover 1,074 acres in all, situated in the parishes of Brookland, Iychurch, Midley, and Bilsington. The other properties, to the extent of 1,150 acres, are portions of the outlying Mersham Hatch estate, round about Sevington, Willesborough, and Summer Hill to the south-east of Ashford, by the main road to Hythe and Folkestone. The Knatchbulls have owned the manor of Mersham-le-Hatch since 2nd Henry II., when Richard Knatchbull bought it of the executors of one Edwards. In the ancient church of St. John-the-Baptist are preserved several memorials of his house. These comprise brasses of 1582 and 1584, the monument to Sir Norton Knatchbull, who was created baronet on August 4, 1641, and represented the county in parliament; he died 1684. Also of his eldest son, Sir John (1696) Sir Norton (1636), sheriff of the county in 5th James I., and Bridget (1625), one of his three wives. The church was restored in 1877 by Sir Wyndham and the Rev. R. B. Knatchbull-Hugessen, vicar.

**T**HE Earl of Crawford and Balcarres has made the munificent gift to the nation of the equipment of his observatory at Dun Echt, to be placed in the Royal Observatory at Edinburgh, on condition that the administration of that establishment is carried on, as heretofore, by the Crown. Professor Piazzi Smyth, who recently retired from office, has from time to time complained of the inadequacy of the present observatory on the Calton Hill. We understand that Government contemplate the erection of a new observatory, and that investigation is being made as to a suitable site for the new building.

**T**HE last number of the *Journal of Hellenic Studies* (IX., No. 1) is the first to appear in the newly-projected form. The size of the text is considerably increased, and the plates are to be henceforth included; the inconvenience of a separate atlas is thus avoided. The supplementary notices on the progress of archaeology in Greece, and on important archaeological works, are to appear from time to time; the proposed *résumé* of archaeological periodicals has to be given up for lack of space. This is no serious loss, as the work is well and succinctly done for English readers by the *Classical Review*, which is in the hands of every archaeologist. The new number opens with a paper by Mr. Cecil Smith on "Two Vase Pictures with Sacrifices," the interest of which extends so far beyond the immediate subject that it must be briefly noticed. The two pictures have been ingeniously pieced together by Mr. Smith from fragments which came to the British Museum so long ago as 1846 and 1864 respectively. The first picture represents a sacrifice on the Acropolis, to Athens, present in person. Close to the altar is the sacred olive-tree hung with small terra-



ta tablets. On the other side is a column mounted by a votive figure, just such a monument, in fact, as is represented by the cribed shafts which have been recently and in such numbers in the Acropolis. The chief interest centres, however, in the figure of the goddess herself, which Mr. Smith has been able to put together simply by observing the potter's wheel-marks on the reverse side. The design is evidently inspired by the Pnyselephantine Parthenon, though it is no vile copy. The helmet is surmounted by a sphinx, and rows of protomoi (busts of imals) fringe the forehead, just as in the hermitage medallion. Most curious of all, the vase the cheek-piece of the helmet is not decorated, but in the original sketches traced upon it, the lines resemble the typhon chased on the medallion. The artist obviously changed his mind, and suppressed in detail as excessive or inappropriate. Last, it is not least, one of the fragments bears upon the troublesome inscription *Φιδίας*, which as usually taken as a careless form of *Φειδίας*. In the fragment he has joined, Mr. Smith notes a single *ν*, just at the right distance to give us *εφιδίας*. So here we have not only a new reminiscence of the Parthenon Pheidias, but also a new vase-painter's signature. There could scarcely be a finer instance of the possibility of new light from d lamps.

WITH the second set of fragments Mr. Smith links a conjecture of some interest, and which seems to throw some new light on the Parthenon marbles. In the fragment he discusses is a woman figure seated on a horse, which, on the comparison with other designs, undoubtedly the moon goddess, Selene. This brings us to the east pediment of the Parthenon. Every commentator on this ediment has said that Selene driving her *er* or *chariot* is sinking below the horizon. In a drawing, adapted from a vase, Mr. Smith shows, we think, beyond dispute that he is not driving a chariot at all, but simply riding on a horse. This is far more consonant with artistic tradition; moreover, the folds of raphery on the remaining torso show clearly that the goddess was seated sideways, riding in Roman fashion, not driving. We cannot even summarise all Mr. Smith's arguments,—indeed, this is the drawing he gives that brings the chief conclusion,—but we cannot refrain from pointing the moral, perhaps nowadays scarcely needed, that a knowledge of vase-paintings is a thing not only pleasant in itself, but also a thing essential for the thoroughly-furnished archaeologist.

NOTHING could be much more amusing, or more characteristic of the want of principle with which English daily papers deal with architectural subjects, than the leading article of the *Times* on Wednesday against the normities of restoration and restorers. Some correspondence of a very gushing description, and, we suspect, very highly-coloured, concerning some destructive restoration work at a little church at Cossey (we believe Costessy is the real name), near Norwich, furnishes, we presume, a hint for a leading article at a time when subjects for such articles are scarce, and so the *Times* waxes suddenly architecturally and archaeologically virtuous, and rebukes the offenders in the name of the Society for the Protection of Ancient Buildings. It signifies nothing to the *Times*, of course, that similar work has for years been carried on by an incompetent amateur architect at St. Alban's Abbey, one of the greatest and most interesting of English ecclesiastical buildings, both historically and architecturally; that the aforesaid amateur botcher has had the free use of the *Times* columns to vilify any one who ventured to complain of his proceedings; and that the *Times* has never uttered one word in defence of St. Alban's!

**Porous Glass.**—A Paris firm of glass-makers, Messrs. Apert Frères, has, says a French technical journal, produced some porous glass, to be used for window-panes. The pores are too fine to permit of draught, but cause a pleasant and healthy ventilation in a room.

# NORWICH CASTLE AND A PUBLIC MUSEUM.

FOLLOWING an example set to them at Nottingham, the Norwich Corporation have acquired the Castle, and will devote a sum of about 11,000*l.* (whereof the greater part is already subscribed) to converting it from a prison into a civic museum and art gallery. Norwich Castle had its origin in a fort, within three concentric ramparts, which Uffa, first King of the East Angles, established circa 575 at North-wic—that is to say, a northern outpost of the Roman military station of Caistor, or *Venta Icenorum*, by the Tese, distant four miles southwards. Subsequently the chief seat of Anna, it was overthrown by the Danes, but rebuilt, it is said, by Knut, who had a palace at Blickling, in the same county. In his account of the fabric (*Archæologia* for 1796, vol. xii., pp. 132-180), William Wilkins observes that "although the building is of Danish workmanship, it is notwithstanding in the taste of architecture practised by the Saxons long before England became subject to the Danes, and it is the best exterior specimen of this kind of architecture extant." The outermost vallum, which may be traced near to St. Andrew's steps and Cornford-street, encompassed an *enceinte* of 23 acres. Next lay the outer ballium and the middle vallum, which have been identified in London and Bulcock lanes. In the central Castle-hill, of 63 acres, and 360 yards in circuit at the summit, stands the Keep. Its dimensions are 92 ft. 10 in. north to south; 110½ ft. east to west; and 69 ft. 6 in. to top of the merlons of the battlements. From the eastern side projects the Bigod Tower, as restored in 1824. It was formerly approached by an outside staircase and drawbridge. The tower is believed to have been built temp. William II., and to have been repaired or completed by Hugh Bigod, who was constable in succession to his brother William in the early part of the 12th century. To Bigod, indeed, the rebuilding of the entire fortress has been attributed. The three stories above the basement are faced with arcades of rounded arches ranged between the slip buttresses, which constitute a striking and notable feature of the four elevations. An ancient bridge, rising some 15 ft., crosses the innermost foss. It has a remarkable arch, semi-circular, and of 40 ft. span. The bridge was formerly flanked, at the inner end, by two towers, circular on plan, and of 14 ft. diameter. The interior of the Castle has suffered many and extensive alterations. The shell has served as a prison from a time far remote; as long ago, we read, as the end of the thirteenth century (1293), when Roger Bigod, as Earl of Norfolk, was constable. By an Act of Parliament passed in 1806 the "Castle precinct" was vested, in trust for the county, in the county justices, with power given to them "to build, repair, or alter anything belonging to it as they may think proper." So, in 1824-8, and at a cost of 50,000*l.*, a new county gaol was constructed along and in concealment of the Castle's eastern front, on the site of a prison which had been erected there in 1793, at a cost of 15,000*l.* This outlay had been preceded in 1822-3 by the building of a new county hall and courts on the north-eastern side of the vallum. William Wilkins furnished the designs, after the Tudor style. The original hall, of 1578, on that same site, was burnt; and its successor, of 1749, was demolished. From the year 1597 the city gaol was within the Guildhall until the building of a new City Gaol and House of Correction, without the walls and near to St. Giles's Gate. This was done in 1824-7, at a charge of 30,000*l.*, from the designs of Philip Barnes.

The following couplet was once popular in this district:—

"Caistor was a city when Norwich was none,  
And Norwich was built with Caistor stone."

Tradition runs that when Uffa settled himself at Norwich—and which in Elfred's time formed Guthrum's capital—most of the inhabitants of Caistor sought harbourage around the new citadel. Their first bishop was Felix, of Burgundy, circa 680; about forty years later the see of East Anglia was divided into two bishoprics; Elmham, in Norfolk, and Dunwich, in Suffolk. They remained vacant for a hundred years after the harrying incursions by the Danes. Dunwich was then merged in Elmham. Next Arfastus changed the seat to Thetford. From the last-named place it was transferred to Norwich, in the year 1094, by Hubert de Losinga. There, in 1096, he built him a palace,

and founded a cathedral in honour of the Holy Trinity.

An account of Nottingham Castle (garrisoned in 1643 by Colonel Hutchinson), as lately formed into the Midland Counties Museum in connexion with South Kensington, will be found in our report of July 30, 1887, of a meeting of the Architectural and Archaeological Society of the counties of Lincoln and Nottingham.

# THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT GLASGOW.

CONTINUING our special account\* of the Glasgow Congress of the British Archaeological Association, we come to Wednesday, Aug. 29, when, notwithstanding the lowering aspect of the clouds, a goodly number of the visitors and their friends took train at the Buchanan-street Station for Larbert, where carriages were to have met them. A violent shower prevented their arrival for some time, and the archaeologists were not a little pleased to take what shelter the moderate-sized station could afford. The weather, however, soon cleared, and progress was made to Torwood-head Castle, a Scottish mansion now entirely in ruins, although the masonry is, in parts, strong and solid. The building is of late date, presenting features more of an ordinary manor-house than those of a castle. It enclosed two sides of a courtyard, but the wall of the latter is now levelled. The windows are square, and larger in size than is ordinarily the case in Scottish fortified buildings. After a short inspection under the guidance of Mr. Dalrymple Duncan, F.S.A.Scot., the party proceeded through the adjacent woods to the elevated ground on which stands a monument of antiquity of the greatest possible interest to the visitors, since it is the only example of a class of monuments peculiar to Scotland included in the present year's programme. We refer to the prehistoric Broch at Tapok. It stands on the highest point of the hill, commanding a magnificent panorama of the adjacent country, over the field of Bannockburn, and far away to the left of Stirling. Here Mr. Dalrymple Duncan read a paper descriptive of the structure, as follows:—

## The Broch at Tapok.

Among the various relics of the past which time has spared, the Scottish brochs possess a special interest, both because they are a type of building absolutely peculiar to the country, and from the fact that they show the prehistoric artists who constructed them to have possessed alike forethought and resource in working out the idea of an edifice so admirably suited to fulfil the object for which it was intended. A broch may shortly be defined as a hollow, circular tower of dry-built masonry, from 40 to 70 ft. in total diameter, having within the thickness of its wall a series of chambers and galleries, lighted by windows all looking into the central area. The only aperture to the outside is a doorway through a tunnel-like square-headed passage 5 to 6 ft. high, and about 3 ft. wide, constructed in the thickness of the wall. The latter is solid for about 10 ft. from the ground, and is carried up with a clear space of about 30 ft. wide between the exterior and interior portion. Into this hollow, however, horizontal ranges of slabs are inserted at intervals of 5 ft. or 6 ft., thus forming galleries about 6 ft. high and 3 ft. wide, which run completely round the tower. These galleries are connected by a stair which runs up to the top of the tower, and are lighted by windows in the inner wall of peculiar construction, and placed vertically over each other. The central area is from 20 ft. to 45 ft. in diameter. The Broch of Musa, in Shetland, from being the best preserved, offers the most reliable basis for judging of the height to which brochs were built. This broch is 45 ft. high, though incomplete at the top, so that the others must occasionally, at any rate, have reached an altitude of 50 ft. The door of the Tapok Broch was placed about 4 ft. from the outer end of the tunnel-like passage referred to against a rebate in the masonry faced with strong slabs. It was secured by a bar fitting into holes made for the purpose in the side walls. In most cases there was also a guard chamber opening off the passage just behind the door. The object of the builders of the brochs was undoubtedly to provide a place of temporary shelter and defence, to which they could retire with their cattle and other valuables during the raids and

\* See *Builder*, p. 164, ante.



forays of foreign marauders, which, at the time of their construction, were constantly occurring in the north and west of Scotland. It is found, therefore, as should naturally be expected, that as a general rule these curious edifices are situated in districts of some fertility, and the buildings most admirably fulfilled the purpose for which they were intended. The height of the surrounding wall was an effectual protection against the feeble missiles in use at the period, while its thickness made it impervious to an attempt to dig through it. The door, again, being of stone, was proof against fire, and being placed 4 ft. within the entrance, could only be reached by one man at a time, whose movements would be impeded by the narrowness of the passage. Dr. Anderson, with reference to brochs, says "that the concentration of effort to the two main objects of space and complete security was never more strikingly exhibited, and no more admirable adaptation of material so simple and uncommon as unressed and uncemented stone for this double purpose has ever been discovered or suggested." But though primarily intended as mere temporary refuges, the brochs were not incapable of standing a siege of some duration. The brochs, as buildings, are unmistakably Celtic in their character, and are peculiar to Scotland. They do not bear any proper relationship to any variety of fortified edifice known in historic times. They have been compared to the round towers; but while in outward appearance there is a certain amount of similarity, and both buildings seem to have been intended for the same purpose, there are marked signal points of difference. The brochs are dry built, the round towers lime built. No hewn stone is used in the construction of the former, while it is often employed in the case of the latter. The brochs have chambers and stairs in the thickness of the walls, which the round towers have not. The windows of the round towers are in the external wall, and the doors at some height above the ground, while in the brochs the windows are in the inside wall and the doorway on a level with the ground. It is indubitable that the builders of the brochs were a people who had made considerable strides in civilisation, and even attained some measure of culture. The materials and instruments found in brochs indicate that the buildings were occupied subsequent to the Roman conquest of the South of Britain, and that the inhabitants had to some extent come within the influence of Roman civilisation. The examination of the brochs and their contents had revealed a very interesting phase of Iron Age culture, and it seems certain that there is no reason for ascribing a lower condition of civilisation to the occupants of these edifices than to the builders of the beehive huts and dry-built churches of early Christian times. The brochs are mostly found in the district of country lying to the north of the Caledonian Valley, and the isles around the northern and western coasts. Dr. Anderson some years ago made up a list of the brochs in the five northern counties, the figures in which are as follow:—In Shetland there are 75 brochs, in Orkney 70, in Caithness 79, in Sutherland 60, in Ross-shire 38, and in Inverness-shire 47, giving a total of 370. The state of matters south of the Caledonian Valley is very different. At present only three of these curious relics of the past are known to exist in that part of Scotland, partly, no doubt, in consequence of the large extent of cultivated land and the inevitable destruction which befalls such remains of pre-historic times in districts which are constantly turned up by the plough. The Broch of Tapoak is situated at the highest point of Torwood, and was first excavated in August, 1864, by Colonel Joseph Dundas, of Carronhall, who read an account of his discovery to the Scottish Society of Antiquaries in March, 1865. Its appearance previous to its excavation was that of a conical hill or mound, flat on the top. On the west side of the mound there is a precipitous crag of about 100 ft. in depth running north and south for about 800 yards. On the north-east and south sides the slope is gradual. At about 70 ft. from the centre of the mound there are the remains of a wall carried round until it reaches the precipice on each side. Beyond this there are the remains of a second wall. Both of the walls, on the earth being removed, were found to be built of large stones, roughly put together without cement. On the other side there are traces of a third wall extending along the face of the cliff, and filling up those places where the rock is not so abrupt as the

other parts. These outworks are not an isolated characteristic of the Torwood broch, as four of the Caithness and Orkney brochs are similarly protected. At the time of Colonel Dundas's excavations the mound was covered with heather and bracken, and overgrown by a clump of large fir trees. Operations were first commenced on the south side, and resulted in the discovery of the staircase, the doorway of which was completely blocked up with rubble. Work was then begun on the top of the mound, when, after the removal of an immense mass of large stones, rubble, and earth, which was thrown over on the east side to the amount of more than 200 tons, the structure was found to be a circular wall 15 ft. thick, enclosing an area of 35 ft. in diameter. At the height of 6 ft. from the floor the upper part of the wall is put back 18 in., thus forming a sort of shelf. The entrance doorway has two of the massive lintels still upon it. It is about 7 ft. high and 3 ft. wide at the door cheeks, behind which are the usual bar holes. The whole length of the passage is 18 ft. 6 in. To the left of the doorway is the staircase, as usual in the thickness of the wall. There are eleven steps, and the length of the passage leading into them is about 12 ft. The height of the wall remaining is not sufficient to show any trace of the galleries, but the presence of the stair implies their former existence. There are no chambers in the thickness of the wall on the ground floor, but all the other features of the building are those of the typical broch. A number of articles were found in the broch at the time of the excavations, and these were presented by Colonel Dundas to the Museum of the Society of Antiquaries in Edinburgh.

A vote of thanks to Mr. Duncan for his paper was proposed by Professor Hayter Lewis, F.S.A., who took occasion to refer to the admirable arrangements which had been made for the comfort of the members by Mr. Duncan and the local committee.

Descending through the tangled bracken and fern of the forest, the carriages were resumed, and a visit was paid to the site of the Battle of Bannockburn, the party alighting at the Bore Stone, now carefully covered over with iron gratings to preserve it from injury. It was here that the standard of Robert Bruce was erected on the ever-memorable 24th of June 1314. The grand view extending to the Links of Forth, Stirling Castle, high on its craggy site, backed up by the hills beyond it, was seen to great advantage in the sunlight which had succeeded the storm. The boggy ground around the little stream, the Bannock, which proved to be so fatal to the English, is now drained and turned to agricultural uses, while the village of Bannockburn and the adjacent one of St. Ninians, occupied by Prince Charles Edward in 1746, have grown almost one to another, and the modern houses extend nearly on to Stirling. Newhouse, where the Earl of Lennox, Regent of Scotland, was killed in 1571, is another village which has also undergone great increase in recent years.

On arrival at Stirling, Mr. W. B. Cook read a paper on the town and the Castle, of much research and of great historical value, but all too long for the time at the disposal of the party. Under his guidance the principal of the many old edifices of the town were examined, the Church of the Greyfriars being the first at which a halt was made. This church is still divided into two compartments, known as the East and West Churches, used by different congregations, the intended renovation of the fabric and the removal of the modern divisions being (unfortunately), for the time, abandoned. Stirling Church offers many objects of study, and it is essentially Scottish in all its features. It has a semi-octagonal apse; the windows are tall, and filled in with tracings that would, so far as their design goes, be considered of fourteenth century date were they met with across the Border; here they are of fifteenth century date. The apse is roofed externally with stone slabs, being first brought to a square above the parapets. The aisles are lofty, as is the whole of the choir, while the nave is of much less elevation. In the latter, solid Norman-like circular piers support pointed arches and a low clearstory, the aisles having traceried windows of large size. Their date corresponds with that of the circular piers, and is of the fifteenth century. The western tower is very characteristic of Scotland, and it is of late date, erected in stages, with some curious lines of continuous corbelling. Mar's Work, a ruin to the east of the church, erected out of fragments of Cambuskenneth Abbey, is a curious adaptation of some of the ornamental stonework of the church,

worked into the walls in odd fashion. Argyle's lodging is a very fine mansion of the seventeenth century, built by Sir Wm. Alexander, afterwards Earl of Stirling, but now used as a barracks. The time at the disposal of the party was not at all sufficient to do justice to the many buildings of interest which form Stirling Castle, and nothing more was done than for their principal features to be pointed out. The fine old Hall, the Parliament House, is now sadly disfigured by modern barbarisms, as is also the Chapel Royal, a late building, erected by James VI. in 1594, instead of a much more ancient fabric. It deserves a better fate than to have been turned, first into an armoury, and now, in fact, into a receptacle for stores. The Palace itself is sadly neglected and uncared for; many vulgar insertions have been made, the carved corbices cut through for windows, and no signs of care are visible from one end to another of this remarkable fabric. The grand view from the battlements was seen to great advantage. Ever and anon a blaze of sunlight, followed by flickering shadow, would chase one another over the lofty crags far off beyond the town, or a bright rainbow would appear through the dark clouds in the distance. The Tower of Cambuskenneth Abbey was seen in the meadows at the foot of Stirling Hill, but it was impossible to visit it.

At the evening meeting, the audience was divided into two sections, in separate rooms of the Corporation galleries. In the first, a paper was read by Archbishop Eyre on "The See of Glasgow," the chair being occupied by Mr. Thomas Blashill. The foundation of the See was traced from its early beginnings, and reference made to the Bishops and to the change when the See was made metropolitan. After a hearty vote of thanks had been accorded to His Grace, a paper was read by Mr. Allan Wynn, Chief Engraver of Her Majesty's Seals, on "The Great Seals of Scotland." At the other meeting, the chair was taken by Mr. W. H. Cope, F.S.A., and a paper was read by Professor Veitch on the subject of "Merlin and the Merlinian Poems." The references to Merlin in the dim histories of the remote period of British history in which he lived were carefully traced, and also their amplification in histories of later date. An animated discussion followed, and after a cordial vote of thanks to the Professor, a second paper was read. This was by Dr. Collingwood Bruce, F.S.A., on

#### *The Wall of Antoninus.*

Dr. Bruce said that before leaving the lowlands of Scotland, Agricola found it necessary to place in garrison some troops in his rear, to render all safe behind him. He could do so most economically by spreading his forts in the narrowest part of the country—namely, that which lies between the Firths of Clyde and Forth. For the same reason, Lellius Urbicus planted his wall there also. This latter general, the representative of the Emperor Antoninus, having dammed back the hostile waves of Caledonians in the year 140, thought it necessary to rear a continuous line of defence from the one coast to the other. This he did by the carrying of a wall from Carriden, on the Firth of Forth, to West Kilpatrick, on the river Clyde. The land between those two shores consisted of a wide valley, bounded on the north by the successive ranges of the Kilpatrick, Campsie, and Kilsyth Hills, and on the south by a continuous chain of gentle eminences, none of them rising to any great elevation. It was along the summits of the gentle southern heights that the Antoninus Wall was carried. The nature of the ground was just that which the Romans always, if in their power, selected for their entrenchments. They disliked the exposure of excessive elevations, and yet they wished at all times to be secure from sudden surprise—an advantage which a moderate elevation gave them. In travelling by the Edinburgh and Glasgow Railway, this arrangement would be noticed at several parts of the route. Antoninus' Wall differed from Hadrian's in having a rampart of earth under the stone; like Hadrian's, it had a deep fosse on its north side and a military way on the south. It was also provided with stationary camps for the residence of its defenders, and some minor structures resembling the mile castles of the southern wall. It strongly resembled in its general character the great German Wall, which still extends from the Danube to the Rhine, which was an earthen fortification. No masonry whatever was used in its construction. Unhappily for the purposes of the antiquary, Graham's Dyke lay in the district which is



versed by the lines of communication uniting eastern with the western seas and the two at metropolitan cities of Scotland—Edinburgh and Glasgow. The progress of improvement had done much to obliterate the lines of Julius Urbicus. The lecturer had been informed that when the traffic between Edinburgh and Glasgow was carried on by means of pack-horses, they travelled along the Roman military way of the wall. For fourteen centuries that *via militaris* served the necessities of the district. The same was the case with the Pictish Wall. Changes, however, had been made, and unfortunately the wall had suffered severely by them. It was now but the wreck of its former self. It was only here and there that it appeared in its native majesty. They did not know the name of any one of the camps, nor with what troops they were occupied. It from the altars and inscribed slabs which were found in the forts they learned that various tribes of Gauls, Germans, and other foreigners the Roman service were stationed along the Pictish wall, besides detachments of legionary troops.

A hearty and well-merited vote of thanks was tendered to Dr. Bruce for his paper, and the proceedings terminated at a late hour.

Thursday, August 30, was devoted to a visit to Rothesay, and, by invitation of the Marquis of Bute, the President, to Mount Stuart. The party embarked on board the fine steamer, the *Cumbe*, and on the way down the Clyde visited the lofty rock of Dumbarton, crowned with the ugly, barrack-like buildings of the present castle, which disfigure the site, and the castle of Newark, on the opposite bank of the river. This building is a fine example of a fifteenth-century dwelling-house, adorned with many signs of castellated style, for ornament more than defence. One of the towers of the castle is, however, a quadrangular keep of older building incorporated with the more modern structure. It is still perfect, and occupied by working men's families, the site being reserved for shipbuilding works close up to its walls. On arrival at Rothesay, the party proceeded to the Castle, which has recently been repaired to some extent by the Marquis of Bute, who has had the ditch cleared out and filled with water, many regular buildings removed to clear the beach, and the banks planted with trees. This celebrated ruin now stands out fully to view, and it is an object of much interest, but its position is low, and it is not therefore seen at any distance. The ancient timber drawbridge across the moat has been restored, under the direction of the late Mr. William Burges, and when the work was in progress the base of the ancient timber bridge was found. The Rev. J. King Wilson, F.S.A. Scot., conducted the party over the Castle, and described its history. It is circular in form, somewhat irregular, 135 ft. in diameter, the enclosing curtain-wall being 8 ft. thick and 20 ft. high. There are four circular towers at equal distances along the wall, and a central bastion between two of them, the square tower approach is erected. It is of later date, though it encloses the older entrance. The Castle dates from early times; Husbarch, King of the Sudreys, besieged it in 1046, killing the Steward of Scotland on the walls. It was again taken by an officer of King Haeco in 1265, partially destroyed in 1312, rebuilt in the time of Edward Balliol, improved by Robert II. and Robert III., occupied in 1504 by Oliver Cromwell's troops, and destroyed by the Duke of Argyll in 1685, since which time it has remained a ruin. Mr. Loftus Brock, F.S.A., described some of the architectural features of the fabric, which he said belonged to the oldest class of castles remaining in Scotland; he said that the masonry was covered with diagonal tool-marks, and, as at Bothwell, the towers were boldly projected beyond the curtain-wall, a feature which is found equally in all the other Scottish castles of the early part of the work here, namely, about the middle of the twelfth century. He then compared the fabric with other circular buildings in Cornwall and elsewhere, which are different in detail, and with French work; but the resemblance to the latter is no more than exists in English fortified works of the same date, both alike being some inspiration from Continental examples.

The ruined chancel of the parish Church of St. Mary, Rothesay, was then inspected. It is filled with tombs of good design and fairly good execution, now overgrown with weeds and creepers. On adjoining to the church beside

it, a plain, barn-like structure, Mr. Hewison gave an interesting description of the monuments, which are to the memory, according to some authors, of King Robert II. or Robert III., but one of them may be the tomb of Walter, the eighth hereditary Grand Steward of Scotland. The second effigy was believed to be that of Marjory, the daughter of Robert Bruce, and the third that of Angus, Lord of the Isles, who died in 1210. A Celtic cross, recently found, was also described, and allusion was made to two stones with interlaced patterns, now preserved in the Castle. Mr. John Honeyman made some remarks upon the architecture of the chancel, which is of the thirteenth century. Mr. Brook expressed regret that monumental works of so much beauty and interest should be allowed to rot away, and urged that some steps should be taken to preserve them from injury.

Carriages being resumed, the party, about 200 in number, proceeded along the seashore to Mount Stuart, the seat of the Marquis of Bute, who entertained them at luncheon in the beautiful hall of the mansion, a new building erected from the designs of Dr. Anderson. It is lined profusely with costly foreign marbles of great beauty.\* The party then drove to the south end of the Isle of Bute, passing the standing stones of Lubas, and making a halt at the ruined church of St. Blaine. It consists of a nave and chancel, the chancel arch being of Norman form, and the fabric being decorated with ornamented stringcourses and base-mouldings, the oldest portion being constructed with squared stones. The chancel is built of rubble, with two lancet windows at the east end. Here Mr. Arthur Cates pointed out that the rubble work was not of earlier date, as had been asserted locally, and showed that in many cases the older squared stones of Norman times had been reused when the extension was made. Mr. Hewison described the graveyards, which are on two levels, one having been used for males and the other for females, until the practice was stopped about 200 years ago by the Scottish Presbytery. The church has been disused for public worship for many years, owing to the migration of the population to other parts of the island. The party saw no signs of work of earlier date than Norman times; but close to the remains, on the north side, are traces of a remarkable circular structure, about 32 ft. wide, called the "Devil's Cauldron." Its thick walls are Cyclopean in construction, and it much resembles the Broch of Tapoak in appearance, but its uses for defence are doubtful, since it is partly built into the side of a hill, which entirely commands it. In connexion with this curious structure is a long length of Cyclopean walling, which leads up to it. The vitrified Fort of Dunagail, on a rock adjoining the seashore, was seen from some little distance. Returning through country of very great beauty to Kilmartin Bay, which had been passed *en route*, a special steamer conveyed the party to Wemyss Bay, whence Glasgow was reached by rail, a hearty vote of thanks to the Rev. Mr. Hewison having previously been given.

Friday, the 31st, was devoted first to a visit to Paisley Abbey, where the party was met by several of the inhabitants, including the Rev. Mr. Dalgetty, the Rev. Dr. Henderson, Dr. Richmond, Mr. Barbour, M.P., and others. After the members had assembled within the church, Mr. Loftus Brock gave a lecture upon the building. After having briefly traced its history, he proceeded to explain the appropriation of the various portions of the Abbey which remain, and referred to their evidences as to the dates of their erection. The earliest parts are the wall of the south aisle and its eastern return to the curious chapel dedicated to St. Murren, an early saint of the Celtic Church. This fragment of old wall proves that the chapel, which occupies an anomalous position south of the south transept, has always existed there since the foundation of the Abbey in the latter half of the twelfth century. Possibly an ancient church had occupied the site at an anterior date. There are evidences that early in the thirteenth century, when the present front was erected, preparation was made for two western towers, the lower stages of which remain, although the upper part of the front is of a date after the burning of the church by Edward I., the large gable window being still later. The nave assumed its present form in the middle of

\* It may be mentioned here that in the *Builder* for May 5 last we gave illustrations of a series of wall-paintings executed for the Marquis of Bute at Mount Stuart House by Mr. H. Walter Lindsay. These paintings, which form a frieze about 5 ft. deep in one of the large apartments, illustrate scenes in the life of St. Margaret, Queen of Scotland.

the fifteenth century, and it is mostly the work of Abbot Tarvas. The chancel, which is aisleless, and without any buttresses, the walls being reduced to about 10 ft. in height, was most probably erected by Abbot Shaw at the close of the fifteenth century. Judging from the thickness of the walls and the absence of buttresses, the chancel must have been aisleless, and probably agreed in height with the ruined transepts; it was without stone vaulting. Evidences showed that the nave also was timber-roofed. The central tower could have had no very great elevation, for what remains of two out of the four piers show that they were not capable of supporting any very excessive weight. What was erected even did not stand, and the fall of the tower caused violent dislocation of the masonry, visible at the present day. The stones have a large number of masons' marks, a critical analysis of which seems to bear out the dates given for the various parts, since, for instance, of those in the nave, hardly any occur in the chancel, where the greatest number of marks are still to be found. Mr. Ewan Christian pointed out in the chancel that a certain number of the stones bore marks of fire, showing that they probably belonged originally to the church burnt by the forces of Edward I. Great regret was expressed at the demolition of the cloister buildings only a few years ago. A subterranean passage, going south by west, discovered about fifteen years since, was then entered. It proved to be a work of some importance, the sides being formed of very neatly-squared stone, the Gothic arched roof having similar ribs about every 10 ft. apart. The passage, by the nature of its workmanship, appears to have been something more than a mere sewer, and, although it is on the side of the Abbey where the kitchen buildings would have been, yet it does not lead direct to the river. It was found at a point not far from the new Infirmary bridge, almost in the centre of the roadway, south of the site of the Chapter-house, and it extends somewhat parallel with the river.

Some of the party then proceeded to the Museum with Dr. Phené, F.S.A., to inspect some ancient British urns found by him on Cumbrae Island.

On returning to Glasgow, the large party was entertained at luncheon at the Exhibition, in the Royal Bungalow, after which the collection of antiquities of the Hunterian Museum, in the New Glasgow University adjoining, was inspected, under the guidance of Professor Young. The extensive and remarkable collection of coins and other antiquities was inspected and described, and at the appointed time an adjournment was made to the model of the Castle of the Bishops and Archbishops of Glasgow, which has been so admirably reproduced in the Exhibition grounds. Here the party was met by the Lord Provost, Sir James King, Sheriff Barry, Sir Wm. Collins, Mr. Kyle Guild, and many other members of the Reception Committee. After the Lord Provost had welcomed the Associates in the name of the Reception Committee, a private view of the remarkable and unique collection of Scottish antiquities which has been brought together within the walls took place. The pictures, the portraits of Mary, Queen of Scots, the relics of the Covenanters, and of the Pretenders to the throne, were all eagerly scanned, and not a little gratification was expressed at such a large and important series of articles being still in existence, mostly in private possession.

An evening meeting was held in the Corporation Galleries, the Marquis of Bute, President, occupying the chair. In his opening remarks, the Marquis referred to certain arrangements of the crypts of foreign churches, which agree with those of Glasgow Cathedral, and he referred to the ease with which additional and better accommodation for Presbyterian worship could be obtained by fitting up the nave, instead of the chancel, as is at present the case.

Mr. Thos. Morgan, F.S.A., read a series of notes on Ancient Scottish History, after which a paper was read by Professor T. Hayter Lewis, F.S.A., on

#### Masons' Marks.

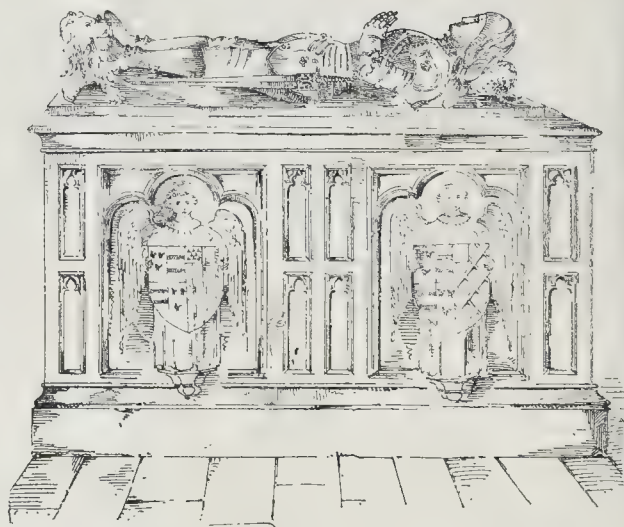
Professor Hayter Lewis said that Scotland possessed a larger number of such marks than could be shown down south. They were found out on the stonework of nearly every mediæval building of importance, and on very many buildings of greater antiquity. Such marks were now used as much as they ever were, but they were hidden. Proceeding, he said that



the first point was to ascertain whether they were hereditary, descending from father to son, with such slight alterations as might serve to distinguish them from each other. Certainly, in many cases it was not so. On the other hand, there were cases in which the same marks were used at the present day by members of distinctly the same family, there being some slight differences for the sake of identification. The next point was there any distinct mark which would serve to distinguish the members of any particular lodge or company? and he might say shortly that he could see no sign which would thus define a separate group of workmen—such a sign, for example, as that of the crown above the hammer, so well known on Scottish tombstones. Yet there were certain cases in which one would expect to find them if, as was generally supposed, the companies were under clerical guidance. The only method left by which one could trace the work and the progress of any particular lodge or fraternity from one building to another, or from one date to another, so as to ascertain the progress of an art by the consecutive history of two or more buildings, was by taking a group of separate but well-ascertained marks in one of them and tracing out the same marks, if possible, in another. All evidence seemed to point to there having been bands of skilled workmen attached to great monasteries, cathedrals, and, in later times, large cities, whose example and training influenced the districts around. When works of great magnitude were in hand, these bands were, no doubt, increased; and when the works ceased, they were lessened in number, the members dispersing here and there, and leaving their marks in various places, much as masons now did at the finish of some great work. But he found no distinct trace of the general employment of large migratory bands of masons going from place to place as a guild or brotherhood. As to whether they could find any distinct change between the marks of the twelfth and thirteenth centuries, when the great change took place in the tooling and the style generally, he felt bound to say that he could not see any distinct or general sign of change. Generally it was found that the same forms which were used in early times were continued in the later, though they were then made more ornate. Putting together the information which they had, they found that certain definite methods of marking the general surface of the stones characterised the masonry of the style which was called Norman; that in the thirteenth century there was introduced with the Early Pointed style an entirely different method of finishing the surface, and that the source of this method was apparent from the East; that masons' marks did not appear to have been commonly used in Europe until late in the twelfth century, and that some of the most prominent of those marks appeared to have been used continuously from very early times in Eastern countries.

The proceedings of the evening were brought to a close by a paper from Dr. Phené, F.S.A., on "Further Discoveries of Mounds in the Forms of Animals." Taking up the subject from a former paper descriptive of such mounds in North America, the lecturer passed in review a large number of similar formations in the shape of a serpent, the head being conspicuously marked, and there being certain furrows on the back containing charcoal, burnt bones, and other marks of the presence of man.

On Saturday, September 1, the day opened with gloomy rain-clouds, and many signs of unpleasant weather. A large party, however, eighty or ninety in number, proceeded, notwithstanding, to visit Doune Castle and Dunblane Cathedral. The first stopping-place was at the huge camp at Ardoch. On the arrival of the party, Professor Young led them into the largest of the formations, an earthwork more or less a parallelogram in form, the corners being rounded as is ordinarily the case in Roman forts; but the peculiarity in this case is that, instead of deep ditches, there are several smaller ones. The place must have been a perfect labyrinth when these were open to their full depth and crowned by palisades. There is a raised platform or pretorium in the centre. In addition to the main figure, long lines of earth-works, of no great height, extend in many directions, the whole area occupied being very extensive. The site is on somewhat low ground in relation to the surrounding country, it being about 15 ft. or 20 ft. above the little river at its base.



*Tomb of Thomas Chikayne (1488), Youlgreave Church.*

Through a family bereavement, it was impossible for the party to be entertained at Ardoch House by its owner, Mr. M. Bullock. A neighbour promptly and kindly promised to render this courtesy to the members, but a previous offer having been made and accepted, the party proceeded to Deanstoun, where, in a marquee erected in the grounds of Deanstoun House, the party was entertained at luncheon by Mr. and Mrs. John Muir. Thanks having been proposed by Mr. Thos. Blashill, and heartily rendered, Doune Castle was visited, and a paper descriptive of the ancient fabric was read by Mr. Dalrymple Duncan. The party saw the Castle in its greatly-improved condition, its owner, the Earl of Moray, who takes great interest in the old home of his ancestors, having been at great pains in arresting its decay. It is now roofed in, and a very conservative repair has taken place. The ancient arrangements are all but perfect, and the fabric can now be studied with great advantage. The Castle is of fifteenth-century date, and like many other buildings in Scotland, has never been completed. Its position is one of great beauty, and the lofty towers and walls make an admirable group, the picturesque effect being greatly enhanced by the waters of the swiftly-flowing river at the base.

Dunblane Cathedral was then visited. It consists of a lofty chancel, a long, roofless nave and side aisles, and a Romanesque tower on the south side of the aisle, a relic of an older church, which appears to have stood to the south of the present fabric, and on a slightly different axis. It projects into the south aisle. The Rev. A. Ritchie, M.A., having described the Cathedral, the Rev. Professor R. Storey, D.D., referred to the fact that the site was of interest to the student of Scottish history, as one of the settlements of the ancient Culdees, of the Celtic Church, and the continuity of the existence of buildings on the spot for many hundreds of years was of much interest. Dr. Rowand Anderson, architect, who is about to restore the nave, then described the intended works. No attempt will be made to renew the worn stonework, except where there is a structural defect, and the new roof will be of timber. The party listened to these explanations with considerable interest and satisfaction. The building has been roofless for a period long anterior to the Reformation, and it is good evidence of the solidity of the fabric and the goodness of the work that, notwithstanding the action of the elements for several hundreds of years, the stone is only a little weather-worn, and the walls are still solid. Two Celtic stones have recently been found—one a large standing stone worked with a tall Latin cross, of Irish type, on one side, and with figures and circles on the opposite one. The second stone has delicate interlaced work on the edge.

Owing to the length of the journey, no evening meeting had been arranged for.

We will conclude our account of the meeting next week.

#### SKETCHES ILLUSTRATIVE OF THE "A. A." EXCURSION.

We have already given a pretty full account of the Architectural Association's Excursion.\* We this week give ink-photo illustrations of Wollaton Hall and Youlgreave Church, as well as some illustrative sketches of other buildings visited by the excursionists.

It has often been said, and perhaps more often thought, that the Architectural Association Excursion is such a "dreadful rush" that there is barely time to see the buildings visited, much less to sketch them, and on these grounds alone some have been deterred from joining the party. There is, of course, some truth in the charge, and more particularly was it the case this year, when it was found absolutely necessary to leave out some of the subjects down in the programme on three days out of the five.

But if there are any who think there is little or no sketching done on the excursion, they would be agreeably surprised could they see the sketch-books after the final dinner on the Friday evening, when it is usual to exhibit them. If all these sketches and measured drawings could only be collected, arranged, and published together, there is no doubt they would form as varied and interesting a volume as any of the same class which have seen the light of late years.

The first day was not a productive one, from a purely sketching point of view; the subjects were too numerous, the distances between them, being great, took up a lot of time; but, worst of all, the weather was cold and wet, and had a very depressing effect upon the most enthusiastic. However, by the time Etwell (the last place on the day's programme) was reached, the rain had cleared off, and the cheering effect of a gleam of sunshine was at once seen, for there were more sketch-books out and pencils at work than had been the case during the whole of the preceding part of the day. The Gospel shelf on the north side of the chancel at Etwell is an unusual feature; but the almshouses on the north side of the churchyard received the greatest attention, and were sketched from several points of view. The central feature on the inner side, with its enriched pediment and inscription, is given in a general sketch.

Tuesday was just as fine as Monday had been wet, and no time was lost as the buildings were reached in transmitting some of the more striking features to paper. Wingfield is a subject more for the brush than the pencil, and

\* See *Builder*, pp. 117, 135, *ante*.

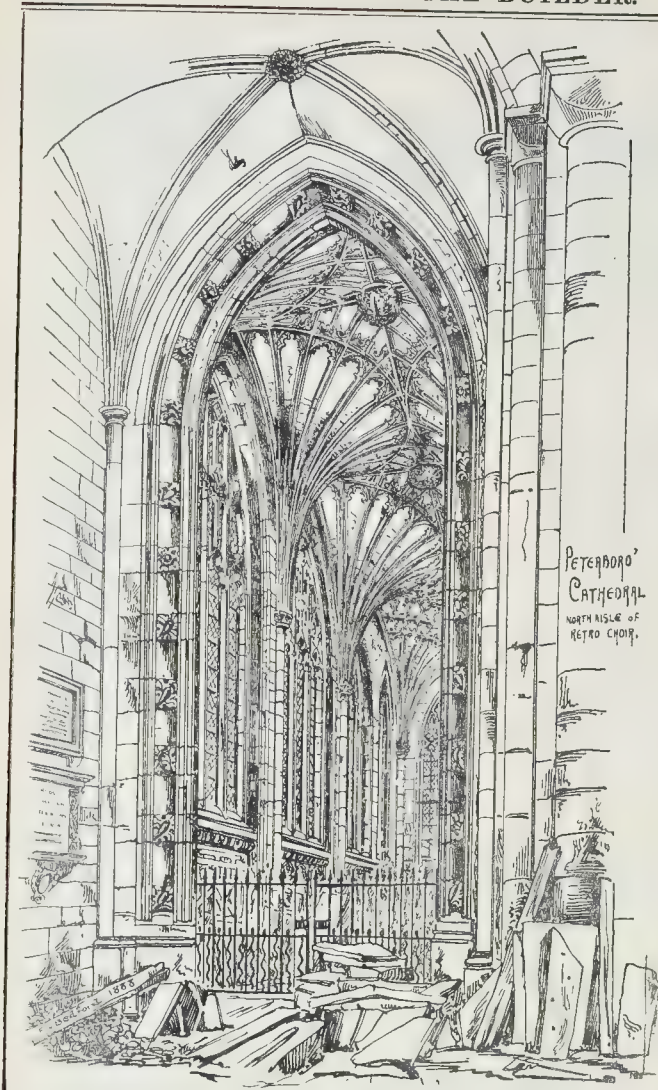




Sketches Illustrative of the Architectural Association Excursion.

Hardwick did not afford a great amount of interesting detail; but Bolsover Castle was full of choice bits, and there being a fair amount of time allowed there, as much work was done as at any of the places visited. The lantern-light and angle-turrets taken from the lead flat are marked features in almost every view of the castle; the turrets being treated as octagons on the inside, whilst retaining their square form on the exterior, and the embattled parapet being carried round the turrets, but attached to them: the sketch-plan will best explain this. The stone flagging in the Pillar-room is simple and effective; and the corbels receiving the vaulting ribs in the room in the Bailey ward appear to do their work well; but the greatest interest was evinced in the wonderful variety and treatment of the chimney-





#### SKETCH IN PETERBOROUGH CATHEDRAL.

THIS sketch in the aisle of the retro-choir at Peterborough is by Mr. F. D. Bedford.

The whole of the Cathedral east of the crossing is at present in a dismantled condition and undergoing the process of repair. The principal work is at present being done in the north transept, where underpinning is being done to the walls, which are out of plumb more or less, leaning inwards in some places and outwards in others. "Toe" buttresses are being built at the ground or floor level, internally or externally as required, to check further settlement.

#### Illustrations.

##### CLEMENT'S INN CHAMBERS.

THESE premises consist of large shops on the ground-floor, and offices and chambers on the upper floors, with separate entrances from the Strand. Externally, red-brick facings with Bath-stone dressings and granite pilasters have been used. In execution, some deviations have been made from the design as here represented. The whole of the works have been carried out by Mr. F. Johnson, of Walthamstow, from the designs of Mr. F. Hemings. The drawing was exhibited in this year's Royal Academy exhibition.

##### STATUE OF SHAKESPEARE FOR PARIS.

THE statue of which we give an illustration has been presented to the City of Paris by an Englishman, Mr. William Knighton.

The statue is of bronze, and is the work of M. Paul Fournier. The complete work includes a pedestal designed by M. Deglane, architect, decorated with tragic masks and with scrolls bearing the names of the poet's principal works. On the principal face is a cartouche, with the words "William Shakespeare" merely.

The position of the monument is at the junction of the Boulevard Haussman and the Avenue de Messine.

##### WOLLATON HALL.

THE view which we give of Wollaton Hall is referred to in another column, in connexion with the Architectural Association Excursion. The history of the building was very ably treated of in a paper read by Mr. J. A. Gotch during the excursion, and printed in *extenso* in the *Builder* for Aug. 25, p. 136.

##### TOWER OF YOULGREAVE CHURCH, DERBYSHIRE.

YOULGREAVE Church was one of the buildings visited by the members of the Architectural Association during their recent excursion, as mentioned by us a fortnight ago (p. 136, *ante*).

##### STONEFOLD CHURCH.

THIS Church is in the parish of Haslingden, Lancashire, and was presented to the parish by a resident, Miss Turner. It accommodates about 300 worshippers. The builders were Messrs. Moore Bros., of Rawtenstall. The architect is Mr. Basil Champneys.

##### DESIGN FOR A LONDON STREET-FRONT.

THIS illustration shows a design made by Mr. C. E. Mallows, in the Royal Academy, and submitted in competition for the £25 premium. The materials proposed to be used were red brick and stone dressings.

##### The Metropolitan Board of Works and its Agenda Paper.

Mr. Mossop, a member of the Board, writes to say, with reference to a "Note" that appeared in our last issue, that while our description of the agenda-paper was quite correct, and in accordance with the facts, a reform in the direction indicated was made about a month before the recess, when the "papers" were put in order and sewn together, so that in this matter there is now order instead of chaos. We are very glad to hear it, but we must say that the last of the Board's agenda papers which we saw (for a meeting only two or three weeks before the recess) did not exhibit any change for the better.

pieces and fireplaces throughout the building.

On Wednesday the only peep the party got of Tissington Manor is shown in a small sketch taken from the road.

There was a long stay at Ashbourne, which afforded time for an examination of the finest church visited during the week—as, indeed, it is also the finest in the county.

From Bradbourne we illustrate an interesting piece of glass from the staircase window of the manor-house, and an incised slab in the form of a shield from the church.

Thursday was the grandest day for the sketch-books, when Haddon Hall was visited, and good use was made of the time, though we do not propose to illustrate the building just now.

We illustrate one or two interesting details from the elaborate tombs in Bakewell Church; and Youlgreave, visited later on, gives the subject of one of our plates, which shows the stately western tower, from a rapid sketch by Mr. J. Johnson. A careful and delicate drawing by Mr. Gibson of the beautiful altar-tomb in the chancel to Thomas Cockayne is given on page 176.

Friday's visit to Wollaton gave the subject for another plate, also by Mr. J. Johnson; and there are also other "bits" as sketches, notably the angle pavilion and angle turrets, with

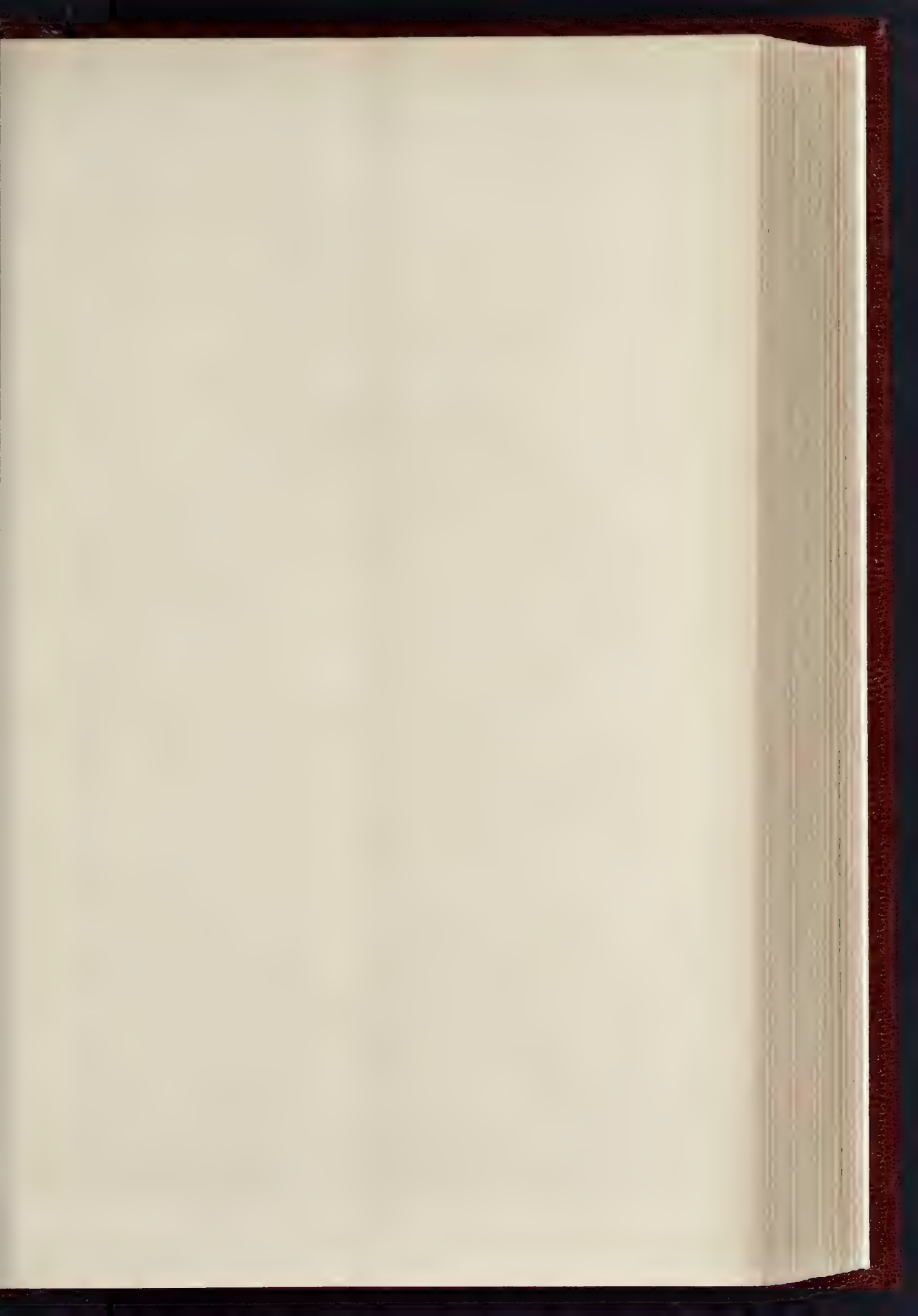
their singular corbelling out, and a rain-water head from the stable-yard.

The members of the excursion who have contributed sketches for our illustrations are Messrs. Jas. Bilson, W. T. Brown, S. F. Clarkson, D. Gibson, A. Hennings, and J. Johnson, and, though they are but a very small proportion of the whole party, when there was sketching to be done, most of them were to be found at work.

##### Competition for a New Town Hall in Copenhagen.

—The Corporation of Copenhagen is inviting preliminary designs for a new Town Hall in that city, the cost of which is not to exceed 140,000*l*. This sum does not, however, include the cost of preparing the site on which the building is to stand, &c. The design must provide for an entrance hall, with covered carriage approach, a covered courtyard 3,000 yards square, and an assembly hall of 1,000 yards, besides magisterial offices, library, police office, fire station, residences for officials, and a restaurant. It is to be lighted by the electric light. The design must be sent in by March 1, 1889, and for the three best premiums of 300*l*. and 200*l*. each will be given. Final drawings and plans, with estimate of cost, will then be invited from the competitors selected, of whom the successful one will receive a sum of 500*l*. and the others one of 160*l*. each.

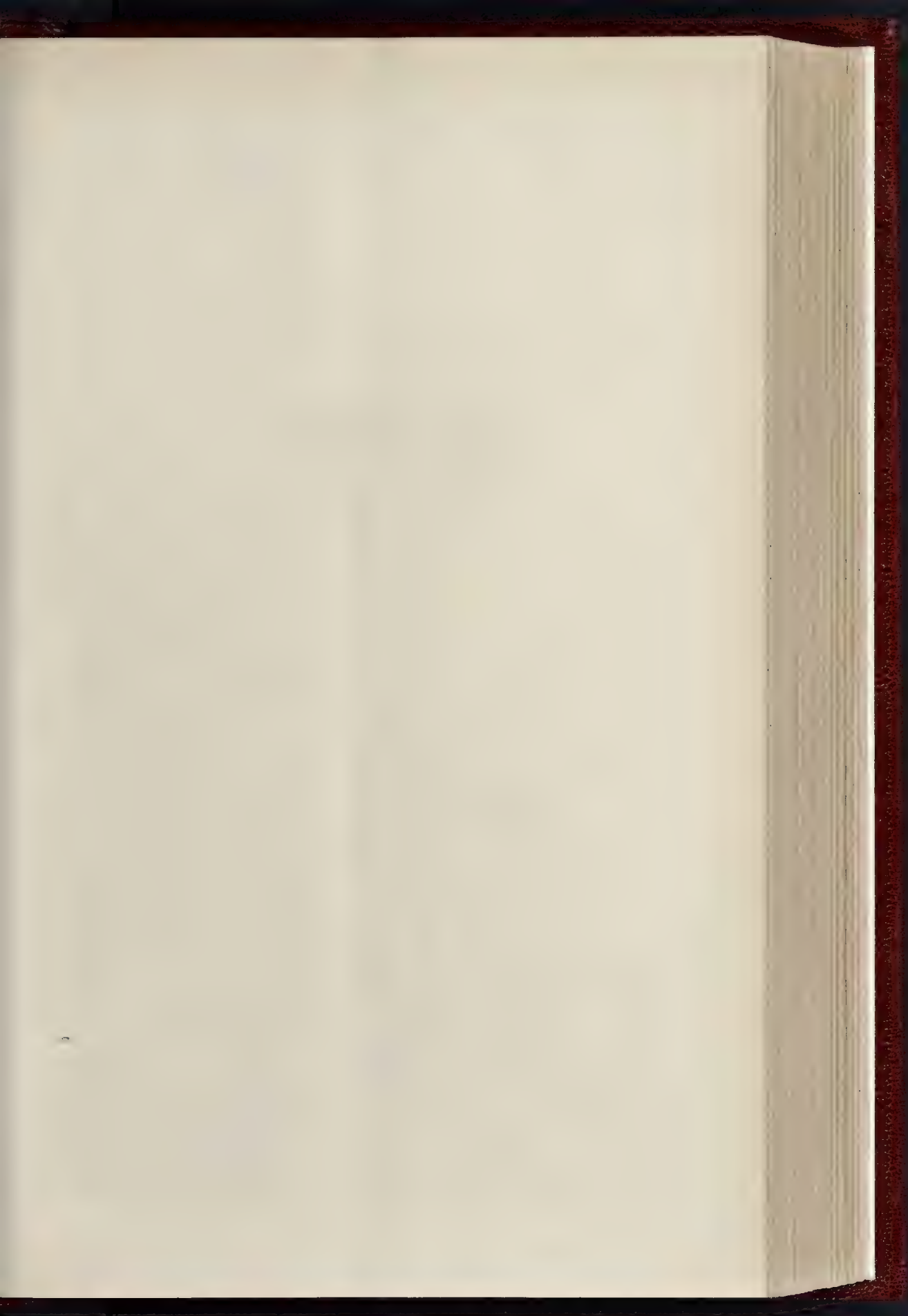






CLEMENT'S INN CHAMBERS.—MR. F. HEMINGS, A.R.I.B.A., ARCHITECT.





THE BUILDER, SEPTEMBER 8, 1888.

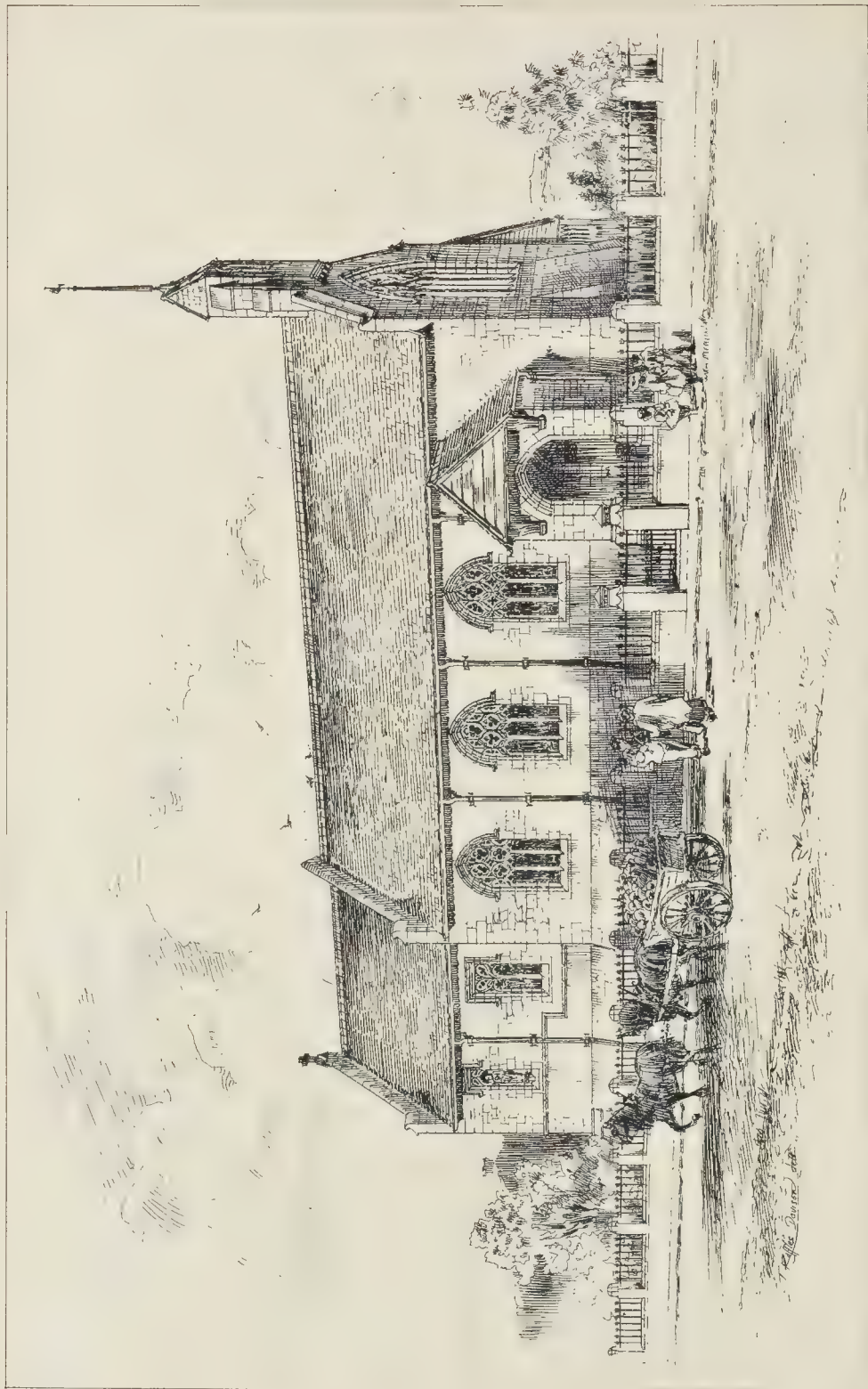


WOLLATON HALL FROM THE NORTH WEST.—FROM A SKETCH BY MR. J. JOHNSON, A.R.I.B.A.





THE BUILDER, SEPTEMBER 8, 1888.





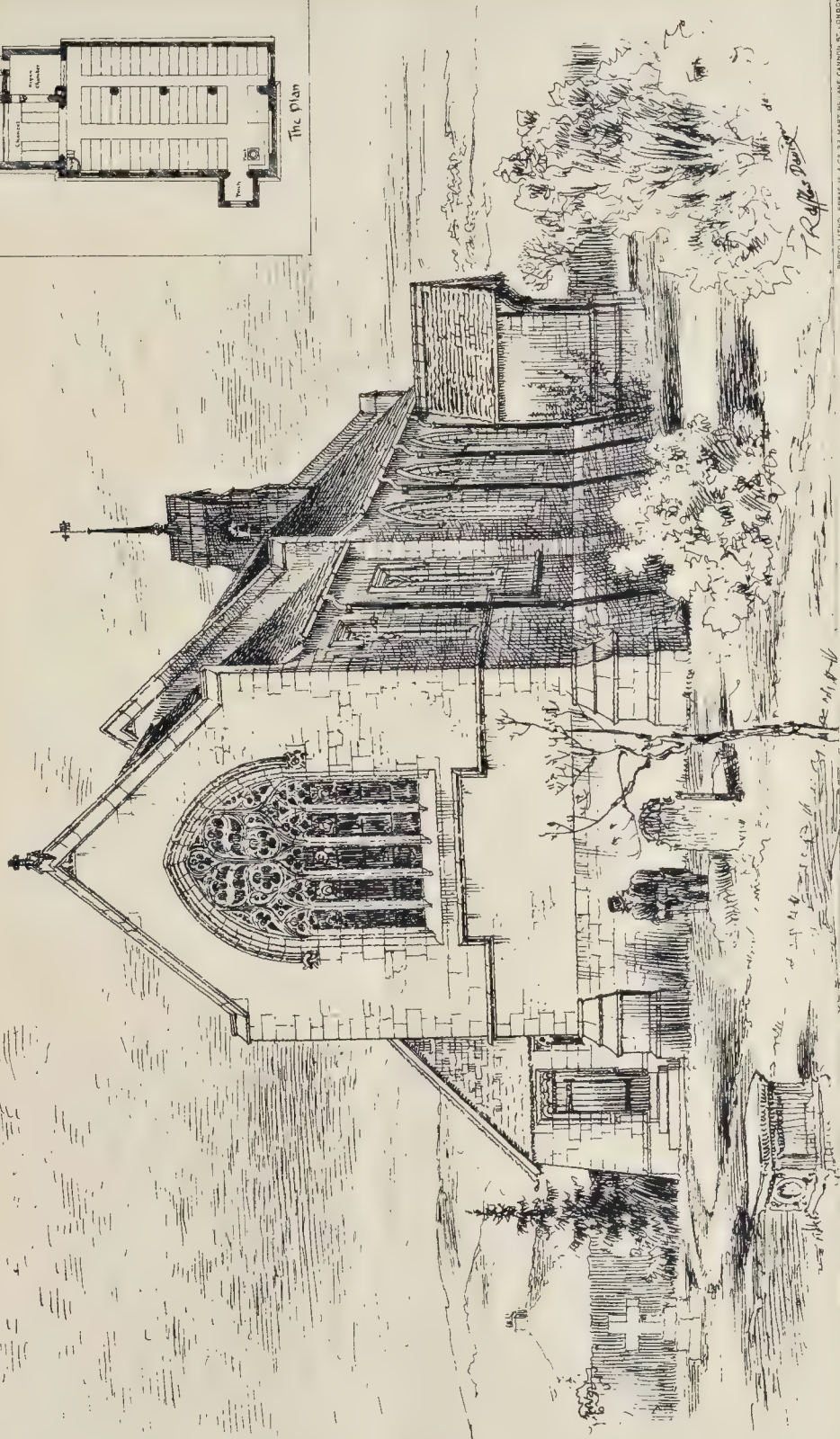
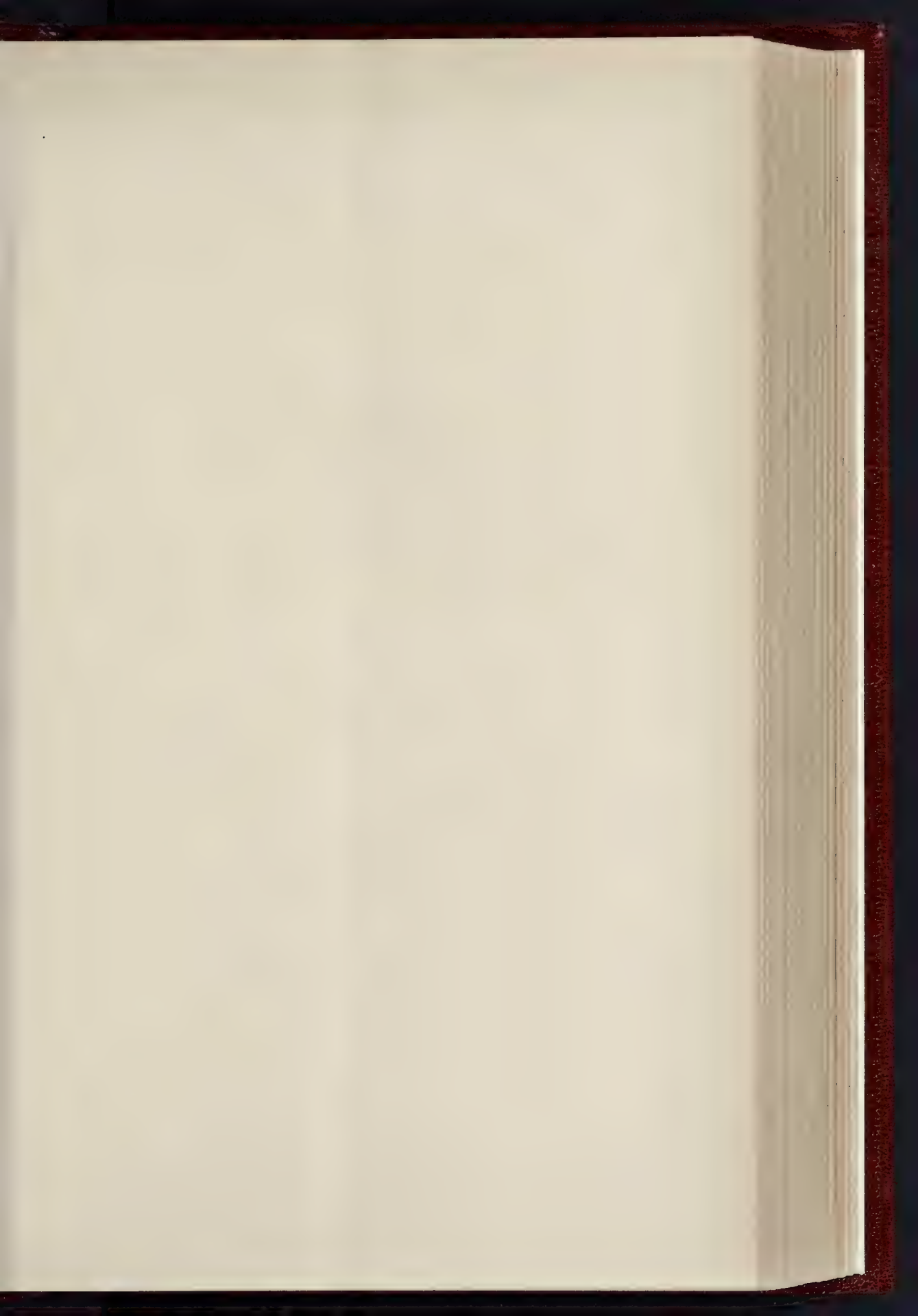


PHOTO LYTTON SHAWES & CO 22 MARK LANE CANON ST. LONDON E.C.

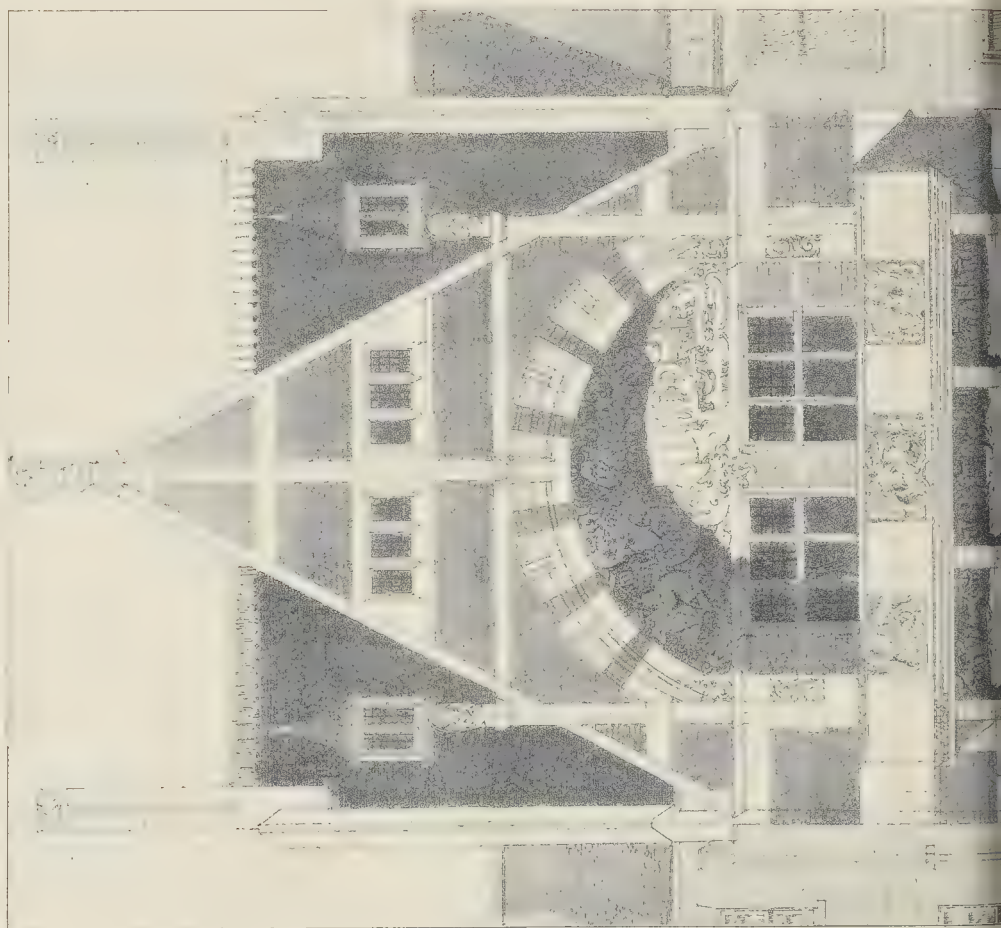
STONEFOLD CHURCH, LANCASHIRE - MR. EASIL CHAMENEYS, ARCHITECT  
NORTH EAST VIEW.



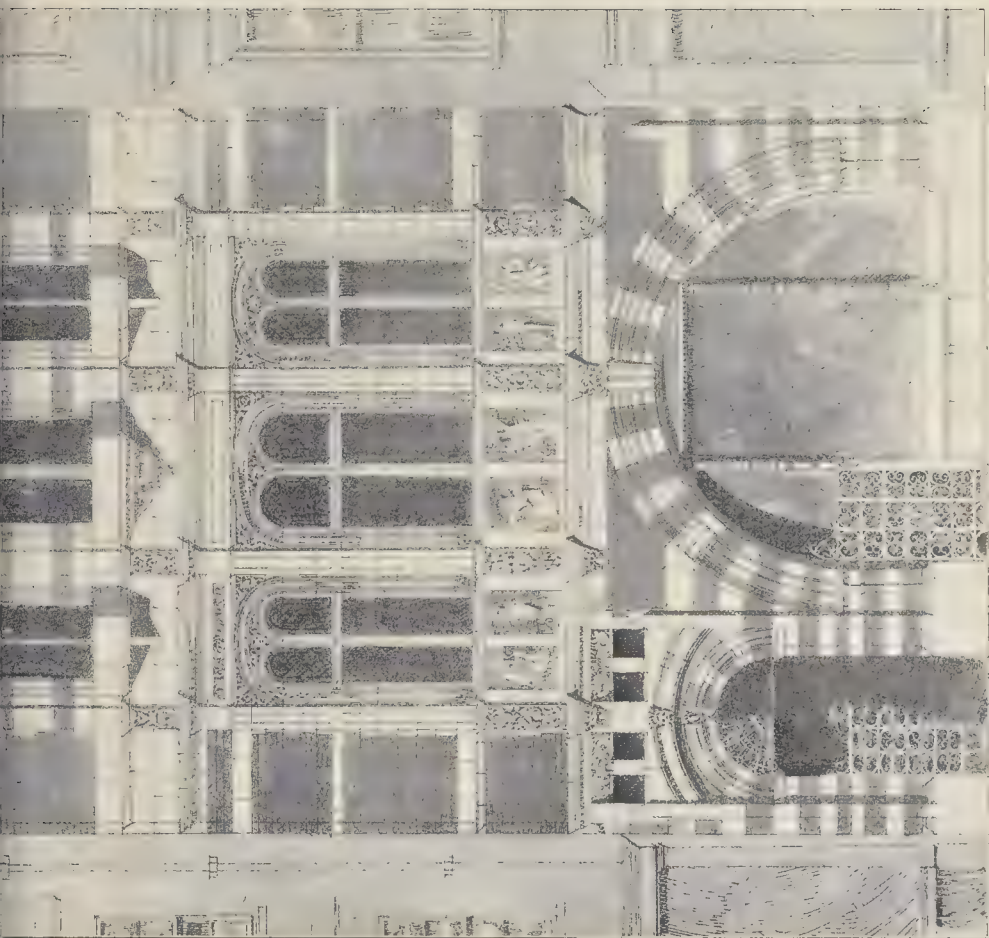




THE BUILDER, SEPTEMBER 8, 1888.







DESIGN FOR A LONDON STREET FRONT.—By Mr. C. E. MALLONS.







YOULGREAVE CHURCH.—FROM A SKETCH BY MR. J. JOHNSON, A.R.I.B.A.







THE PHOTO. SPRAGUE & CO. 22 MARTIN LANE, LONDON E.C. 4

STATUE OF SHAKESPEARE, PARIS.—M. PAUL FOURNIER, SCULPTOR.





# THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION: FURTHER EVIDENCE.\*

MR. GEORGE EDWARDS, sworn and examined by the Chairman of the Commission (Lord Herschell), said he had been for nearly fifteen years a member of the Board, and was one of the representatives of the parish of St. Marylebone. He was deputy-chairman of the Board for the two years ending at Midsummer last. He was a member of the Board at the time that the sub-committee that used to deal with compensation cases ceased to exist. There was a sub-committee of some fifteen or seventeen members. Witness, soon after he became a member of the Board, moved that questions of compensation should be referred to a committee of the whole Board instead of to a sub-committee. His reason for taking that action was that he used to sit next to Mr. John de la Haye, a solicitor (since deceased), who at that time was the representative of Holborn. Mr. de la Haye was on the sub-committee in question, and from him witness learnt of certain things which made him think that some claims were settled not quite to the interest of the public, and he thought it would be much better for the whole Board to decide such questions. At that time the negotiations for compensation in connection with the Harrow-road improvement were going on. Witness carried his motion, and then questions of compensation had been settled by a committee of the whole Board, meeting prior to the Works and General Purposes Committee on Monday mornings. Asked whether he did not think that the committee of the whole Board was too numerous a body to go into detail, witness said he did not think so. The Compensation Committee met before twelve o'clock—at eleven, or half-past eleven, according to the number of claims to be considered. The Works and General Purposes Committee met at twelve o'clock. As a rule, there were only fourteen or fifteen members of the Board who attended to compensation work, and they were pretty nearly always the same members. The number of members present during the discussion of compensation business never exceeded twenty. The Board from time to time became possessed of a large amount of property in the shape of surplus lands resulting from the carrying out of improvements. The management of this property was always in the hands of a separate Estates Committee. When a street improvement had to be made, the ground was cleared soon after the property had been acquired, and the improvement was carried out on the plans and under the superintendence of the Engineer. The Engineer laid his plans of the surplus lands before the Board, and these surplus lands were afterwards plotted or divided by the Architect. Afterwards, tenders were invited for the several plots. Asked whether these arrangements did not place the Board very much in the hands of its officers, the witness said that when the plans came up from the Engineer and the Architect, there were some very pertinent questions put to both those officers about the property, especially as to lines of frontage and the arrangement of the street generally. The plans submitted by the officers were not always approved. Witness had taken an active part in the inquiry into Mr. Robertson's conduct, and had never voted in his favour. He personally was never very much aided by Mr. Goddard's advice in questions of compensation. The way in which compensation cases were managed was this: Mr. Goddard used to act for Mr. Vulliamy, and used to give the committee his valuation of the freehold and the leasehold. Then they used to have a report from Mr. Gunn, the Accountant, as to the queries he had made with reference to the case done. Mr. Gunn used to go through the books and read to the Committee what returns had been made and what profit they showed. The Committee very frequently differed both on Mr. Goddard and from Mr. Gunn, and then they asked that further professional opinion might be taken, and cases in which that occurred were adjourned. The reports of the officers named were not copied and distributed to each of the members of the Committee; they were merely read out. Lord Herschell remarked that this did not seem to be a very good way of arriving at a sound conclusion,—a number of people hearing figures

read out. Witness said that the members very soon took the figures down. In the course of re-examination by Mr. Meadows White, Q.C., the senior counsel for the Board, witness said that Goddard was the officer chiefly charged with the preliminary work of investigating compensation claims and expressing his opinion upon them. That was nominally Mr. Vulliamy's work, but Goddard was really the man who did the work. Asked whether he had any suspicion, until recently, of Goddard's honesty, witness said that the first suspicion he had was on a certain reference made by him to Mr. Villiers, as to whether he (Villiers) would advance on his offer for the Pavilion site. Goddard came back and said that he had committed the Board. Witness put together the two circumstances that Goddard had first of all introduced Villiers and had then so hastily committed the Board, and he began to have very grave suspicions of Mr. Goddard. The Chairman (Lord Herschell) said he thought it was Mr. Vulliamy who had hastily committed the Board in the matter of the disposal of the Pavilion site? Witness said that nominally it was so, but he and other members always "read between the lines" of the "Architect's Reports." Mr. Vulliamy was so weak that he was an inefficient officer. Goddard and Robertson were Mr. Vulliamy, practically, for the last four or five years of Mr. Vulliamy's tenure of office. Witness had for years endeavoured to convince his colleagues that they ought to insist upon the resignation of Mr. Vulliamy.

Mr. G. B. Richardson, sworn and examined, said he had been a member of the Board since 1862; that he had been deputy-chairman of the Board; and that he had served on almost every one of the Board's committees, except the Building Act Committee. He had lately, as he had done on several previous occasions, made some remarks upon the fact that the Building Act Committee did not always give the reasons for their actions. He had always been complaining, more or less, that that Committee did not communicate the reasons why they refused the applications which were made to them. When witness was appealed to, by those whom he represented, to ascertain the cause of such refusals, he was always able to get the information, either from the Superintending Architect's office, or from some member of the Committee, and he never could see any reason why the grounds for refusing a building application should not be communicated to the applicants. There were more complaints brought against the Board through the action of the Building Act Committee than through any other committee. The procedure of the Building Act Committee, indeed, had provoked much of the hostility manifested by the public towards the Board. He had recently stated that the reticence of the Committee as to the cause of the refusal of applications led to fees being paid to get matters put forward, and to delay and corruption. He had not formed that idea prior to the institution of the present inquiry, but he had previously from time to time protested against the action of the Committee merely as a matter of principle and business-like conduct. To take an instance: A person sent in an application to be allowed to bring his house out to a certain line, and the Committee did not agree to that particular line. They would have agreed to another line, but instead of telling the applicant to what line they wanted it to come, they left him to make another application, and when he made the right application it was granted; but, of course, this involved a great deal of delay. Witness had formed very much the same opinion of Mr. Vulliamy that Mr. Edwards arrived at,—namely, that Mr. Vulliamy was too much in the hands of Goddard and Robertson. Mr. Vulliamy was for very many years an excellent officer; but of late years he had been very deficient—so much so that although he (witness) was a very old friend of Mr. Vulliamy's, he had again and again urged the Chairman of the Board to induce Mr. Vulliamy to resign. During the last few years that Mr. Vulliamy held office there was really no proper head to the staff of the Architect's Department; anyone who took an active part in the work of the Board could see that Mr. Vulliamy was more the servant of the staff than the head of the staff. But Mr. Vulliamy was very loth to leave. His pecuniary position was not of a very first-class kind. He knew that if he left the Board he would not perhaps be able to provide for his wife and daughters the same comforts that they had hitherto had, and he was very unwilling to go. When his resignation was tendered, it was not voluntarily tendered; it was written because it

was communicated to him that it was desirable and necessary that he should resign. The matter of urging Mr. Vulliamy to resign was not formally brought before the Board, but it was indirectly. Nobody seemed to be inclined to take the initiative in the matter. The members of the Board all liked Mr. Vulliamy as a man. He was a gentleman in every sense of the word, and one with whom it was impossible not to sympathise. They all felt that to tell him to go would be a most unpleasant duty. It was ultimately done in this way:—A Committee was appointed to consider the whole question of the staff of the Superintending Architect's Department, and then, in that Committee, remarks were made bearing upon Mr. Vulliamy's inefficiency; and in a kind, courteous way, he was informed of the feeling of the Committee. He shortly afterwards sent in his resignation. There was no other department of the Board which was ever in so unsatisfactory a condition as the Architect's, unless one went back to the early period of the Board's existence. At that time they had an Accountant who was utterly inefficient; but the present Accountant, Mr. Gunn, was an admirable officer, and his department, since he had been there, had been in perfect order. He did not believe that any Board's accounts were kept in so admirable a manner as theirs. Witness had no reason to suppose that there was anything unsatisfactory about the acceptance of any of the tenders for the execution of the Thames Embankment or other works: there had never been the slightest attempt at favouritism at all. The tenders submitted were dealt with on their merits, and if the lowest one was not put in by a man who was deemed to be utterly incompetent to do the work, it had always been accepted. Witness had never had any faith in Mr. Robertson since the year 1875, when the question of his disposal of a copy of the Board's reference book of compensation claims was raised. As to Mr. Goddard, he had no reason to suspect him; he believed him honest.

Mr. James Beal, sworn and examined, said he had taken a great deal of interest in the Metropolitan Board of Works and its proceedings since its origination. He alleged that the method of the Board's former procedure in requiring sureties for the due performance of a contract was corrupt. Mr. Ridley, who tendered for a part of the Embankment, offered to deposit 30,000*l.* in cash, but his offer was not accepted.

Mr. William Webster, sworn and examined, said he was the son of the late Mr. William Webster, the contractor. His father did not take any contract after the year 1882-83, but his business was carried on with a partner until two years ago. That partner was Mr. Staniland, formerly M.P. for Boston. He believed that Mr. Staniland was purely a financial partner. Witness had commenced a business of his own in March last, but he had not the books of his father's business.

Mr. Mark H. Judge, who affirmed, was next examined by the Chairman. He said he was a member of the Paddington Vestry, and happened to be foreman of the coroner's jury at the inquiry into the fire at Whiteley's in 1887. The attention of the jury was directed to the rapid spreading of the fire, and much surprise was expressed as to the extraordinary rapidity with which the fire spread throughout the several buildings. The jury made several recommendations or representations, one of which was "that the serious danger which may result from unscientific construction where ironwork is largely used calls for immediate attention, with a view to such amendment of the Building Act as will secure the requisite supervision." On the occasion of that inquiry, Mr. Saunders, who was the architect of the building, and Mr. Gundry, the District Surveyor, gave evidence. No suggestion was made to the jury either by Mr. Saunders, Mr. Gundry, or Mr. Roche (Mr. Whiteley's solicitor, who was a member of the Board at the time the buildings were erected), that there was any doubt as to their having been carried out in accordance with the requirements of the Building Act. The fire resulted in four deaths. Mr. Judge then gave evidence at some length as to the procedure of the Board and the Vestries under the Metropolitan Local Management Acts, 1855 and 1862, and described the steps he had taken with a view to getting an inquiry into the Board's affairs. He attended the Board's own inquiry, and gave what evidence was in his possession as to the Board's improper proceedings in regard to the disposal of land.

We will conclude our summary of the evidence next week.

\* For summary of previous evidence see the *Builder*, p. 8, 44, 66, 83, 109, 124, 161, ante; and last volume, p. 382, 396, 490.



## NEW PUBLIC WORKS IN CARLISLE.

DURING the recent Northern District Meeting of the Association of Municipal and Sanitary Engineers and Surveyors, held in Carlisle,\* several short papers of practical interest were read by Mr. H. U. McKie, the City Surveyor, describing new public works carried out from his plans and under his superintendence. We make the following extracts from these papers:—

*Public Slaughter-houses.*

The slaughter-houses were commenced at the end of October, 1886, and opened at the beginning of November, 1887. The area of the site is over an acre. The buildings consist of five separate blocks, viz.:—I. Slaughter-houses and cooling-rooms for cattle and sheep. II. Lairage for cattle and sheep. III. Pig slaughter-house, cooling-room, boiler-house, and tripery. IV. Piggeries. V. Office, stores, fodder-house, meter-house, w.c., and urinal. The total cost of the work, including approaches, drainage, fittings, &c., was 6,101l. 19s. 2d.

The pigs have been kept entirely separate from the cattle and sheep, being on the left side of the main entrance roadway. The buildings have been designed so that animals being taken to them never see the slaughtering till they are taken to be slaughtered; the approaches to the different alleys being shut off by large sliding gates, hung on Hatfield's patent pulleys.

With a view of keeping the buildings cool, as much sun has been shut out of them as was possible, considering the aspect they have.

The insides of the slaughter-houses and cooling-rooms are lined, for a height of 6 ft., with white enamelled bricks. The rest of the buildings are of stock bricks, with pressed brick pilasters and arches. The floors are of concrete, in two layers, the bottom one of 1 of cement to 4 of gravel and sand, and the top layer of 1 of cement to 2 of Dalbeattie granite. In the outside floors the bottom layer is 3½ in. thick, and the top layer 1½ in. thick; in the inside floors the bottom layer is 2 in. thick, and the top layer 1 in. thick. The surface is finished rough to give a good foothold.

The offal is collected for removal by means of tubs, which are taken when full on iron two-wheeled carriages to the crane in the main roadway, and hoisted up and emptied into the tumbler cart, and carted away each day by a contractor, who pays 2s. 6d. a ton for it. The carriages and tubs are so arranged that one man can easily load the tubs and tip them into the tumbler cart.

The following is a short description of each block:—

**I. Cattle and Sheep Slaughter-house Block.**—This block consists of seven slaughter-houses, each 18 ft. by 18 ft., and seven cooling-rooms, 18 ft. by 12 ft. each. There is room to keep the carcasses of 12 beasts and 64 sheep in each cooling-room, and 12 more beasts and 36 sheep in each slaughter-house. That is to say, that 168 beasts and 700 sheep can be slaughtered in one day, and the carcasses left on the premises to cool. The slaughter-houses are fitted with overhead rails, which run through the slaughter-houses and cooling-rooms, and out under the overhanging roof, which projects 6 ft. into the loading alley; the latter is to enable the carcasses to be loaded for the market under cover. The beasts are hung from the overhead rails, and the sheep from side rails fixed to the walls, just above the glazed brickwork.

**II. Lairage Block.**—To the west, on the opposite side of the slaughter-house alley, each of the slaughter-houses has lairage for cattle and sheep. The byres hold four cattle each, and are 15 ft. 1 in. by 11 ft. 3 in. The sheep-sheds hold 80 sheep each, and are 15 ft. 1 in. by 13 ft.; they are divided down the centre by an iron railing and a water-trough. The doors to these lairs are so arranged that the animals are obliged to go the way they are wanted to. The total number of animals that can be kept in these lairs is 29 cattle and 210 sheep. The Corporation have decided to build an additional byre to hold 16 cattle.

**III. Pig Slaughter-house Block.**—This block consists of a pig slaughter-house, 30 ft. 6 in. by 30 ft.; a cooling-room, 34 ft. 6 in. by 30 ft.; a boiler-house, 30 ft. by 10 ft.; and a tripery, 30 ft. by 15 ft. The slaughter-house and cooling-room are fitted up with three rows of overhead rails, with three scalding-tubs at the west end, and three large doors, 7 ft. 6 in. wide, at the other end, where the carcasses can be loaded for market. These doors are fitted with Attwood's

patent rolling shutters. The tubs are heated by steam direct from the boiler; steam is also laid on into the tubs in the tripery. The building is lighted by a glazed portion along the whole length of the centre of the roof, with louvres for ventilation on each side of it. It is also ventilated by means of movable louvres in the north wall. 234 pigs can be hung in the cooling-room, and 102 more in the slaughter-house, making a total of 336, which can be killed in a day and their carcasses left to cool.

**IV. Piggeries.**—The piggeries consist of fourteen separate pigsties, with a raised range and inspection passage down the centre. The feeding-troughs are placed along the front, and the pigs are fed through doors hung so that the troughs can be either shut in or out of the sties. Each piggery will hold 15 pigs, making a total of 210 pigs which can be kept in the piggeries.

**V. The Office Block.**—This block is situated near the entrance, and consists of a superintendent's office, 15 ft. by 13 ft.; store-room, 15 ft. by 13 ft.; fodder-house, 15 ft. by 20 ft.; meter-house, 8 ft. by 8 ft.; w.c. and urinal. Nearly all the butchers in the city have gone into the slaughter-houses, which are paying their working expenses and the interest on the money borrowed for their construction, though they have only been opened six months. The following are the charges made:—Killing a beast, 1s., calf, 6d., sheep and lambs, 2d., pig, 6d., pig under 50 lb., 3d. Lairage after the first 36 hours—beasts, 8d. a day; pigs, sheep, lambs, and calves, 1d. a day; half these charges are made if the animals are kept in the paddock outside.

*Police Office and Cells.*

In 1879 the accommodation at the Police Office was found inadequate, there being only two small cells on the lower basement floor, 5 ft. 4 in. by 8 ft., and three cells on the basement floor, 9 ft. by 6 ft. The Chief Constable's office was only 15 ft. by 6 ft. 6 in.; the day-room, 15 ft. by 14 ft.; Committee-room, 24 ft. by 16 ft.; and on the present site there was also the Chief Constable's house, consisting of kitchen, sitting-room, three bedrooms, pantry, and w.c. The Watch Committee requested the author to prepare plans giving extra accommodation, doing away with the old Chief Constable's house, and building a new one, to the north of the Police Office, but not communicating with it. After fully considering the subject and making several sketch-plans for the committee, the author recommended the Watch Committee to gut all the interior walls out except the staircase, and to entirely remodel the interior of the Police Office. The result was to get six cells on the lower basement floor, which is the same level as the ground at the outside of the old City Wall, and level with the drill-ground, nine cells on the basement floor, in all fifteen more convenient and larger cells than the five old ones.

On the ground floor or level of the west walls and the principal entrance to the Police Office, the day-room was increased to 22 ft. 3 in. by 14 ft. 6 in.; the sergeants' office, 14 ft. 9 in. by 13 ft. 3 in., there being no sergeants' office before; a Chief Constable's office, 14 ft. 9 in. by 13 ft. 3 in.; Committee-room and library for records of patents, 23 ft. 6 in. by 22 ft. 3 in.; passage 6 ft. 6 in. wide, in lieu of the old passage, 4 ft. 6 in. wide. The boiler-house for heating apparatus is on the lower basement floor, and all the cells are heated with 4-in. diameter hot-water pipes.

The ventilators are so arranged that the ventilation of all the cells or any one of them can be manipulated from the day-room without going near the cells, and it can be seen at once how each cell is ventilated from the day-room ventilating regulator and indicator. The passage to the basement cells is lighted by Hayward's patent floor and stall lights.

The whole of the building is well ventilated, and each water-closet soil-pipe has a separate ventilator carried above the roof.

In addition to the Police Office, a new Chief Constable's house was erected, four stories high; it has front and back entrance, the latter entering the drill-ground. The house contains dining-room, 14 ft. 6 in. by 18 ft.; drawing-room, 12 ft. 3 in. by 14 ft.; five good bedrooms; kitchen, 14 ft. by 11 ft.; bathroom, two w.c.'s, lavatory, pantry, scullery, washhouse, storeroom, coal-house, &c. The total cost of the works was 2,620l.

*Record of House and other Junctions on Main Sewers.*

The importance of having a true record of house and other junctions will be patent to all

who have been bothered for the want of such a record. The records prevent injury to the sewer, as it need not be cut into, injured, or disturbed by opening, and the private drain connexion with the sewer can be made at the least possible cost of labour and the least interference with the traffic of the streets.

The positions of the junctions have been fixed by taking the distance above or below house-door jambs, window jambs, line of buildings, street corners, and other prominent landmarks, as near as possible to the junction to be recorded.

Mr. McKie also read a paper on "Lazonby Flags," which we printed in the *Builder* for Sept. 1, p. 162.

*The Public Baths.*

Mr. J. Hepworth, Assoc.-M. Inst. C.E., Engineer of the Carlisle Corporation Gas and Water Works, contributed to the meeting a short description of the baths recently erected by the Corporation of Carlisle. These baths were erected in 1883-4 on a corner site—bounded on two sides by James-street and Wood-street, Victoria Viaduct—previously unoccupied and belonging to the Corporation. The frontages in James-street and Wood-street are 100 ft. and 125 ft. respectively, and the total area is about 1,378 sq. yards.

The building was intended to be simple and unpretentious in character, and is designed in the domestic style of architecture, carried out in red brick, relieved with red-stone dressings and terra-cotta panels, all of local production.

The basement has been fully utilised, and in addition to the space occupied by the swimming-baths, hereafter referred to, ample space has been allotted to a boiler-house, workshops, laundry, and other purposes. In the basement, perfect access is obtained to the whole of the exterior sides of the three swimming-baths, and to the whole of the water inlet and outlet pipes to every bath, and to every drain throughout the building. The subways, or basement floors, are formed of cement concrete.

The ground-floor is approached by a few steps from the principal entrance, James-street. To the left of this entrance, the office and residence of the superintendent are situated, and from the window of this office tickets and towels are supplied to bathers before admission to the entrance-hall.

The entrance-hall forms an important feature of the building. This hall is 20 ft. long by 11 ft. 6 in. broad, and 16 ft. in height, and from it the entrances to all the different sections of the baths radiate. The floor is laid with decorated tiles; round the walls of the hall is carried a panelled and moulded dado of pitch pine; the ceiling cornice, doors, and all the woodwork are also of pitch pine. The upper panels of the vestibule door are glazed in leaded panes, and bear the two coats-of-arms of the City of Carlisle, and the upper panels of the other doors leading from the entrance-hall are glazed with obscured glass with the names of each bath cut thereon.

The baths have been divided into four sections, three of which are completed, viz.:—Section 1, Gentlemen's first-class baths; Section 2, Gentlemen's second-class baths; and Section 3, Ladies' first and second class baths. The fourth section has been reserved for a Turkish bath, which has not yet been constructed. The separate entrance to each section is indicated on the respective doors within the entrance-hall.

The whole of the slipper-baths are of porcelain, and the swimming-baths are constructed of cement concrete.

In Section 1 (gentlemen's first-class bath), situated in the north wing, the entrance corridor divides the slipper-baths from the swimming-bath. There are four slipper-baths—supplied with hot and cold water, with shower attached. Lavatories are fixed in each apartment, and the fittings throughout are of the most modern and complete character. There are also vapour and spray baths. The swimming-bath in this section is approached from the opposite side of the corridor, and is 6 ft. by 30 ft. by 3 ft. 6 in. deep to the water-line at one end, falling to 6 ft. 6 in. at the other. The bath is constructed of cement concrete, the side walls being 2 ft. in thickness and the floor 12 in. in depth. The bottom is paved with white glazed bricks, with three parallel lines of brown glazed bricks along the entire length for the guidance of divers. The sides are tiled with white glazed tiles bordered at the top with tiles of a pale blue pattern. Steps of masonry lead down into the swimming bath at each end. Handrails are fixed round

\* See *Builder*, p. 11, ante.



on sides of the bath, and overflows (also used as spittoons) are fixed at convenient distances in the water-line.

The water is run into this bath by a 4-in. main, and also by a spray pipe at the shallow end of the bath. The water in the bath is heated by a supply of steam introduced at the deep end of the bath, and the water is discharged at the outlet into a 12-in. diameter pipe leading to the public sewer. The footways round the bath are laid in coloured tiles, with redstone coping.

There are seventeen dressing-boxes arranged round the footway, and the necessary toilet arrangements have been provided throughout.

The dimensions of this apartment are 72 ft. long by 39 ft. broad, and the walls rise to a height of 14 ft., being worked in panels. The dado, mouldings, and pilasters are in red brick, and the panels in buff, relieved by a cornice of terra-cotta bricks. Running along the greater length of this wing is a lantern light in the roof of this building, which serves the double purpose of giving light and ventilation. The roof is constructed of light ironwork.

As adjuncts to the swimming-bath there are a foot-bath, with shower-bath attached, a lavatory, urinal, diving-stage, and a drinking-quantity of Doulton ware.

In Section 2 (gentlemen's second class baths), situated in the south wing, 75 ft. long by 57 ft. broad, there are seven slipper-baths, also a vapour and a spray bath. The swimming-bath is 35 ft. by 30 ft., and the depth of water is the same as in the first class, and as the bath is constructed, lighted, and ventilated in the same manner, no further reference to it is necessary. In this section twenty-eight dressing-boxes have been provided on the north and south sides of the bath. Above the dressing-boxes, balconies with balustrade and seats are provided for the use of spectators on the occasion of a swimming entertainment, or competition. The balconies are approached by a stairway leading from the footway, and a foot-bath, shower-bath, fountain, and the necessary adjuncts have been provided as in Section 1.

Section 3 includes the ladies' baths, subdivided into first class and second class. Within the entrance to this section a ladies' waiting-room has been provided, and a corridor leads to the various baths. There are four slipper-baths, one Roman, one vapour, one spray, and three shower baths. A swimming-bath 29 ft. by 16 ft., with a depth of water from 3 ft. to 5 ft., seven dressing-boxes, a foot-bath, and the usual adjuncts, furnishings, and toilet arrangements complete this section.

Section 4 is reserved for a Turkish bath if required.

The swimming baths and most of the slipper baths are lighted from the various roofs, the remainder from windows in the front of the building. The arrangements for lighting the swimming baths in the evening are by gasaliers of wrought iron. The arrangements for heating the building are as complete as possible in every respect. Hot-water pipes are laid throughout the whole building, those in the swimming and slipper baths being of 3 in. diameter, and laid through the dressing-boxes; while the entrance hall is heated by a coil of pipes.

Ventilators on the Tobin principle have been fixed in the several swimming apartments, and these, with movable openings in the lantern lights, constitute the provision for ventilation.

An abundant supply of pure water is obtained from the public mains, from which a 4-in. main has been laid into the building; the water used is measured through a 4-in. water-meter, but is now provided free of charge by the Urban Sanitary Authority.

Two Cornish boilers, 16 ft. 6 in. long by 5 ft., and a water superheater, fixed in the basement story, have been found necessary for heating the water supplied to the slipper baths, and for providing the requisite steam supplied to the swimming baths, vapour baths, and laundry. The swimming baths are kept at a tepid temperature throughout the year. A chimney 100 ft. high stands in the rear of the boilers.

The laundry is supplied with Bradford's apparatus, including washing-boiler, washing-troughs, washing-machine, wringer, wringer, soap-boiler, clothes-bins, hydro-extractor, and drying-closet, fitted with six sets of travelling horses running on castors. Steam has been utilised for all laundry purposes, and a small engine of two-horse power drives all the machinery. There are entrances to the laundry and boiler-house from Wood-street.

The entire cost of the building, baths, and furnishings was £7,000, and was provided from

the profits of the Gas Works, specially appropriated for the purpose from the City Fund, and the Engineer of the Gas and Water Works was employed as the engineer and architect for the baths, and was assisted by Mr. H. Higginson, Carlisle, then a member of his staff.

The baths were erected to meet a pressing want in the City, and for this purpose the tariff of charges was fixed at a low rate. That this want has been met is abundantly evident in the appreciation and support which is regularly accorded to the baths.

#### *The Main Roofs of the Corporation Markets.*

Mr. Arthur T. Walmisley, M. Inst. C.E., read a paper describing the central main roofs of the new Carlisle Corporation Markets. He said that the new Market roofs now in course of construction in the City of Carlisle cover an area of about 6,300 square yards, exclusive of surrounding arcades, shops, and offices which are connected with the market buildings. A length of about 197 ft. 6 in. by about 211 ft. 6 in. in width, forming an area of about 417 squares (of 100 superficial feet), is roofed over in three equal spans of 70 ft. 6 in. each, supported by walls at Scotch-street and New-street sides, and by twelve intermediate columns, set out at distances of about 39 ft. 6 in. apart, parallel to these streets. The central span of 70 ft. 6 in. is carried round at an angle towards Fisher-street, so as to enter this thoroughfare nearly at right angles. This length is about 76 ft., and is enclosed upon one side by existing buildings, and upon the other side partly by a fish market covering 2,370 square feet, or say 24 squares, and partly by a three-cornered roof of 600 square feet.

The main ribs of the roof covering the general market are of the braced arch type, consisting of a rigid wrought-iron rib 13 in. deep in the centre, having a curved outer surface struck with a radius of 44 ft. 6 in., and forming a truss connected by round bar-iron ties having screw adjustments, the total depth from the back of the rib at the centre to the springing line being 18 ft. 9 in., and to the horizontal tie 11 ft. 6 in., which horizontal tie is placed 7 ft. 3 in. above the springing line. The soffit to the curved member of the truss is struck with three radii of 41 ft. 6 in., 58 ft., and 11 ft. 6 in. respectively, the depth of the arched portion near the springing being 18 in. The flanges consist of two 3½ in. by 3½ in. by ½ in. angle irons, united vertically with a ½-inch web plate. The round bars in the ties are of scantlings varying in diameter from 1½ in. to 2½ in., and in order to secure a proper connexion between the inclined tie-rods and the segmental rib at the springing, the feet of the principals at the junction of the rods are spread out laterally, the webs doubled, and the tie-rods united to the curved member by pins of 4 in. diameter.

Owing to the unsymmetrical form of the plan of the roof, necessitated by the shape of the ground available for market buildings, special ribs were required in some parts of the design. Thus a special intersection rib had to be designed to be fixed at the junction of the central span with the continuation of that span towards Fisher-street; and at the end of the side span adjoining New-street, where it abuts against the fish market, special hipped ribs were introduced; but the whole of the ribs were designed so as to preserve harmony throughout, and to maintain a uniformity in the general appearance.

In order to avoid as little interference as possible with the space of the market, the number of columns was minimised by carrying alternate main ribs upon spandrel girders of 38 ft. span, 4 ft. deep at the ends, diminishing to 3 ft. deep at the centre. These girders are fixed between the heads of the columns at a uniform level throughout, but owing to the levels of the adjacent streets, and in order to avoid the great inconvenience of steps to a market, the floor is made to slope towards one end, and consequently the height of the columns varies with the gradient of the market floor. The columns are of cast iron, 18 in. diameter, 1½ in. metal, with brackets cast on, above the capitals, to suit the design of the main ribs. They average 28 ft. in length, and are to be noticed as a successful adoption of an octagonal body developing into a square head and base instead of the stereotyped circular form. The lateral force of the wind upon the roof is transmitted through the main ribs to the columns, and the columns are rigidly fixed so as to provide the necessary reaction to resist it. By these means the side walls are left to take only their own wind

pressure, and such portions as are communicated to them by any wind pressure which the columns may not take; but as nearly the whole of the horizontal force from the roof ultimately becomes transmitted to the columns, the eleven columns which come between Scotch-street and New-street had to be designed to resist this pressure. To provide a base sufficiently strong for this purpose, and also to facilitate the fixing of the columns, as well as the drainage of the roof, the bases were cast separate from the columns, the faces at the horizontal joints being planed and securely fixed by eight 1½ in. bolts at erection. The bases, which are 4 ft. 9 in. square, are each firmly bolted down by four 2½ in. diameter anchor bolts, bedded and firmly secured to a cast-iron anchor plate, fixed in and below a mass of Portland cement concrete, 10 ft. 6 in. square and 6 ft. thick. The rain-water from the gutters between the spans is conveyed down the column by wrought-iron tubes 6 in. diameter of 16 B.W.G. plate, between which and the internal faces of the columns concrete is firmly packed, adding weight to the foundation, and forming a permanent protection to the columns from oxidation, by the continual passage of surface water.

The main purlins, which are carried by the main ribs, are 19 ft. 9 in. long, and are of lattice construction, with parallel flanges, each flange being made up of two 2½ in. by 2½ in. by ½ in. L.I. Intermediate ribs are carried between the centres of the main purlins. They are also of the parallel lattice type, and are struck from the same centres as the arched portion of the main ribs. Between each main purlin, intermediate or secondary purlins will be fixed so as to divide the roof into convenient dimensions, transversely as well as longitudinally, for boarding and glazing. The secondary purlins are of a fish-bellied lattice type, 9 ft. 10½ in. long, with a depth of 12 in. under the boarded and slated portion of the roof, and 9 in. under the glazed portion. The glazing-bart to be used is known as "T. W. Helliwell's King's Cross bar." Helliwell's system has been employed by the author in the large roof over Olympia at Kensington, and has also (the author is informed) been used in Carlisle in the roof connected with the Corporation Baths. Each span of the roof will be surmounted by a skylight carried by central ornamental trusses, 22 ft. span, placed 9 ft. 10½ in. apart. Between the skylight and the curved roof, vertical louvre frames are provided, filled in with wrought-iron louvres. The lower portion of the curved roof, and also the lower portions of the skylights, are to be covered with slates on 1½ in. boarding, and the remaining portions are to be glazed.

The three spans of the roof at the West Tower-street end of the general market rise above the buildings, and are, therefore, to be closed in with gable screens of a special design, suited to the character of the building. Two of these screens are complete segments, but the third is cut into by the tower at the New-street corner, necessitating a modification of the detail in the half span. In the design of these screens the author has avoided the heavy parallel members usual in screens for large roofs, and has introduced vertical triangular trusses, having their bases connected to a horizontal bowstring-shaped girder. This horizontal girder is 4 ft. deep in the centre, and is trussed upon the inside so as to obtain lateral stiffness at the support of the vertical trusses. It not only acts as a tie to the feet of the screen rib, but supports a lead flat upon the outside about 14 ft. in width. In resisting the lateral pressure of the wind upon the screen, the glazing is prevented from being blown in by horizontal angle irons, supporting at intervals the glazing-bars, and fixed to the vertical trusses placed 7 ft. 1 in. apart, which act as ties to hold up the horizontal girder. These vertical trusses having at their base the same depth as the ordinates of the fish-bellied horizontal truss, which is fixed at the level of the springing of the main principals, gradually taper off as they approach the end arched rib, and thus the effective depth of the screen varies with the stress, increasing from the outer surface towards the centre of the lower portion, where the stress is greatest. In the side span adjoining New-street, under the hipped ribs of the general market roof adjacent to the fish-market, a special form of transverse truss is adopted, the whole being rigidly connected together, so as to avoid trussing the ridge longitudinally.

The central span of the roof is considered to need no diagonal wind bracing, but the side spans are thoroughly braced diagonally with 3 in. by ½ in. bars.







was distinctly a fifteenth-century Swiss weapon. It was not introduced into England before the first quarter of that century, and fell into disuse on the death of Henry VIII. It appears to have been highly esteemed in Scotland, where several examples are preserved. There is one, imagined to have been used by Robert Bruce at Bannockburn (1314); another, at Drummond Castle, is said to have been used by Lindin at the same battle; another, at Cluny Castle, with almost precisely the same details, seems to have been taken as the model for the sword of Wallace. There are several in the Tower, some of which are merely for processional purposes. The sword carried by Wallace in his statue is, therefore, nothing but a fifteenth-century weapon, such as he could never have seen. Placed in an upright position the pommel reaches higher than the armpit, and it would have been physically impossible to draw it from the scabbard, which is out of our view in the statue, but from which we must assume Wallace has managed to extract it, inasmuch as a sword belt is shown for its support across the hips, in the position usual at his time. I am, therefore, driven to the conclusion that the Aberdeen statue does not represent with any degree of accuracy either an English or a Scotch soldier of Wallace's period, but that it is a mere fanciful equipment of which the details range from Roman times to the Wars of the Roses. This is greatly to be regretted, and there is the less excuse for it, because the subject of armour, weapons, and dress has been so closely studied of late years that Scotchmen were justified in expecting that, if they could not get a portrait-figure of one of their greatest men, at least they would have something approaching to a faithful representation of him "in his habits as he lived." Making every allowance for the exigencies of sculpture,—for what I believe is called "the sculptural style"—this thought arises, what a picturesque and sculptural figure might have been produced, whether the man had been shown in the wildness and freedom of his own country's garb, or in the more dignified panoply of the soldiers of the nation against whom he fought so well. In either case, with all our knowledge, we might at least, without let or difficulty, have had truth, and Scotchmen, and particularly Scotch antiquaries, could have pointed with satisfaction, if not with pride, to the figure of the illustrious patriot, instead of passing it, as many must now do, with a shrug, or even a shudder.

ALBERT HARTSHORNE.

August 29, 1888.

## ANCIENT INSCRIPTION AT KENDAL.

SIR,—During the removal of a house to improve the west approach to the new bridge at Appleby, a stone, with the following partly-obliterated inscription, was found:—

"Reto porta potens nulli ——— ota."

The Rev. Canon Matthews, of Appleby, suggests that the blank has been filled in with "proprio nisi (oto)"; and Mr. Bell, of the same place, thinks it possible the missing-link may have been "custode (em)oto."

No record can be obtained as to the date of the erection of the bridge, nor has any data been discovered in its removal to enlighten us, but I am of opinion the structure is very ancient, and my theory has always been that it was originally the gate-bridge to Appleby Castle, and Mr. Bell's filling-in of the blank space would seem to rather favour this view; but, on the other hand, there is authentic record that in ages past there was a chapel over the bridge, and it may well be, therefore, that the blank was filled in by words meaning "that no one should get the gate opened to except those who properly attended to their vows."

Perhaps some of the archaeological or antiquarian readers of the *Builder* may be able and willing to exercise themselves in solving the problem.

Kendal, August 25.

JOSEPH BINTLEY.

## ARCHES, NAVE TRIFORIUM, BEVERLEY MINSTER.

SIR,—Very recently the Vioar of Beverley Minster found in the triforium of the nave (both north and south sides) several round-headed arches, some having the zigzag ornament.

The Vioar, when pointing them out, told me there was a difference of opinion as to whether they, with some of their surroundings, form a part of the earlier church, or are materials rebuilt.

The following seem to me to point to but one conclusion:—

The zigzag ornament does not run uninterr-

ruptedly from one voussoir to another, though the soffit is even. This is to some extent not unusual; but here the difference is frequently as much as several inches. The same ornament in some cases comes down below the impost, in others finishes higher by several feet, and this, too, at times in the same arch.

Were these arches an undisturbed part of the earlier church the columns should be of greater bulk; here they appear too slender to contain the core of Norman work. HENRY LITTLEHALES.

Bexley Heath, Sept. 1.

## THE BASSET MOTTO.

SIR,—Your correspondent, "Griffith," [p. 144, ante] has, seemingly, mistaken the main reason for the agitation to change this motto as it figured on the badges of the Welsh (41st) regiment. The main error was in the use of a word, *anguen*, which has no existence in the Welsh language, for *anguen*, not in the smaller mistake of "neu" for "na."

Your citation of the words as they stand at Beaupré supports the philologist in this. As Horne Tooke said: "Letters, like soldiers, are apt to desert and drop off in a long march," and contraction is evidently responsible for the change from "angry" to "anguen." It will soon stand correctly on the regiments' appointments, I presume, proud in the triumph of its contention, "Qwell angueu na chywilydd." BERT HARRIS.

## PROPOSED PUBLIC LIBRARY, &amp;c., NEWTON HEATH.

SIR,—I should like to call attention to the "Conditions of Competition and Instructions to Architects," drawn up by the Newton Heath Local Board of Health. If the Manchester architects are caught by such a bait as this they must be even more in want of work than we are in London.

When each condition is so charmingly reasonable and generous, it is difficult to point to any one particularly worthy of notice. You will observe, however, the amount of work required in the preliminary competition (practically a complete set of working drawings), and that after making two such sets, the successful competitor may be rewarded with the handsome sum of 50*l*! The idea, also, of the successful man being obliged to provide the premiums for the unsuccessful competitors is new to us in London; as is also the honour of being associated with the Engineer to the Local Board in carrying out the work. It would appear that the Board also expect the builder to work as cheaply as the architect who may be so fortunate as to be selected by them, for they require Public Library, Science and Art Schools, extension of Public Offices, Assembly Rooms, and Public Baths to be built for 8,000*l*. A Clock Tower to be included "if the funds permit."

ED. W. MOUNTFORD.

London, Sept. 5.

## "CEMENT FINISHING FOR PAINTING."

SIR,—In reply to "An Architect" [p. 163], it would be better to discard Portland altogether, and only have one cement,—viz., Keene's,—as, until the Portland is thoroughly dry, it is almost sure to create an efflorescence through whatever material may be put upon it, whether another cement or only paint. It is not at all wise to paint over Portland till eighteen months after plastering. If the work is in progress, or must be done in the way stated, then, as a precaution, paint only one coat of B.O. and red lead mixed with white zinc paint as a priming, and let it stand so for eighteen months. If then there is no efflorescence, it will be safe to do anything; but not until that time. W. B. DEVERILL.

## FLOORING.

SIR,—If "Boaz" [p. 163] had filled up the space under the floor with good rubbish, well rammed, to within 6 in. of the finished floor level, and on the top of that had first put 8 in. of Portland cement concrete and then 2 in. of coke breeze concrete, he could have nailed the floor-boards directly down to the latter without having any joists at all, and he would have saved thirty shillings per square at least. The coke breeze concrete, which is composed of 4 parts of coke breeze to 1 of Portland cement, should be well mixed, first in a dry state, and then water gradually added till it is quite sloppy, because the coke breeze absorbs a great quantity of water. Strips of wood, 3 in. by 2 in., should be placed on edge at intervals of 6 ft. or 8 ft., to form screeds to get a level surface.

The coke breeze should be left at least three weeks before the boards are nailed down. I am surprised that this kind of flooring has not become universal by this time, but apprehend that architects are not aware that it is so much cheaper than sleeper walls, plates, and joists; they surely must know that it is very much better.

CHARLES F. MOXON.

## CHIMNEY-POTS.

SIR,—With reference to the letter of "C.J." [p. 144, ante] respecting metal caps upon chimney-shafts, I quite agree with you that there can be no valid reason for forcing them. It has also occurred to me that there can also be no reason for the use of chimney-pots. To my mind, the effect of many a good building has been marred by them, while any advantage supposed to be derived by the extra draught could as well be attained by raising the shaft to the same elevation, and then finishing it in an ornamental manner. Perhaps some of your readers may throw some light on this matter. W. G. L.

## The Student's Column.

## ARTIFICIAL STONES.—X.

## Concretes.

**T**HAT special class of artificial stones termed "Concretes" is usually understood to represent various mixtures of lime, cement, coarse gravel, pebbles, and sand, incorporated with water. A few brief remarks must suffice for this section of our subject, as it has been already frequently and fully discussed in the columns of this and other technical journals, and in papers read before various learned societies.

One of the earliest English patents for concrete was that taken out in 1810 by J. Kent, who directed that powdered quicklime should be mixed with fine sand (or any material of which any kind of stone is formed in a natural way); after these have been intimately incorporated, coarse sand or gravel is added with just water enough to enable these materials to be very powerfully rammed or pressed together in moulds of desired form; the stones are finally put under cover, and in the open air to season. Powerful ramming, trituration, or violent concussion of the concrete mixtures, is an essential part of the procedure required to enable many of them to be successfully applied. Vitruvius recommended that mortar should be well beaten with wooden staves before being used. J. Gibbs, in 1850, stated that, in proportion to the force applied to it in pounding so will the cement become indurated after setting; he therefore recommended that artificial stone formed of any water cement, mixed or not with limestone, should be powdered strongly in a mortar with water, or as an alternative plan to place the mixture in moulds which are elevated, and allowed to fall repeatedly. The concussion so produced will cause the block or the article to become so consolidated that, if a good cement has been used, it will, after standing for a short time, become equal in hardness to freestone.

A point of some importance, which is remarked on by Mr. H. Reid in his well-known treatise on concrete, is, that although ramming improves most cement mixtures, an exception must be made in the case of those containing Roman cement, as the operation in this case would seriously disturb the indurating action which speedily sets in.

The secret of good concrete is a very open one, and lies in the quality of the mortar used. It is a good old saying that "a silk purse cannot be made from a sow's ear," and equally true is it that reliable concrete or artificial stone cannot be made by "chucking" together any dirt, rubbish, stone, and cement without regard to the proportion or the compatibility of the ingredients. The late Mr. T. Anson, referring to this subject in the columns of this journal nearly twenty years since, said very truly, "that the success of such work (i.e., concrete building) depends upon the entire honesty of the man who does it"; we would add, after the word honesty, the further qualification of intelligence, for many an honest worker has turned out worthless work through sheer ignorance of the principles to be borne in mind. The proportion of lime or cement to be mixed with the stones and sand is another matter to be carefully considered, too much or too little of either class of ingredients greatly reducing the durability of the product, the perfection of proportion, according to Mr. C. H. Smith, being reached when each particle of sand is covered with lime to about the thickness of an ordinary coat of paint, and in this country one of the most approved mixtures is one of good lime to three of sand. The degree of fineness of the sand is of some consequence; if it is too fine, the individual grains do not get well coated with lime, and if too large, interstices unfilled with



cement result, weakening the product. If water-worn pebbles are used they should be mixed with pure sand, and, if possible, roughly broken up so as to present as many angles as possible, and so permit of the formation of a more highly compacted mass. The use of rammers in consolidating the concrete after it has been placed *in situ* is efficacious, owing to the more thorough contact of the lime or cement with the grains of sand, particles of flint, gravel, &c., and the consequent filling up of interstices and expulsion of air which result. The reason for desiring so thorough a contact of the lime with the siliceous matter is that a portion of the cementing effect is due to the formation of a superficial coating of silicate of lime. In order to ensure this union of lime and silica, Fernikoff exposes equal parts of lime and sand to a temperature of 150° C. for several hours in presence of steam, and the material is then pressed, moulded, and exposed to the air for several weeks.

Glazer used in his process a much larger proportion of sand, 4 to 6 parts being mixed with 1 of slaked lime, and then exposed to a high temperature, under a pressure of three atmospheres, and finally pressed into moulds.

Headley's artificial granites and marbles (1866, patent 2,956) were formed of good clean sand, fine gravel, or other pulverable siliceous matter, with sufficient fat lime, well mixed together. The natural dampness of the gravel will slake the lime, "which, heating, will unite superficially with each grain of sand." When the compound has become cold it is to be moistened with sufficient water to enable its particles to pack together. This is to form the interior or hard basis of the stone, the surface being covered with a smoother and more ornamental composition made from granulated marble and unslaked lime. Mineral oxides, &c., may be added to give colour, and if extra hardness and polish be desired the blocks should be saturated for a few hours in a solution of water glass at a temperature of 300° F.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

12,857, Ventilator. H. Waddington.

This invention consists in placing inclined boards or louvres in a ventilating-shaft or trunk in such position that, while there is sufficient passage for air, steam, or smoke, they will at the same time prevent any rain getting into the room over which the ventilator is fixed.

13,127, Butt-hinge and Fixing. A. Stephenson.

It is claimed that the hinge which is the subject of this patent not only answers the purpose of hanging a door, but, on the door being opened, such hinge causes the door to rise for the purpose of clearing the carpet. It also closes the door automatically after it has been opened. The pin on which the hinge moves is placed off one side of the line of hinge-plates. By this means the door is raised higher or lower in proportion as the hinges are placed farther from their ordinary position. The hinges may be used alone or in combination with those of the ordinary kind.

13,258, Revolving Door Post. W. H. Dutton.

This invention consists of a post on each side of the door, the said post being made round, or of similar form, and fixed on spindles affixed to the sill and lintel of the door-frame. These revolving posts are to be used at the corners of staircases or passages to facilitate crowds passing in and out of public buildings.

6,023, Sash-fasteners. J. Trimick.

The object of this invention is to provide a sash-fastener by which both sashes may be locked, or one sash may be locked and the other left free to open a certain distance, or both may be free to open a certain distance for ventilation, or free to open fully for cleaning, the fastener being arranged so that it cannot be seen or opened from the outside. The fastener is let into the pulley-stile or the side frame of the window in line with the meeting-bars of the two sashes, and it consists of a plate by which it is secured to the side frame. At the back of this plate is a slide, secured to the plate by straps, and formed with two lateral catches or guides, which project through the plate and into recesses at the side of the sashes. The slide is connected with a suitable handle, by which it may be pulled out or pushed in as required, means being provided to secure it temporarily in either position.

9,234, Bolts for Doors, &c. J. H. Cartland.

According to this invention, the staple ends of the bolts and their barrels or sockets are made in cross sectional form, having a close "necked-in" form for ease in manufacture.

9,560, Mortar-mills or Edge-runners. W. Eddington.

The mortar-mills which are the subject of this patent are made readily portable by mounting the

mill on a base frame, which may be raised off the ground and supported on wheels for travelling, the frame being provided with gear for raising and lowering the mill when required.

9,656, Water-closets. A. Elmendorf and others.

The idea of this invention is to ventilate the air-space in the basin through a pipe connected to it at one end and with the stand-pipe at the other end. The pipe is filled with water for flushing the basin, and takes the place of the tank or reservoir in general use. The invention consists in the combination of a three-way cock and special valves so arranged that the falling of a column of water in flushing draws after it the foul air, while the filling of the stand-pipe forces the same through an outlet.

##### NEW APPLICATIONS FOR PATENTS.

Aug. 24.—12,225, K. Bernhard, Safety Contrivance for Windows.

Aug. 25.—12,258, T. Whittaker, Hinges for Folding-doors, &c.

Aug. 27.—12,324, A. Gibson, Feed Mechanism for Saw-mills.—12,325, W. Yelland, Jun., Sash-fasteners.—12,329, A. Boulton, Don't-knob Attachments.—12,330, W. De Morgan, Construction of Walls or other Brick Structures.

Aug. 28.—12,350, J. Elwell, Portable Roofs for Temporary Buildings, &c.—12,397, W. Thompson, Sewer-gas Excluders.—12,408, J. Rasleigh, Insertion of Nails or Screws into Brickwork, Concrete, &c.

Aug. 29.—12,415, J. Porter and J. Wright, Fastenings for Doors and Windows.—12,460, T. de Cohn, Fastening or Securing Window-sashes.

Aug. 30.—12,470, G. Falconer, Framing Sash-windows, Doors, or Shutters.—12,493, J. and J. Leber, Mechanism for Checking the Time Worked by Employes in Factories, &c.

##### PROVISIONAL SPECIFICATIONS ACCEPTED.

8,347, F. Lebacz, Composition for removing Old Paint.—9,620, E. Hodder and E. Cooke, Nails.—10,343, J. Crosthwaite, Construction of Chimney-pieces, Mantelpieces, &c.—10,578, A. Dundasdale, Collapsible or Folding Shutters, Gates, Balconies, &c.—10,586, A. McLean, Blocks or Slabs for Paving, &c.—10,669, G. Herdman, Preparation of Asphalt for Buildings, Bridges, Pavements, &c.—10,706, G. Evans, Construction of Window-frames and Hanging the Sashes.—10,757, F. Wendling, Paint for Stones, Plaster, &c.—10,824, C. Torkington, Preventing the Sinking of Window-sashes.—10,979, T. Thorp, Water-meter and Waste Preventer.

##### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

14,630, W. Inne, Ladders.—14,639, H. Alexander, Ventilator for Shafts, Pipes, Roofs, &c.—14,734, S. Carnaby, Apparatus for Turning, Opening, or Closing Ventilators, Balanced Windows, Venetian-blinds, &c.—15,157, D. Greig and Others, Tip Wagons.—7,845, A. Boulton, Sawing Machinery.—10,527, A. Boulton, Machines for Lifting and Delivering Bricks, &c.—10,614, J. Howorth, Self-acting Propeller Ventilators.—11,059, G. Long, Fence-posts, &c.

##### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

##### By F. PIGOTT.

Esher—Ground-rent of 64l. per annum in 71 years £2,285

##### By H. HETLEY.

Kentish Town—11, Leighton-terrace, 53 years, ground-rent £10 10s. 4d. 430

Haverstock Hill 36, Queen's-terrace, 61 years, ground-rent £3 300

##### By H. N. NEWTON & Co.

Soho—50, Berwick-street, freehold..... 1,710

Camden Town—85, Arlington-road, 49 years, ground-rent £1 510

##### By HENNINGS, SKITT, & Co.

Greenwich 40 and 42, London-street, freehold..... 1,630

13, The Circus, freehold..... 760

Deptford—68 and 69, Chancery-street, freehold..... 235

##### By G. NEWMAN.

St. John's Wood—27, Marlborough Hill, 49 years, ground-rent 15s. 1,650

Commercial-road, E.—Ground-rent £88, reversion in fourteen years..... 275

##### By WALFORD & WILKIN.

Deptford—9 to 23 odd, Chipley-street, 72 years, ground-rent £38 1,200

25 to 31 odd, Chipley-street, 72 years, ground-rent £19 600

##### By D. J. CHATFIELD.

Orpington, Kent.—The freehold residence, "Montacute," and 6a. 2r. 3p. 1,950

##### By ORGILL, SWANN, & ORGILL.

Rotherhithe Ground-rent of £52, reversion in 76 years..... 870

Thornton Heath, Parnham-road—Three plots of freehold land..... 200

New Cross-road—Ground-rent of £7, reversion in 57 years..... 160

##### By HOBSON, RICHARDS, & Co.

Fulham-road—No. 527, term 55 years, ground-rent £10..... 285

##### By MURRELL & SCORRELL.

The reversion to £4,204 2s. 11d. in New Consols and Cash, life aged 73 years..... 3,020

##### By NEWBERRY & Co.

Lewisham—53, Court-hill-road, freehold..... 320

##### By GRAVES & SON.

Baywater—15, Cornwall-road, 71 years, ground-rent 3s. 6d. 32p. 450

22, Colville-mews, 62 years, ground-rent £4..... 120

##### By KING & CHASEMORE.

Wishborough Green, Sussex—"Old House Farm," 71a. 2r. 2p. freehold..... 1,700

Freehold meadow land, 6 acres..... 35

##### By E. STIMSON.

Caterham, near—Church-road, freehold land, 3a. 0r. 32p. 1,081

Walworth—105, 107, 117, and 119, Beresford-street, 15 years, ground-rent £12..... 1,081

Brixton, Canterbury-road—Ground-rent of £50, term 55 years..... 1,081

Canterbury-yard—A block of stabling, 58 years, no ground-rent..... 36

Lambeth—1, Wootton-street, 25 years, ground-rent £10..... 15

Walworth—49, Elsted-street, 21 years, ground-rent £3..... 10

Battersea—46, Wye-street, freehold..... 12

Ground-rent of £3, reversion in 83 years..... 17

Ground-rent of £10, reversion in 83 years..... 21

##### By PROTHMER & MORRIS.

Kingston—The Kingston Nursery, 1s. 2r. 31p., freehold..... 3,000

13, Thames-street, freehold..... 4,000

##### By WILKINSON & SON (at Brighton).

Brighton—74, North-street, copyhold..... 2,400

1, Rose-hill, freehold..... 73

##### By E. HOLSWORTH.

Haggerston—7, Gloucester-street North, freehold..... 55

8, Gloucester-street North, 35 years, ground-rent £4 10s. 16

#### Miscellaneous.

**Sale of Building Sites at Lowestoft.**—Last week Mr. A. G. Nolley offered for sale a Lowestoft sixty-four freehold building sites situated on the Kirtley Cliff Estate, commanding extensive views of the German Ocean. The sites were described as occupying a high and bracing situation, and as being within ten minutes' walk of the Lowestoft station, harbour and pier. It was stated that the roads and drains on the estate had been substantially made up. The auctioneer also submitted fifteen plots adjoining the above estate, and abutting upon Hervey-street, Lowestoft. With reference to the plots on the Kirtley Cliff Estate, it was stipulated that the lowest sum to be expended in the erection of houses on any part of the estate should be 400l., whilst as regards sixteen of the plots facing the sea, having frontages of 50 ft. and depths varying from 140 ft. to 209 ft., not less than 1,250l. was to be expended on each. A the plots submitted contained unusually large areas, the smallest having frontages of 25 ft. and depths of 100 ft. The sale took place in a marquee erected on the estate, when several of the plots were sold, the prices realised representing from 5 guineas to 7 guineas per foot frontage, or from 125l. each for the smallest plots to 350l. for those plots facing the sea.

**National Registration of Plumbers.**—On Aug. 18th, in Gordon College, Aberdeen, Mr. Sheriff Brown presented the diplomas earned by members in the district of the Plumbers' Company. Mr. Matthew Hay presided. According to a statement by the Secretary, 3,000 plumbers have already been enrolled by the Plumbers' Company, and seventy-nine of them belong to Aberdeen. Dr. Matthew Hay said that almost the majority of plumbers in Aberdeen and district had now become registered, and the number included most of the best workmen.—The Mayor of Stockton has fixed Friday next, the 14th inst., for a public meeting to be held in the Town Hall, for the appointment of local representatives to act on the district council lately formed in Newcastle.—Mr. J. Barkeley Smith (chairman of the Health Committee, Liverpool) has fixed the same day for the first meeting of the district council formed for applying the registration system in West Lancashire and North Wales.

**Appointment of Borough Surveyor & Sheriff.**—A special meeting of the Highways Committee was held last week, Ald. Hunt presiding, to select a gentleman for recommendation to the Council as Borough Surveyor of Sheffield. Out of 150 applicants for the post the Committee selected six candidates, who were requested to attend the meeting. All the six gentlemen attended, namely, Mr. J. V. Brown, Borough Engineer and Surveyor, West Hartlepool; Mr. Joshua Cartwright, Borough Engineer, Bury, Lancashire; Mr. R. S. Dugdale, Borough Surveyor, Huddersfield; Mr. J. Kayes, Borough Surveyor, West Bromwich; Mr. Thomas Longdin, Borough Surveyor, Warrington; and Mr. Charles Froggat Wike, C.E., Assistant Borough Surveyor, Leicester. After a long discussion the committee agreed to recommend Mr. C. F. Wike, C.E., for appointment. The salary is 800l. a year.



**New Railway and Station Works at Greenwich.**—On the first of next month the London, Chatham, and Dover Company will begin their Greenwich extension line, which has been in course of construction during the last two years. Hitherto the Company have had no direct communication with Greenwich, their nearest station being at Blackheath Hill, which is upwards of a mile from Greenwich. The new railway is a continuation of the Company's extension from Nunhead to Blackheath Hill, which was opened some five or six years since. It commences by a junction with the Blackheath Hill station, and thence proceeding in a north-easterly direction, has its terminus conveniently situated near the centre of the town of Greenwich in Stockwell-street, near London-road, one of the principal thoroughfares in the town being in the immediate vicinity of Greenwich Park. Although the line is scarcely three-quarters of a mile in length, it has involved a heavy outlay, a large amount of valuable property having had to be purchased in some of the best parts of the district. The line, which from its commencement to its terminus passes through a cutting about 25 ft. in depth, intersects no fewer than eight streets, cross all of which bridges have had to be built. The retaining walls on each side of the line have throughout been faced with concrete. A commodious station has been built at the Greenwich terminus. The opening of the line will give the Company and the town of Greenwich several advantages. On the one hand Greenwich will be placed in direct communication with the Crystal Palace, via Lewisham-road, Nunhead, Honor Oak, and Lordship-lane, whilst the Company's Metropolitan Extension Line westward will give access to Victoria and the West-end, and also to the City by Ludgate-hill. Mr. A. Barker, the Company's Resident Engineer, has superintended the construction of the line, Messrs. Lucas & Aird having carried out the works.

**The English Iron Trade.**—The English iron market is continually growing stronger, while its activity is increasing, and values of nearly all descriptions of products are going up. This tendency cannot be attributed to speculation, and must be assigned to the expansion of trade making itself felt both in the home and export departments. Pig-iron has been most actively dealt in during the week, and we have witnessed the singular phenomenon of the Scotch warrumet market having been led in its upward course rather than leading other markets, this fact being due to an improved trade outlook and a decrease of stocks. Scotch makers' iron has risen from 6d. to 6s. 6d. per ton; Cleveland iron is from 6d. to 1s. higher in value; the district brands sold in Lancashire have stiffened to an equal extent, while hematite iron is also quoted 1s. a ton more. Old material is participating in the general advance. Manufactured iron continues quite active, with an almost uniform advance of 2s. 6d. per ton. Tin-plates are not quite so high, but they are enjoying an upward tendency. Steel is in fairly active, and for some descriptions in active demand. Steel ship-plates, like iron-plates, cannot be delivered fast enough, and have advanced 5s. a ton in the North of England and Scotland, as well as on the west coast. There has been a rise in reights this week, and this has imparted a further stimulus to shipbuilding. As regards engineering, it will be sufficient to state that the trade is fairly engaged, while there is a steady improvement in prices.—*Iron.*

**London and Middlesex Archaeological Society.**—We are informed that Mr. Joshua W. Butterworth, F.S.A., Vice-President of the London and Middlesex Archaeological Society, proposes to commemorate the visit of the Society to Edmonton Church, on July 26 last, by the erection of a mural monument in the church to the memory of Charles Lamb, the essayist, and also to the memory of William Cowper, the poet. Mr. James Forsyth, sculptor, of Finchley-road, has been commissioned to execute the work from a design by Mr. Thomas Milbourn, architect, the Honorary Secretary of the Society.

**Bombay Municipal Buildings.**—We are informed that Mr. F. W. Stevens, F.R.I.B.A., has been appointed to design and carry out the new Municipal Buildings, Bombay. Mr. Stevens has just completed the Great Indian Peninsula railway Victoria Terminal Buildings, the most extensive modern architectural work yet erected in India. The Municipal Buildings will be erected immediately opposite the Victoria Terminal Buildings.

**Sanitary Appliances.**—We have received from Messrs. John Bolding & Sons, of South Molton-street, a new and very complete catalogue of plumbers', engineers', and gas-fitters' brasswork, water-closets, sanitary earthenware, gullies, air-chambers, and drain disconnectors. From among a few items it is only possible to single out a few for special mention; but deserving of particular commendation is Messrs. Bolding's "Kenon" pedestal closet, in one piece of earthenware,—one of the best closets of the kind. Its form, aided by the depth of water in the basin, is such as to enable it to be easily kept in a thoroughly sanitary condition. It can be made with self-acting seat or otherwise. One of the most useful improvements in this direction that we have seen for a long time is Bolding's "Balance" closet-seat, which is self-rising, but gradual in action. Bolding's "Tranquil" water-waste-preventing cistern embodies an improvement of much importance. It is emptied by syphon action, but is noiseless, being fitted with a small pipe to the outlet of the supply valve, and a float valve on the syphon, which effectually prevent the disagreeable sucking noise caused during the emptying of the ordinary flushing-cisterns. Messrs. Bolding's excellent "Simplex" and other valve closets, lavatories, gullies, grease-traps, and other appliances too numerous to mention are all to be found figured in this very useful and instructive catalogue. One item among the brasswork we may mention, and that is the "School Board Lavatory Cook," which enables the caretaker of the school to ensure that the water is not wantonly wasted. The catalogue will be handy in every architect and builder's office.

**Sewerage at Newmarket.**—At a meeting of the Rural Sanitary Authority of Newmarket, on the 8th ultimo, plans, specification, and estimate were submitted by their Surveyor, Mr. W. Fraser, for the sewerage of part of Exning. At the same meeting it was unanimously decided to increase the salary of Mr. Fraser to 150*l.* per annum.

PRICES CURRENT OF MATERIALS.

| TIMBER.                  |           |          |          |
|--------------------------|-----------|----------|----------|
| Teak, E.I., .....        | load      | £. s. d. | £. s. d. |
| Sesquiped, U.S., .....   | foot cube | 0 2 3    | 0 3 0    |
| Birch, Canada, .....     | load      | 2 15 0   | 4 15 0   |
| Fir, Dantisc, &c., ..... | load      | 2 0 0    | 4 0 0    |
| Oak, .....               | load      | 2 0 0    | 4 10 0   |
| Canada, .....            | load      | 4 0 0    | 6 10 0   |
| Pine, Canada, red, ..... | load      | 2 10 0   | 3 10 0   |
| yellow, .....            | load      | 2 10 0   | 4 0 0    |

| TIMBER (continued).                                 |        |        |         |
|-----------------------------------------------------|--------|--------|---------|
| Lath, Dantisc, .....                                | fathom | 3 10 0 | 5 0 0   |
| St. Petersburg, .....                               | load   | 5 0 0  | 6 0 0   |
| Wainscot, Oleska, crown, .....                      | load   | 2 10 0 | 3 0 0   |
| Deals, Finland, 2nd and 1st, std. 100, .....        | load   | 8 0 0  | 9 10 0  |
| 4th and 3rd, .....                                  | load   | 6 10 0 | 7 10 0  |
| Riga, .....                                         | load   | 8 0 0  | 7 10 0  |
| St. Petersburg, 1st yellow, .....                   | load   | 9 10 0 | 15 0 0  |
| 2nd, .....                                          | load   | 8 0 0  | 9 0 0   |
| white, .....                                        | load   | 7 10 0 | 10 0 0  |
| Swedish, .....                                      | load   | 7 10 0 | 16 10 0 |
| White Sea, .....                                    | load   | 8 10 0 | 17 10 0 |
| Canada, Pine, 1st, .....                            | load   | 15 0 0 | 24 0 0  |
| 2nd, .....                                          | load   | 9 10 0 | 15 0 0  |
| 3rd, &c., .....                                     | load   | 7 10 0 | 9 10 0  |
| Spruce, 1st, .....                                  | load   | 8 10 0 | 9 10 0  |
| 3rd and 2nd, .....                                  | load   | 6 0 0  | 7 10 0  |
| New Brunswick, &c., .....                           | load   | 6 10 0 | 7 5 0   |
| Battens, all kinds, .....                           | load   | 4 10 0 | 11 0 0  |
| Flooring Boards, sq., 1 in., prepared, First, ..... | load   | 0 10 6 | 0 13 6  |
| Second, .....                                       | load   | 0 7 0  | 0 10 3  |
| Other qualities, .....                              | load   | 0 4 8  | 0 6 9   |
| Cedar, Cuba, .....                                  | foot   | 0 0 32 | 0 0 32  |
| Honduras, &c., .....                                | load   | 0 0 4  | 0 0 34  |
| Australian, .....                                   | load   | 0 0 2  | 0 0 3   |
| Mahogany, Cuba, .....                               | load   | 0 0 44 | 0 0 54  |
| St. Domingo, cargo average, .....                   | load   | 0 0 44 | 0 0 54  |
| Mexican, .....                                      | load   | 0 0 4  | 0 0 4   |
| Tobacco, .....                                      | load   | 0 0 44 | 0 0 54  |
| Honduras, .....                                     | load   | 0 0 44 | 0 0 54  |
| Bur, Turkey, .....                                  | ton    | 5 0 0  | 12 0 0  |
| Walnut, Italian, .....                              | foot   | 0 0 44 | 0 0 6   |

METALS.

|                                    |     |         |         |
|------------------------------------|-----|---------|---------|
| Isaor—Bar, Welsh, in London, ..... | ton | 4 17 6  | 5 0 0   |
| " at works in Wales, .....         | ton | 4 7 6   | 4 10 0  |
| Staffordshire, in London, .....    | ton | 5 5 0   | 6 15 0  |
| Copper—                            |     |         |         |
| British, cake and ingot, .....     | ton | 77 10 0 | 78 10 0 |
| Best selected, .....               | ton | 78 0 0  | 80 0 0  |
| Sheets, strong, .....              | ton | 85 0 0  | 0 0 0   |
| Chili, bars, .....                 | ton | 95 10 0 | 0 0 0   |
| LEAD                               |     |         |         |
| Pig, Spanish, .....                | ton | 13 7 6  | 13 0 0  |
| English, common brands, .....      | ton | 13 10 0 | 13 12 6 |
| Sheet, English, .....              | ton | 14 12 6 | 14 17 6 |
| SPELTER                            |     |         |         |
| Saleman, special, .....            | ton | 18 0 0  | 0 0 0   |
| Ordinary brands, .....             | ton | 17 15 0 | 0 0 0   |
| TIN                                |     |         |         |
| Straits, .....                     | ton | 97 10 0 | 0 0 0   |
| Australian, .....                  | ton | 97 10 0 | 0 0 0   |
| English ingots, .....              | ton | 102 0 0 | 0 0 0   |
| ZINC                               |     |         |         |
| English sheet, .....               | ton | 19 10 0 | 20 10 0 |

OILS.

|                               |        |         |         |
|-------------------------------|--------|---------|---------|
| Linseed, .....                | ton    | 18 5 0  | 18 10 0 |
| Cocanut, Ceylon, .....        | ton    | 24 10 0 | 24 0 0  |
| Ceylon, .....                 | ton    | 23 0 0  | 23 10 0 |
| Palm, Lagos, .....            | ton    | 21 0 0  | 0 0 0   |
| Rapeseed, English pale, ..... | ton    | 26 5 0  | 26 10 0 |
| brown, .....                  | ton    | 25 0 0  | 25 5 0  |
| Cottonseed, refined, .....    | ton    | 20 15 0 | 21 0 0  |
| Tallow and Oleine, .....      | ton    | 25 0 0  | 45 0 0  |
| Lubricating, U.S., .....      | ton    | 4 0 0   | 8 0 0   |
| refined, .....                | ton    | 7 0 0   | 12 0 0  |
| TERPENTINE—                   |        |         |         |
| American, in casks, .....     | cwt.   | 1 8 0   | 0 0 0   |
| TAR                           |        |         |         |
| Stockholm, .....              | barrel | 0 16 0  | 0 16 6  |
| Archangel, .....              | barrel | 0 10 0  | 0 10 6  |

CONTRACTS.

Epitome of Advertisements in this Number.

| Nature of Work, or Materials.                                                                                                               | By whom required.                          | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------|--------------------------|-------|
| Repairing Carriageways .....                                                                                                                | St. Luke's (Midx.) Ves.                    | Official .....                    | Sept. 11th               | ii.   |
| Broken Granite .....                                                                                                                        | East Ham Local Board                       | W. H. Savage .....                | do.                      | ii.   |
| Road-Making and Paving Works .....                                                                                                          | Higginson's Vestry .....                   | H. Mair .....                     | Sept. 12th               | ii.   |
| Blue Guernsey Granite Spalls .....                                                                                                          | West Ham Union .....                       | Official .....                    | do.                      | ii.   |
| Paving Works .....                                                                                                                          | Vestry of St. Giles, Camberwell .....      | do.                               | Sept. 17th               | x.    |
| Repairs, Alterations, &c., to Town-hall .....                                                                                               | St. Leonard, Shoreditch, Vestry .....      | do.                               | Sept. 19th               | ix.   |
| Two Residences, Finchley .....                                                                                                              | C. A. Mackness, Esq., Fulham Vestry .....  | E. W. Brooking .....              | Sept. 19th               | ix.   |
| Road-making and Paving Works .....                                                                                                          | do.                                        | J. P. Nerrington .....            | do.                      | ix.   |
| Stables, House, and Office, &c., .....                                                                                                      | Greenwich Brd. of Wrks .....               | Official .....                    | do.                      | x.    |
| Smiths', Engineers', and Ironmongers' Work .....                                                                                            | do.                                        | do.                               | do.                      | x.    |
| Carbolic Powder and Liquid .....                                                                                                            | do.                                        | do.                               | do.                      | x.    |
| Enlargement—Wolverhampton Post Office .....                                                                                                 | Com. of H.M. Works .....                   | do.                               | Sept. 20th               | ii.   |
| Broken Granite and Flints .....                                                                                                             | St. Matthew's, Bethnal Green, Vestry ..... | F. W. Barratt .....               | do.                      | ix.   |
| Sewerage Works .....                                                                                                                        | Edmonton Local Board .....                 | J. E. Eachus .....                | Sept. 25th               | x.    |
| Road-Making Works .....                                                                                                                     | Tottenham Local Board .....                | J. E. Worth .....                 | do.                      | x.    |
| Extension of Sewer, for residence for Mr. W. G. Scott, Augustus-road, Eighbaston. Mr. J. A. Chatwin, architect, Temple-street, Birmingham:— | Brighton Sewer Board .....                 | P. C. Lockwood .....              | Oct. 1st                 | x.    |
| Heavy Hoop, Birmingham (accepted) .....                                                                                                     | Met. Board of Works .....                  | Official .....                    | Oct. 2nd                 | ix.   |
| Enlargement, &c., of Board Schools .....                                                                                                    | School Bld. for London .....               | do.                               | Not stated...            | ix.   |
| Extension of Warming Works .....                                                                                                            | do.                                        | do.                               | do.                      | ix.   |
| Enlargement, &c., of Board Schools .....                                                                                                    | do.                                        | do.                               | do.                      | ix.   |
| Detached Houses, Tumbidge Wells .....                                                                                                       | do.                                        | W. B. Hughes .....                | do.                      | ix.   |

TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                                                                          |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| BIRMINGHAM.—For providing and fixing hot-water heating apparatus for residence for Mr. W. G. Scott, Augustus-road, Eighbaston. Mr. J. A. Chatwin, architect, Temple-street, Birmingham:— | £102 0 0 |
| Heavy Hoop, Birmingham (accepted) .....                                                                                                                                                  | £102 0 0 |
| Enlargement and ornamental coal-cases extra.]                                                                                                                                            |          |
| CRAYEN ARMS (Salop).—For new dwelling-house, &c., for Mr. C. H. Kynaston, Wem. Mr. W. T. Mathews, architect, Shrewsbury:—                                                                |          |
| J. Williams, Knighton .....                                                                                                                                                              | £815 0 0 |
| Wesle & Co., Ludlow .....                                                                                                                                                                | 515 0 0  |
| C. T. Smith, Broseley .....                                                                                                                                                              | 479 0 0  |
| H. Barker, Onibury .....                                                                                                                                                                 | 433 8 0  |

ENFIELD.—For the erection of residence, Turkey-street, Enfield, for Mr. H. O. B. Bowles, Mr. C. S. Robertson, architect, Finsbury-pavement:—  
Linsell, Tottenham .....

|                                                                                                                           |            |
|---------------------------------------------------------------------------------------------------------------------------|------------|
| Linsell, Tottenham .....                                                                                                  | £1,300 0 0 |
| L. & W. D. Fatman, Enfield .....                                                                                          | 1,194 0 0  |
| John Brooks (late Brooks & Madder), Enfield .....                                                                         | 1,159 0 0  |
| KENILWORTH.—For providing and fixing a hot-water heating apparatus at St. John's Church, Kenilworth:—                     |            |
| Henry Hope, Birmingham (accepted) .....                                                                                   | £2198 0 0  |
| LONDON.—For shop-front and alterations to No. 11, Buckingham Palace-road, S.W. Mr. A. W. Saville, architect, 56, Strand:— |            |
| Drew & Cadman .....                                                                                                       | £291 0 0   |
| Ward & Lambie .....                                                                                                       | 223 0 0    |
| Spencer & Co. .....                                                                                                       | 224 0 0    |
| S. Yardley & Sons (accepted) .....                                                                                        | 224 0 0    |



HACKNEY. For painting the several blocks of the Hackney Union and Infirmary. Mr. W. Barnett, Winchester House, Old Broad-street, architect:—

|                          |            |
|--------------------------|------------|
| Major .....              | £1,100 0 0 |
| Rowley .....             | 1,016 0 0  |
| Smith .....              | 891 0 0    |
| Savage .....             | 890 0 0    |
| Lane .....               | 829 0 0    |
| White .....              | 810 0 0    |
| Gilbey .....             | 786 0 0    |
| Wicks .....              | 700 0 0    |
| Wright .....             | 694 0 0    |
| Burke .....              | 683 0 0    |
| Richards .....           | 618 0 0    |
| Weller .....             | 639 0 0    |
| Henderson .....          | 633 0 0    |
| Wychie .....             | 626 0 0    |
| Porter .....             | 613 0 0    |
| Mackey .....             | 612 0 0    |
| Sherwood .....           | 608 0 0    |
| Wilmet .....             | 607 0 0    |
| Chillingworth .....      | 606 0 0    |
| Howard .....             | 601 0 0    |
| Booth .....              | 591 0 0    |
| Nye .....                | 574 0 0    |
| G. Barker .....          | 570 0 0    |
| Vigor .....              | 557 0 0    |
| Shore .....              | 557 0 0    |
| Allard .....             | 516 0 0    |
| Edwards .....            | 512 0 0    |
| Fuller .....             | 479 0 0    |
| Oswald .....             | 454 0 0    |
| Wright .....             | 430 0 0    |
| Mullett (accepted) ..... | 407 0 0    |

LONDON.—For alterations and additions at the South-Eastern Ambulance Station, New Cross-road, for the Metropolitan Asylums Board. Mr. Thos. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:—

|                                 |            |
|---------------------------------|------------|
| W. & B. Bardell .....           | £7,582 0 0 |
| Staines & Son .....             | 7,354 0 0  |
| Brown, Son, & Co. ....          | 6,990 0 0  |
| T. Simpson .....                | 6,900 0 0  |
| W. Brans & Son .....            | 6,799 0 0  |
| Wall Bros. ....                 | 6,747 0 0  |
| Ward, Clarke, & Co. ....        | 6,579 0 0  |
| W. J. Sawyer .....              | 6,446 0 0  |
| W. Johnson (accepted) ..        | 6,330 0 0  |
| G. Stephenson .....             | 6,200 0 0  |
| J. O. Richardson (withdrawn) .. | 4,940 0 0  |

LONDON.—For the works required in alterations and additions to Nos. 107 and 108, Cheyne Walk, Chelsea, for Mr. F. Cole

|                                                 |            |
|-------------------------------------------------|------------|
| E. Woodhouse, Woodford .....                    | £1,376 0 0 |
| H. Hollingsworth, Peckham .....                 | 1,260 0 0  |
| J. Poulton, Euston-road .....                   | 1,160 0 0  |
| F. J. Wicks, Willesden Park .....               | 1,125 0 0  |
| Newton & Co., Clapham Common .....              | 1,087 0 0  |
| W. J. Richardson, Lavender Hill .....           | 1,040 0 0  |
| A. Brickell, West Kensington .....              | 993 0 0    |
| R. & H. Bryon, 259, Fulham-road .....           | 950 0 0    |
| A. Cole, Kilburn .....                          | 870 0 0    |
| C. Beach, Brondesbury .....                     | 862 0 0    |
| A. R. Flew & Co., West Kensington Gardens ..... | 829 0 0    |
| R. Cox, Battersea .....                         | 795 0 0    |
| Child & Co., Pond-place, Chelsea .....          | 788 0 0    |
| F. Blanford, Highbury .....                     | 595 0 0    |

LONDON.—For new roof and sundry alterations at "Dorset Works," East-road, City-road, for Messrs. Dorrige Bros. Mr. A. G. Collins, architect, 30, Finsbury-pavement:—

|                                                              |          |
|--------------------------------------------------------------|----------|
| T. Nixon .....                                               | £337 0 0 |
| H. J. Williams, 18, Bermondsey-street, S.E. (accepted) ..... | 317 10 0 |

LONDON.—For painting and decorating work in dining-room, at 80, Cornwall-gardens, S.W., for Mr. Frederic H. Haworth:—

|                                                                    |          |
|--------------------------------------------------------------------|----------|
| Godfrey Giles & Co., 19, Old Cavendish-street, W. (accepted) ..... | £121 0 0 |
|--------------------------------------------------------------------|----------|

LONDON.—For taking down and rebuilding three shops and screen factory, adjoining the Grand Theatre, Islington, for Mr. C. Wilmet, Mr. C. Bell, architect, 3, Salter's Hall-court, Cannon-street, E.C. Quantities by Mr. W. Heals, 26, Budge-row, Cannon-street, E.C.:—

|                  |            |
|------------------|------------|
| Paine Bros. .... | £3,500 0 0 |
| Sharp .....      | 2,970 0 0  |
| Veale .....      | 2,919 0 0  |

\* Accepted subject to a reduction. [Other names and amounts as per full list given last week.]

LONDON.—For shop-front and interior fittings at No. 163, High-street, Stoke Newington, N., for Mr. A. Amiden:—

|                                    |          |
|------------------------------------|----------|
| S. Yardley & Sons (accepted) ..... | £270 0 0 |
|------------------------------------|----------|

LONDON.—For painter's work at the "York Hotel,"

|                                  |           |
|----------------------------------|-----------|
| Waterloo-road:—                  |           |
| Edwards .....                    | £189 10 0 |
| Watts .....                      | 186 7 0   |
| Pringle .....                    | 184 0 0   |
| Sanders .....                    | 180 0 0   |
| Helling .....                    | 160 0 0   |
| Buckley & Beach (accepted) ..... | 154 0 0   |

NEW ROMNEY (Kent).—For additions to National Schools, New Romney, Kent. Mr. J. Downsbrough, architect, Bexhill-on-Sea:—

|                                           |           |
|-------------------------------------------|-----------|
| W. Tournay, Hythe .....                   | £415 17 6 |
| C. Hughes, Bexhill .....                  | 385 0 0   |
| Potter, Stanning, & Co., New Romney ..... | 335 8 0   |
| W. J. Hainell, Lydd .....                 | 285 0 0   |
| A. Hutchinson .....                       | 279 0 0   |
| Pearson's Executors, New Romney .....     | 271 0 0   |
| J. E. Hughes, Ashford .....               | 267 9 0   |
| Samuel Woodley, Littlestone .....         | 254 0 0   |
| * Accepted.                               |           |

WANDSWORTH.—For repairs, painting, and sanitary works to the "Old Blo-Block Wards," at the Infirmary, St. John's Hill, for the Guardians of the Poor of the Wandsworth and Clapham Union. Mr. T. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street, E.C.:—

|                             |           |
|-----------------------------|-----------|
| W. W. Hammond .....         | £300 0 0  |
| J. Mills .....              | 1,190 0 0 |
| W. & J. Bardell .....       | 1,111 0 0 |
| M. Marsland .....           | 1,069 0 0 |
| J. Hole .....               | 1,056 0 0 |
| Turtle & Appletton .....    | 1,075 0 0 |
| W. Johnson (accepted) ..... | 1,065 0 0 |
| J. Edmunds .....            | 964 0 0   |
| G. Marsh (withdrawn) .....  | 679 0 0   |

Shop, &c., High-street, Islington. Messrs. Paine Bros., of Varsity-road, Stamford-hill, write to say that their tender for the erection of shop and premises for Mrs. Bland, in High-street, Islington, was 1,900l., not 1,890l., as printed. The list was printed as we received it.

#### TO CORRESPONDENTS.

R. F. C.—J. N. (we cannot return to the subject now).—G. H.—W. B. D.—C. F. M.—J. M.—W. B. (letter not suitable for our columns).—W. H. T.—J. O. M. (letter not suitable for our columns).—C. I. & Co. (your MS. is illegible). All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for our use, are NOT DELETED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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M. STODART & CO., Office:—

No. 90, Cannon-street, E.C. [Ad.]

SPRAGUE & CO.,

PHOTOGRAPHIC, 22, Martin's-lane,

Cannon-street, E.C. [Ad.]

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GENTLEMEN.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting powers your Strong-room doors and the Safes.

The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new building now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) WILLIAM WHITELEY.

Office and Warehouse: 76, CHEAPSIDE, London; Manufactory, Wharfedale Works, Arlington-street, London, N.

WILLIAM WHITELEY, Westbourne Grove,

London, Oct. 12th, 1887.



# The Builder.

Vol. LV. No. 2380.

SATURDAY, SEPTEMBER 15, 1888.

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| The Thiergärtner Thor, Nuremberg.—From a Sketch by Mr. Frank T. Verity .....                   | Single-Page Ink-Photo.         |
| The Hull and Seaford Dispensary.—Messrs. Botterill, Son, & Bilson, Architects .....            | Single-Page Photo-Litho.       |
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### Glasgow Drainage and the Pollution of the Clyde.



THE combined question of town sewage and rivers pollution is one which in the Clyde Valley, as in many other centres, becomes periodically agitated, with corresponding intervals of quietude. It may be described as in the eruptive phase at present, but so far the discharges,—although in a kind of way,—have scarcely as yet reached a phenomenal stage of intensity. The dredgings of Glasgow Harbour and of the deepened river generally have for years been disposed of by dropping them into the deep water of the estuary, where it opens northward into Loch Long. Some considerable time ago complaint waxed loud and incessant concerning the alleged pollution of the once stainless tide of sea water at this spot, and the outcry did much to reawaken the question as a whole; but other agitating influences have been at work too. There have been prosecutions, under the existing Acts, for the fouling of streams in Scotland,—prosecutions which have borne some little fruit of a stunted kind, and in several instances official inquiry has been astir. The belief has been gaining ground that at length some movement is to be made, other than letting loose a volume of talk or passing inoperative Acts of Parliament. Recently there was an official inquiry into the Loch Long grievance, followed by a report which, although cautious, and in part inconsequential, sufficiently justified the action of the complainers and shook the calculations of the opposite party. Hence the gradual reopening of the general question in the great city of Glasgow, which, in its formidable sewage problem, as well as in other less repulsive features, ranges, though a long way to the rear, of course, as the nearest second to London. Glasgow, within its tenements and under its streets, is essentially a city of water-borne sewage,—a system long vigorously decried and as warmly commended, and still on its trial. An early report (1858), at a period when the water-closets of Glasgow were comparatively few, spoke confidently of the water-closet system as "quite behind the age." Thirty years have since passed; the water-closet institution has grown enormously in Glasgow, and,

whether it is quite behind the age or not, there is certainly even now no other rival system which may be confidently described as in front of the age, or abreast of the age, for that matter. It is still the age of experiment all over the field. Pipe connexions between sewer mains and the interior of dwelling-houses unquestionably suggest incipient and most dangerous invasion on the part of sewer gas, but much may be done to make these connexions gas-tight, and it is on this object, of late years, that the watchfulness of the sanitary staff of Glasgow has been sedulously concentrated. Probably in no city in the world are the sanitary regulations so exacting, or so ruthlessly carried out. The owner of a tenement may be on the verge of ruin financially, but his drains, if reported on unfavourably, must be put right. Here there can be no question whether a property is overburdened or not; the official is instructed to shut his eyes entirely to the financial circumstances of the owner, and he does it. Not very many years ago sewer gas crept into Glasgow houses wholesale, and made victims in corresponding ratio; but of late, although water-closets have increased immensely, the death-rate has decreased. The credit of turning the flank of the insidious enemy must be set down, therefore, to a growing official watchfulness, aided by an abundant service of water, especially since the felicitous bringing-in of Loch Katrine.

Reference has been made to a thirty-years-old report on the drainage of Glasgow. This was not by any means the first of a numerous race. Of sewage deputations, inquiries, and reports, from first to last, Glasgow has certainly had more than enough. It has been dosed and stupefied, so far as the natural hardness of its head would permit, with sewage prescriptions, in concurrent terms often flatly contradictory, and generally in tones of the utmost conviction. The skilled report of 1858 wisely stepped out by warning those administratively concerned that the problem of ridding a large town of its sewage did not admit of an economic solution; and yet even now there are enthusiasts who swear vehemently that in city sewage rationally treated,—that is, treated as they would direct,—there is wealth untold. At that time, the Kelvin, a tributary of the Clyde at Glasgow, was a foul stream, as it is now, and it formed a part of the design of the two reporters (a professor of chemistry, Glasgow University, and an eminent London engineer) to deodorise the whole of its passing volume as

an educative experiment, and keep it in that condition by constant treatment for the space of a few weeks. The deodoriser held in readiness for this treatment was a blend of sulphurous acid and carbolic acid, but the season turned out so wet, and the Kelvin was so frequently in flood that summer, that it smelt little or not at all,—conditions which, happily for the amenities of the Glasgow Exhibition so far, have been pretty closely paralleled this year. The interesting test was to be carried out on the following summer, however,—at all events, on the next dry summer; but by the time coalescing heats and droughts once more restored the stream to its normal offensiveness, the sewage agitation in Glasgow had rounded into the quiescent stage of its periodicity, and nothing was done, nor has anything of the kind been done to this day. At one period a deputation from the Town Council scoured the Midlands of England in quest of broader insight concerning the disposal of sewage; but the excessively hard conditions of low-lying inland English towns differ so greatly from the more favourable watershed surroundings of Glasgow that this trouble might well have been spared. Its main outcome was the importation upon the attention of Glasgow of a whole phalanx of individual conceits or fads. The system mainly at that time in vogue at Manchester and Birmingham caught some fancies, and Glasgow was recommended to adopt the tub-and-pail plan of removal; the earth-closet method was thought costly to an impracticable degree; but Lierneur's system (central treatment by a drying heat, and theoretical result a marketable "poudrette") was looked to hopefully; water-closets in large works and institutions, and also in small houses, ought to be abolished as a beginning, and ordinary privies should be converted to the tub-and-pail mode. Much of the advice emanating from this deputation was given in light-hearted, off-hand style. If forced to purify the Clyde and keep it clean, why, cleanse the sewage liquids by precipitation and filtration at some suitable point in the neighbourhood of the city, and there you are! Run your cleansed liquid into the Clyde, and get rid of your sludge as best you may,—sell it if you can, or make up waste land with it if you can't. Another of the City's sanitary advisers pronounces all precipitation methods imperfect, performing lip service mainly, and effecting only a deceptive cleansing of the liquids; while a third waves away the liquid difficulty as non-existent, but is brought up



stock-still by the problem involved in the disposal of the precipitated sludge. That, he admits, is incapable of a satisfactory adjustment. There might be a feebly-fifful demand for a brief portion of the year, but this would not suit the book of a steady production susceptible of control only by as steady a dispersion. Opinions on irrigation, or sewage farming, have been as wildly conflicting. The method has been denounced on high authority as most offensive to the senses over widespread areas, and grossly unnatural in the treatment which it accords to the unhappy land operated upon. The soil is surfeited and sickened with excess of manurial ingredients, thrust upon it in season and out of season, and cannot possibly bear a healthy vegetation; municipalities relying on sewage farming may dream of a profit, but will do so vainly; the sewage farmer himself need look for no more than the barest living. On the other hand, sewage farms have been extolled as next door to perfection, and notably so on quite a recent occasion, at the annual congress of the British Medical Association, this year convened in Glasgow, when Dr. Drysdale, of London, and Dr. Carpenter, of Croydon, called upon London, Dublin, Liverpool, Glasgow, and all water-closet towns, to follow the example of Berlin, Paris, Birmingham, Croydon, and others, where it is alleged the farming system has proved a success.

Twelve years ago the sewage reform agitation came to an apparent climax in Glasgow, as elsewhere, on the passing of the Rivers Pollution Act, after nearly twenty years of trifling with the subject in Parliament. All river-befouling municipalities, with Glasgow specially included, believed that doom was at last upon them, and more earnest and louder still grew the cry for sewage remedies. But the Act of 1876, heralded with so imposing an air of business, proved but a toothless dog; defaulting drainage areas, to their surprise, found it almost perfectly "harmless," and things gradually made up their minds to go on as before. It contained no clause for the formation of independent Boards of Water-course Conservancy—a special recommendation of the several Parliamentary reports on which the Act was founded;—it was a Court without stated judge or executive; in short, it had neglected to ordain the machinery necessary for the enforcement of its own provisions. Glasgow, like the rest, quickly recovered itself so far, and continued in its ill-doing, if not altogether with a mind at ease, at least with no dread of immediate consequences. But for all that, there is the writing on the wall against the unbridled pollution of streams, and now that Loch Long may not be much longer retained as a convenient depot for the dredged sewage deposits and other accumulating sedimentary matter of the Clyde, and the City is on the eve of an important enlargement of its municipal area, this very stiff bit of necessary reform must soon be faced.

Clyde drainage conditions, while similar generally to those of the Thames, differ very materially in detail, and it is delusive for the Glasgow authorities simply to wait on the Providence of any series of London experiments. The Thames in its tidal reaches is a lively river, with a range of 18 ft. between the top and bottom of its tides, and a current velocity of two and three-quarter miles an hour on the average ebb; while the Clyde is a sluggish stream, with a crawl of only two and a quarter furlongs on the ebb tide, and a range between rise and fall limited to 9 ft. 9 in. Test-floats put in at the Upper City Bridge a little before the top of high water, a day or two in advance of the highest spring tides, and with the Clyde in ordinary moderate volume, have pointed the way to some curious results. It was proved by these tests that floatable sewage entering the river at Victoria Bridge under similar conditions took a week to get down to Govan Ferry, a distance of two and a-quarter miles, but still within city bounds; fourteen days to make the mouth of the Cart, near Renfrew, and a month to reach Dumbarton; the denser portions settling down upon the bed of the river meanwhile, the

thorough deepening of which has undoubtedly aggravated this lack of tidal activity, and in no small degree tended to transform it into a kind of settling-trough for the heavier of the temporarily suspended sewage impurities. According to Sir John Hawkshaw, the watershed of the Clyde basin, placing the seaward limit at Gourock, three miles below Greenock, extends to 1,481 square miles. It supplies three tidal tributaries to the main waterway, viz., the Leven at Dumbarton, with the surplus of Loch Lomond; the Cart from Paisley, and the Kelvin at Glasgow; the latter, however, a tidal stream for a few furlongs only.

Above Glasgow the Clyde, itself not of great volume, receives five or six affluents, including the three Calders, the Avon, and the Nethan. It is a comparatively pure stream for a considerable portion of its upper course, and it is lively of habit as compared with the languor of its tidal section, breaking into several falls and rapids as it swiftly threads its way to the lower levels. Samples taken a little above Glasgow show that the river water, even in dry weather, is not greatly contaminated by the various fouling influences up the stream. Specimens drawn from the river in flood, after heavy rains in the Upper Ward of Lanarkshire, give about 15 grains of sedimentary matter, composed chiefly of finely-divided clay, with trifling proportions of oxide of iron, lime, magnesia, and organic ingredients. Directly the harbour of Glasgow is entered, deterioration increases at alarming speed, and at once the Clyde becomes a black, sullen, stinking flood, with, in summer, a continuous commotion in its depths and on its surface, through the struggling of the gases for freedom, these rising in incessant bubbles from the grosser filth below. Steam-boat boilers are not particular as to the purity of the water they use, but here it is so unutterably foul that the small craft which ply on the harbour have to be watered from the shore. Eleven miles below Glasgow, at the top of ordinary tides, fresh water and sea water are found mixed in equal proportions; at half ebb the point of equality is two miles farther to seaward; at dead low water here, the proportion of salt is one-fourth only, and there is no appreciable saline infusion higher up than nine miles below Glasgow Bridge. The downward run of the Clyde at Glasgow in moderately dry weather has been estimated at 48,000 cubic feet per minute. It is difficult to estimate the volume of sewage and surface drainage which is here added with so little ceremony, but it is probably considerably in excess of one-eighth of the whole, and it must be remembered that the addition takes place within a stretch of barely three miles. The condition of the Clyde after this treatment is abominable in the extreme, as may readily be imagined, yet it does not appear to propagate any special type of zymotic or other disease, even although at times the stench may be encountered in a form so concentrated as to act as an emetic. The sewage of Glasgow is collected into one set of main conduits, or gatheralls, and these, without chemical or mechanical treatment of any kind, take severally the shortest cut to the harbour (which is simply the river-course deepened), and discharge there amongst the shipping. The water-closet system is not quite universal, but it is in an overpowering preponderance, and has been constantly extending for years. What is termed the "pan privy" is in use to a considerable extent on old or smaller graded properties. The earth-closet is known, but, rightly or wrongly, the official sanitary eye regards it disdainfully, as quite unsuited for general adoption where large-scale operations have to be coped with. The city and outskirts abound in manufactories, the greater proportion of which pour their liquid refuse into the sewers; about thirty discharge into the Clyde direct.

Every known contrivance in the way of sewage disposal has from time to time been under the consideration of the authorities of Glasgow. The formation of an amalgamated drainage area for the whole of the Clyde valley has been spoken of, as already hinted, and very likely would by this time have been realised in some shape, if the Act of

1876 had been worth half the trouble it cost or one-fourth the useless flurry it raised. If it is, Glasgow has been in the habit of concentrating its speculations upon its own individual case, with more than half an eye to the suburban burghs, which have looked tempting for annexation, and are not considered very nearly ripe for that operation. Sir John Hawkshaw's plan was to lead off sewage, in pipe or in tunnel, thirty miles southward to the Ayrshire coast. Messrs. Bateman and Bazalgette also reported early in favour of a similar coast plan. Mr. Bateman, in 1878, reviewed foregoing speculation and proposals, and at the request of the Council tabled three new schemes, with estimates to meet the prospective growth of Glasgow up to an extreme, bordering on a population of a million and a-half. They took the shape of congregating the whole of the city sewage at one or two points on the banks of the Clyde a few miles below the city, there to be treated, might afterwards be decided on, a governing general idea consisting in a sufficient cleansing of the liquids for discharge into the Clyde, and disposal of the residuum in the best way possible,—sinking it at the mouth of Loch Long being, at that time and immediately, confidently held in reserve as a sure and certain final alternative. Mr. Bateman did not conceal his doubts as to the partiality of a cleansed liquid remaining harmless more than a limited period after being consigned to the river; but a local chemical authority subsequently opined that not only would the liquid after sufficient treatment by lime and sulphate of alumina, remain harmless, but that it might be run off at all times of tide, and at a point much nearer the city than that proposed in the scheme. Neither had this authority any serious misgivings as touching the disposal of the residuary sludge; the low tide shores of the Clyde might be "made up" with it; it might be sent by rail to improve mosses and sandy wastes inland; or, again, if not better, it might be "hoppered" to the mouth of Loch Long, and there sent to the deep bottom of the firth. Of other less orthodox proposals there have been plenty. The Town Council, as a partial measure, at one time thought of constructing an upper level intercepting main drain to some such operating tank or reservoir as that implied in Mr. Bateman's suggestion, leaving the lower level to drain into the Clyde as of old; but their consulting engineer warned them against any tinkering of the sort, as but the gateway to trouble and expense incalculable. And no doubt he was right. A member of the Council pleaded strongly for a complete revolution in the house sewer-pipe and main drains of the city, whereby the sewage matter would be classed *ab initio* into (1) Rainfall and house-slops; (2) Manufacturing refuse; and (3) Soil-pipe and urinal accumulations. The first-class, as comparatively untainted, might find its way into the river by existing conduits; the second by new culverts to settling-ponds fifteen miles down the Clyde; and the third class (also by a new set of conduits) to convenient depots near the city, and there turned into no end of revenue. But the technically-instructed mind could not look kindly on this, and after a report by the Master of Works representing the huge original capital and annual outlay that would be entailed, and adverting to the very dubious prospect of anything but trouble from the accumulations of excreta, it was quashed. Another Utopian project was to collect all the sewage matters in one depot at short distance up the Clyde valley, there draw off its bad gases into the upper atmosphere, and after purification by precipitation and infiltration, and particularly by mechanical aeration, dispose of the liquid for manufacturing purposes partly, and run the rest into the Clyde through turbines, which would thus be made to supply a large portion of the pumping and other power involved in the scheme. Here, again, it would appear the residuary sludge was to be consigned to the Loch Long receptacle, in barges passing through the city. This project also (in the author's elucidation of which there lurked some



gestion of the vein of Jules Verne) was finally reported on,—and laid aside. The report said that as a scheme it differed from all others. He had never seen anything like it. Of course the sewage-farm (for which a number of years ago, when the city was smaller, it was reckoned to quite ten square miles of land would be necessary) has been under consideration, but never was at any time the least bit of it in the contemplation.

It may be taken for granted at this time of day that Glasgow sewage, in its travels within the city, is to remain water-borne to the end of the chapter. The fight with sewerage, the chief bane of the system, is being fought to the death, and increasing knowledge and fresh expedients yearly strengthen the hands of those who have undertaken the warfare. Sewer gas is a foe to reckon with; but in Glasgow it is by no means the daily agent it once was, and it may be accepted that the wholesale sealing up of the interior of dwellings against its insidious entrance is not beyond the stretch of ordinary engineering skill in Glasgow, aided by a plentiful tide of Loch Katrine water with which to keep up a constant flushing operation, and ensure the prompt carrying away of all putrescible matters; and given, too, of course, the requisite yearly and daily care, and an ungrudging yet not extravagant outlay of money for needful repairs. Here is, however, still the question of the ultimate disposal of sewage. Simply turning it into the Clyde may not much longer be in vogue. Two general methods stand out in the line of adoption. The sewage may be manured locally, giving to the Clyde the solid portion after a purification that will satisfy the rivers preservation authorities of the future, and getting rid of the solid residue at as small a cost as possible consistent with freedom from any fresh form of nuisance. Or, the native sewage may be sent directly to the outer sea, as long ago proposed; and certainly, now as formerly, this is the alternative which of the two is the more magnetic in its action upon the public mind. The cost of sea outfall works will, no doubt, be very heavy, at Glasgow, and other places of like circumstances with it, may make up their minds at the sewage problem is not to be solved cheaply, however it be taken in hand; and they will do well also to bear in recollection that possibly the scheme which seems most likely for economy at a short view, may run up by far the heaviest bill in the long run. Were the entire watershed of the Clyde turned into one drainage area administered by one comprehensive territorial council, the outer sea conduits might to most advantage, perhaps, be made to follow the outflowing shore lines of river and firth, the sewage of each village and town being brought up in passing. If Glasgow has to go to work on the restricted basis of its own requirements, it would naturally strike direct for the broad lower estuary through the bunties of Renfrew and Ayr, probably making partnership on the way with the large town of Paisley. Heavy pumping machinery and stupendous engineering works will be entailed, whatever mode of disposal adopted, and in going to the sea a nice question will arise on the manner and position of the ocean outfall. It might be possible to carry that far enough out to safeguard the inshore waters entirely from nuisance; but, no doubt, in proportion to the offering attained, the cost would be enormously increased. Objectors to the sea method of disposal point out that, however capacious might be the sewage conduit constructed, it would be liable to collapse during some exceptionally extended downpour of rain, therein assuming that under no conditions whatever might any excess of volume be temporarily diverted into the ancient natural receptacle passing through the city. This is a creeping pessimism too far. No theorist, however much of a stickler he might be, would ever contemplate closing the Clyde, or any other river, absolutely against any such rare and comparatively harmless

overflow as this would represent. Of course, in angling for some sovereign remedy, the wholesale agency of chemicals has been looked to most hopefully by a few; but there is a strong conviction in Glasgow, as elsewhere, that the deliverance of Sir Henry Roscoe, in a recent report to the Metropolitan Board of Works, London, on the more stupendous metropolitan sewage difficulty, is a sound deliverance, viz., that the use of chemicals of any kind for the treatment of heavy aggregations of sewage must be considered as only a temporary expedient.

#### THE SCHOOL BOARD WORKS COMMITTEE.



I presume it is partly in emulation of the Board of Works that the School Board for London must needs have its Special Committee for the discovery of malpractices in connexion with the Works Department, the proceedings of which are now issued in a volume of about 350 folio pages of questions and answers, the extent and solemnity of which appear somewhat ludicrously out of proportion to the comparatively unimportant nature of the disclosures arrived at after all this fuss; and if economy was the object and end of the inquiry, it might be a pertinent question for some economical member to put, what has been the expense of all this printing and reporting, which, by the way, seems to be badly done and full of obvious inaccuracies and obscurities? In many cases, indeed, it is difficult to understand what the questions and answers, as here reported, really meant. The substance of what has been elicited may be said to amount to this; that the former Architect to the Board, Mr. Robson, was supposed to look after more than any one man could possibly have looked after, and was very badly paid for doing it; that he was obliged to rely a great deal on the reports of subordinates, and that in a few cases he was misled thereby, and was rather too confident, and that some bad work was done here and there for which he was officially and nominally responsible, but which it was next to impossible that he could have personally seen to. The report, however, contains a good deal of more or less interesting, and at times even amusing, reading.

The voluminous evidence given by Mr. Robson during two or three sittings of the Committee\* presents a forcible picture of the high pressure under which the work of school building for London was carried on in the early years of the Board's existence. Mr. Robson gave a short historical sketch of the manner in which his department came into work, and his own peculiar position was developed. He was employed at first as a consulting and advising architect only, at a salary of 500*l.* a year, and the Board went into a series of competitions, about thirty in number, on all of which Mr. Robson advised and reported. Mr. Robson got tired of this, and said he must give it up—perhaps with some provision that the Board would not be very willing to part with him; at all events, it was then intimated to him that there was a desire that he should build the schools, and he proposed to do it on commission. That proposition was lost, and he was then offered 1,000*l.* a year, with the understanding that he should give the Board his first consideration, but not, as we believe was supposed in some quarters, that he should take no other private practice. For this 1,000*l.* a year Mr. Robson states in the evidence that for some time he was carrying out an amount of work by which, in ordinary practice, he would have made 25,000*l.* a year. There is some discount to be made from the comparison on two grounds; 1st, that he admits that the work was more than he could pretend to personally superintend; 2nd, that he had all the subordinate assistance found for him, and not at his own expense. In other respects

Mr. Robson's account of the work shows discrepancies; he speaks in one place of about fifty schools a year, and in another place of schools "at the rate of two a week," which latter seems to be an exaggeration. But in a general way, Mr. Robson's evidence gives a remarkable and, indeed, almost dramatic picture of the tremendous pressure of work going on during the time that he was architect to, as it appears to us, a very ungrateful Board. The whole thing seems to have been a constant drive to get through work somehow or other, and in as regular a way as possible, which it was almost impossible to get through in the time. The responsible architect to the Board was, as he says, "doing the work of six architects," and was carrying on a certain amount of private practice at the same time. Of course the natural comment would be that he should have relinquished the private practice, and any demand on his part for increase of salary was met by the counter demand that he should relinquish it; but we do not gather that the Board ever offered their architect any salary sufficient to compensate for that sacrifice. The main conclusion to be arrived at from the report, as far as the architect is concerned, is that he served the Board with remarkable skill and energy under most difficult circumstances and for very insufficient remuneration, and got through an amount of work, including not merely routine work but invention (for nearly every school built for the Board has its own plan and characteristics), which only great energy and resolution, coupled with exceptional powers of work, could have enabled any man to get through at all. It is a very poor return for all this that the architect should be invited to be badgered with cross-questioning by a Committee set on foot by members who are apparently anxious to earn a cheap reputation for economical policy.

The main point in which there has been an attempt to saddle the architect with responsibility for bad work appears to be in regard to the foundations of the Barnet-street Schools, the story about which rests mainly on the evidence of Mr. Nicol, the clerk of works, a gentleman who asserts that he was subjected to "persecution" for having discovered that the older portion of the school had not proper foundations. We do not see any evidence about the persecution, but Mr. Nicol's manner of giving evidence suggests the idea that he was a clerk of works desirous to magnify his office, and to make the worst of anything he might find wrong, and that he was not troubled with much reticence or modesty. Mr. Nicol, however, certainly made a couple of points. He reported the foundations defective, and they were defective, and had to be underpinned. It was "just about the time of the fall of the Tay bridge," and he "felt nervous," and our impression from comparing one part of the evidence with another would be that he exaggerated the state of the case. Mr. Robson appears to have depended on the report of his superintendent, Combe (now dead), who was appointed specially to relieve him from inspections which he could not possibly make in person, and who appears not to have been so trustworthy as he was supposed to be. Mr. Nicol's statement that he was "afraid of the building coming down about their ears" when orders were given to uncover part of the foundations, looks to us a good deal like a bit of dramatic effect. The one thing we do not understand in Mr. Robson's part in the matter is that he appears to have written to the clerk of works that he had "personally inspected" the foundations, and nothing was wrong. We cannot see any explanation of that "personally" unless it meant that his responsible superintendent had personally inspected them, which is not quite the same thing. Mr. Robson in his evidence, however, throws doubt upon the whole statement of the other witness, and asserts that he was a clerk of works who did not know his duty, "and was always fussing about things that did not concern him." The two statements of the witnesses are irreconcilable, and it is possible that Mr. Robson's memory was at fault; but, on the other hand, the animus

\* It should be noted that the Committee had no power to compel the attendance of witnesses; all those who gave evidence attended voluntarily.



in Mr. Nicol's evidence is pretty obvious, as well as the motive for it, as he had been rebuked by the architect for "want of practical knowledge and of common sense." We will, however, give Mr. Nicol's statement in his own words about another matter in which he claims to have caught the Architect's department tripping (he hardly pretends that he could throw the blame on the Architect himself):—

"1880. Mr. Helby: You had some trouble at Shepperton Road School?—What was that?  
The Witness: The superintendent clerk of the works was not very friendly on account of these things, and I felt it was not exactly the thing; and, before starting the job, I discovered a mistake in the plans. I told him that I had found a mistake in the plans. He said, 'What is it?' He was not very sharp in understanding plans, and I did not care to give him my brains, and I said, 'You find it out; you report the same to the architect.' He reported the same to the architect, and the architect sent back a message to me next day to say I was a fool, and to build according to plans.

1881. Mr. Barnes: Was that a verbal message?—Yes.

1882. Who brought that?—The superintendent clerk of the works. I said, 'Phahay, go on.' I said 'That will show itself when it comes to 15 foot high.' We built until it came to 15 feet high, and the men on the job laughed at it, because they thought it was the clerk of the works' fault, and that the builder's foreman had made a mistake. It was a double staircase: it was not exactly like the double staircase in this building, but when we came up, the last landing was only three feet above the landing below; consequently, nobody could get up to the top landing of all. Our schools were built 15 feet from ceiling to ceiling, and the top landing was only 3 feet away from the landing immediately under. Consequently, there was no possibility of anybody getting up without crawling up.

1883. Mr. Lobb: How high had you built it?—Fifteen feet—the staircase itself. I said to the foreman, 'Well, I will go to the office myself now.' I came down, and Mr. McFarlane asked me what I wanted. 'I want to see Mr. Robson; is he in?' 'No,' he said. 'What do you want?' 'I want to see him very particularly; I will not tell you.' 'Won't Mr. Bailey do?' 'I said, 'Perhaps Mr. Bailey will do.' Mr. Bailey asked me in, and he said 'Well, Nicol, what do you want?' 'Well, I have come down about that staircase at Shepperton-road.' 'We have heard something about that; there is nothing wrong with it?' I said, 'We have built it according to plan, and you will have to come and see it for yourself now.' I said, 'At least, there was a message sent up to me that I was a fool, and knew nothing at all about the staircase.' I said, 'We have built to the plans, and you had better come and see the building for yourself.' 'Well,' he says, 'What is wrong with it?' I said, 'Would you kindly pull out the plans?' He said, 'Yes; here they are.' I looked at the plans, took my pencil out. 'Give me a bit of paper,' I says. 'You see that building?' 'Yes; I do not see any mistake there.' But I drew a very rough section with the pencil. He said, 'Do you mean to say it has been built like that?' He said, 'The whole thing will have to come down.' I said, 'I knew that before I started, but I was a fool, and I was told to build to plans, and we built to plans.'

Mr. Robson, on being questioned about this, said he remembered nothing of the kind; that it was probably a builder's error, which had been corrected before he could know of it; and, as he says elsewhere, "the personal responsibility of the architect in such a position as this would mean that he would have to do the work of twenty men himself." However, if Mr. Nicol's account is accurate, it, no doubt, carries the moral: "Do not lightly refuse to investigate a clerk of works' complaint."

The description of the manner in which the specifications and quantities were got up tells of the same haste and struggle against time to which other evidence points:—

"2067. What was your practice with regard to the designing and building of schools? Did you yourself draft the specification?—No. The notes were made of the specification and it was then sent to the quantity surveyor. After a certain number of schools had been built, we got a standard set up in type which was altered to meet the requirements of each school. It was thought it would save both time and expense in printing.

2068. Were those alterations made by the architect or by the quantity surveyor?—By both. The notes had to be made in the first instance, sometimes verbally, and sometimes in writing, and then the quantity surveyor took it up, and in the process of measuring he would find certain things necessary to insert, and he would send it back with his emendations, and it would go to the printers to be set up.

2069. Were the alterations made before the quantities were prepared or subsequently?—The final

settling of the specification was after the quantities were prepared. The quantity surveyor then added his points. The object was, that the quantities and the specification should exactly agree, for I always hold that the quantities ought to be a part of the contract, and that was never so here.

2070. Who was responsible for seeing that the quantities and the specification agreed?—The quantity surveyor, of course.

2071. And if in any buildings it was shown that they did not agree, how far would the architect be responsible for that want of agreement?—I really do not know. The point has never come before me before."

On this kind of ground it is hardly surprising that quantity surveyors should begin to think they are practically the architects of the building. The system is one which must be excused on the ground of the struggle for time, but certainly not one which commends itself to us. Another passage which affords matter for comment is included in a question by Mr. Christian\* to Mr. Robson, and the reply to it:—

"2161. As to one of the practices which have been carried on, I should like to ask Mr. Robson a question, and that is, I find that almost all the work is pointed after it is finished. Whether it is done in cement or whether it is done in mortar, it is pointed in the case of gables and in the case of chimneys. I have seen there has been what they call the 'tuck pointing,'—which I think is an abomination,—done after the work is finished; and that is done to a very great extent, and, of course, in such a building as a Board-school, which is of very great height, it is a very serious matter. Why should not all the joints have been finished straight off?—Well, no one knows better than yourself, Mr. Christian, that the 'tuck pointing' is part of the style in which the schools are built, and the idea of 'tuck pointing' is that it is a thing that can be renewed at intervals of years, and make the building look fresh again.

2162. That I am quite aware of, but in the case of such buildings as these, you have got an outline of the style and all the general lines. Surely it would be more reasonable, considering that course of pointing [sic], to finish as you go on, even if you have to build in bad weather, and build all work which is out of general reach in cement. It appears to me that it would be a very serious matter as regards the cost of repair, and I think in a case of that kind I should have disregarded the style, and made the job an honest one at the beginning, Mr. Robson?—Pointed them in cement at first.

2163. I would have finished them.—You mean finish as you go along?

2164. Yes.—Many people advocate that. I do it in Gothic buildings.

2165. Then why should it not be in other buildings?—

To which latter question there seems to have been no answer; and we echo "Why, indeed?" And what can be the definition of "style" in which tuck pointing is regarded as "part of the style"? That is, indeed, a new definition of "style."

Other points against the Architect's department might be extracted, more or less colourably, from this voluminous book of evidence about trifles (mostly), but on the whole the impression left after reading the evidence is that it has been an unnecessary and got-up enquiry; that the School Board have had a great deal of talent and energy brought to bear upon the building of what are, on the whole, an admirable series of schools; that they have paid very little for it; and that they have not shown a very admirable or generous spirit in baiting with cross-examinations the men who have done their work under great difficulties; and some people may be inclined to suggest that possibly the near approach of election time at the School Board has had something to do with this display of economical ardour and incorruptibility on the part of some of the members.

**Greek Archaeological Treasures.**—A Danish archaeologist, writing from Athens, asserts that the Greek Government is taking the most active steps with a view to put a stop to the export of Greek art treasures, which takes place in spite of the law of 1843 to the contrary. The ports of Piræus, Nauplia, and Corinth are being closely watched, and even passengers' luggage is examined when suspected of containing archaeological treasures.

\* We presume that Mr. Christian and Mr. Rickman, whose names appear in the inquiry, were called in as professional advisers to the Committee. The Report gives no statement of their position, nor of the constitution of the Committee, or the sittings at the various sittings.

## NOTES.



**SEWERAGE scheme,** involving an expenditure of no less than 450,000*l.*, with an addition of 40,000*l.* for the purchase of land.

formed the subject of an inquiry which was opened in Manchester on Monday by Mr. Samuel Joseph Smith, C.E., on behalf of the Local Government Board. The Corporation propose to construct intercepting sewers for the city, and to carry the sewage by two principal sewers, of 7 ft. and 9 ft. in diameter to the city boundary in Stretford-road, from which point it will be taken by an outfall of 10 ft. 6 in. along Stretford-road to works near the Irwell. There the sewage will be dealt with in tanks which will be used for precipitation purposes, the effluent, on leaving the tanks, flowing over a weir, and being treated by the system of "downward intermittent filtration." The final destination of the effluent (calculated at 10,000,000 gallons per day) will be the Manchester Ship Canal, the Corporation being under an agreement with the Canal Company that the water shall not be injurious to the canal. The residuum of the sewage will be disposed of according to the Leeds method. The sewers are to be sufficient for a population of 500,000, and are to provide for rainfall as well as carrying away the sewage. The scheme is formally opposed by a number of Local Boards in the district, and also by over a hundred property-owners and occupiers.

IT is natural that daily newspaper criticism should felicitate Sir F. Bramwell on having, in the words of one journal, made the Presidential address of the British Association "intelligible to ordinary readers," and if the British Association were an institution for the popularisation of science, this praise would, no doubt, be much to the point. Sir F. Bramwell's address was certainly intelligible to any one, and formed a somewhat dramatic and occasionally humorous summary of the bearing of engineering and constructive improvements on the conduct of everyday life and occupation: but to our thinking something higher than this is to be looked for in the opening address of the British Association for the "Advancement of Science." The annual meetings of the Association tend to become more and more a kind of mere scientific amusement in the eyes of many of those who attend them, a form of mild dissipation; and however much this may be practically and unavoidably so in regard to a proportion of the audience, it is not desirable that Presidents of the Association should assist this tendency by reducing the Presidential address to a piece of popular gossip on some of the superficial aspects of science. The address in question was, no doubt, amusing to many of those who listened to it, but it was not calculated to maintain the status and dignity of the annual meetings of the Association, and we hope its character will not be taken as a precedent for future addresses.

THE paper read by Colonel Hazard at the British Association, of which we have received a copy in full, with illustrative diagrams, offers important, and we think in the main practicable, suggestions as to an improved system of underground railway conveyance for large cities. His system could hardly be applied except to streets which had been laid out and constructed with that special object in view, as the system involves a very compact arrangement of the space under the roadways in a city, and the utilisation of the space so as to provide properly for drainage and lighting on either side of, and without interference with, the railway routes. His proposal is to carry the roadway on iron columns and girders and steel decking, the section of the roadway being no thicker than is just requisite to get a good carriage-way, and beneath this to have a continuous trench, about 12 ft. deep, with a concrete flooring, on which would be laid four lines of rail, the two inner ones for express trains up and down between important points,



the two outer ones for slow-stopping trains similar to our present metropolitan railway trains. Outside these, again, would be continuous galleries for the laying of gas, water, drainage, pneumatic and steam pipes, and electric cables; the galleries accessible by entrances at various points, and all the nuisance of taking up the roadway being done away with. At double stations the fast trains are to be entered by platforms over the slow trains, the slow train road being sunk at these points, with down and up gradients. The trains to be driven by electric power. The author proposes that the trains should travel in tubes, to which they would act as "loose-fitting pistons," and would operate a system of ventilation by their own movement. This portion of the scheme we should feel very sceptical about; but the main idea is well worth consideration when the opportunity may occur; and the Paris authorities, who are so much exercised about a metropolitan railway for their city, might do well to pay attention to Col. Hazard's suggestions.

THE *Art Journal* for this month contains an article on old Boston and its steeples, by Mr. C. Whympere, with some sketches of picturesque houses in Boston which are interesting; the two sketches given of the celebrated "stump" are not very adequate, and by no means do it justice. "William of Wykeham" is the subject of an article really on Winchester, with some admirable sketches by Mr. Raffles Davison; and there is an article on "Some Provincial Clubs," with sketches of the Conservative and Liberal Clubs in Birmingham, not by any means well done—the sketches we mean; they are among the worst examples we have seen of the modern habit of what we call "scratchy" architectural illustration, with a haze of uncertain lines and no detail. This is a very easy but rather useless way of drawing architecture. The *Art Journal* is devoting a good deal of space to architectural subjects, sometimes very well illustrated; but it seems to be very unequal in this respect, and admits illustrations occasionally by artists who do not at all understand how to draw architecture.

WE have received from Mr. Batsford a volume of designs for cathedrals\* by the late Mr. Pullan, under the title "Studies in Cathedral Design," most of which appear to have been made in competition for various projected cathedrals: in one case, that of a design for Liverpool Cathedral, the design seems to have been made merely as a study for a building to suit the site, and for the author's own pleasure, as it was not submitted to any committee. We can hardly agree with the statement at the commencement of the preface, that "this is a cathedral-building age": certainly not as regards England and the colonies. The formation of new sees has led to an occasional Cathedral being required; but in the two latest most important instances, Truro and Liverpool, the money has been with difficulty found to build half of Truro Cathedral, and apparently cannot be found at all (so far) for Liverpool Cathedral. In regard to the Anglican church, Mr. Pullan suggests that the long aisles and nave of the Mediaeval cathedral are no longer appropriate, and that structures of great size are not now required; nor are they, in a practical sense; certainly not the long nave; but it does not seem to have occurred to Mr. Pullan that another form of plan altogether might be available for modern use, even on a large scale. The design for Lille Cathedral, illustrated in the book, was sent in an open competition, and this being for a Catholic Cathedral, the Mediaeval plan is frankly adopted. The author applied to this the scheme of design on the basis of certain angles of proportion, to which he attached some importance. The design, which obtained a premium in the competition is a fine one; one of the best in the book. The illustrations

include designs for some of the details and accessories of the building. The west elevation of the design for Cork Cathedral, for which Mr. Pullan was an invited competitor, is very like an imitation of Burges's work, but a good façade in itself. The design for the Liverpool Cathedral is of some interest in regard to plan; it is apparently intended as an example of the author's theory of the comparatively small cathedral for modern Anglican worship; it shows the unusual arrangement of an octagonal chapter-house at the extreme east end, connected with the choir ambulatory by a short passage. This is a variety, but we do not know that the architectural result is very happy. An alternative perspective view shows the same arrangement with a rectangular chapter-house. The best piece of architectural composition in the book is the ideal design of a "Geometrical Decorated Cathedral" (Plate 33). The book would have had a more practical value had it shown a more decided attempt to treat the modern Cathedral in an original manner and from the modern point of view. As it is, the designs are all entirely mediæval in character and plan.

WE are not surprised to find, from a letter from the churchwardens of Cossey church in Wednesday's *Times*, evidence that Dr. Jessopp's letter as to the iniquities committed there was, as its style implied, absurdly exaggerated. The churchwardens deny that any of the nave windows retained, within the memory of any one living, portions of the old stone tracery; they state that one of Dr. Jessopp's "five windows of rare ingenuity and beauty of design" was inserted by the present vicar twenty-five years ago, and that the "considerable fragments of brilliant stained glass" amount to a few pieces making about two superficial feet in all, and which are carefully preserved at the Vicarage. They might as well have been preserved in the church, certainly. The churchwardens add—

"Our church was in a wretched state; we received frequent complaints of the water coming through the roof; the damp and the cold draughts of air made it impossible for persons in delicate health to attend the church in winter, and the attendance in consequence was meagre in the extreme. We appealed successfully to the public, and found ourselves with £500. Architects had not troubled us in the past; but now we had money to spend we were besieged with advice, and had we followed all of it our church would now be a miserable jumble of fads and crotchets. We may have made mistakes. Who does not? But we say to all, Do not base your conclusions upon Dr. Jessopp's letter, which we distinctly say is full of gross exaggerations."

Of this we were convinced from the very style of the letter itself. Because of some mistakes in an apparently well-meant attempt to repair a dilapidated church, Dr. Jessopp, quoting from Browning, says:—

"One more triumph for devils, and sorrow for angels;  
One wrong more to man, one more insult to God!"

These lines are used by Browning ("A Lost Leader") in regard to the most tragic spectacle, perhaps, that we can contemplate—the desertion of a great cause by a great intellect from paltry and selfish motives. A man who could solemnly apply such words to the alteration of a village church, in the course of apparently necessary repairs, must, to our thinking, be slightly out of his mind. Mr. Carpenter follows with a letter on the same side, in which he states that he and Mr. Christian had examined the church, and had concluded that by careful and conservative repairs the ancient windows might have been retained, and the design, "and probably also some of the old oak timber" of the nave roof, might have been retained. This "probably" looks very doubtful, and suggests that Mr. Carpenter's plan would have resulted in a modern imitation of the old roof, which another school of anti-restorers would have objected to just as much. Then he quotes another letter from the irrepressible Dr. Jessopp, asking "whether life is worth living" in the presence of such

iniquities as these. Architects and anti-restorers do a great deal of damage to their own cause by such extravagant expressions as these. They repel people whose common sense still retains its balance, and who would support them if they were more reasonable and moderate in their views and in their language.

#### ARCHITECTURAL ASSOCIATION VISITS: HATFIELD HOUSE.

ON Saturday last no fewer than 110 members of the Architectural Association paid a visit to Hatfield House, by special permission of the Marquis of Salisbury. Prior to inspecting the building, the members assembled in the Marble Hall, where a short historical sketch of the house was read by Mr. J. A. Gotoh, Past President, which we print in full below. The house forms three sides of a hollow square, and is built of red brick, with dressings of Caen and Tottenhall stone. Despite its general plainness, or perhaps in consequence of it, the building is charmingly picturesque, with its deep red brick colouring, its angle turrets, and its central clock-tower. Entering by the north front, and passing through the richly-carved screen, the Marble Hall is the first feature of interest, and forms an admirable example of an Elizabethan hall, with its wealth of panelling and carving,—much of it the work of a French or Flemish artist-workman, Janiviere,—its Gobelin tapestry, and its interesting portraits of Mary Tudor, Philip of Spain, Mary Stuart, and Elizabeth. Here also are the battle-flags of English regiments and four captured flags of Napoleon. The original chimney-piece has disappeared, and its place is occupied by a more modern design, by no means out of harmony with the older work. As much cannot be said for the modern ceiling-decoration by Taldeni of Siena, which, on the contrary, sounds the only jarring note in an otherwise harmonious whole. The next point of interest is the chapel, with its curious contemporary Flemish stained glass. The general effect of the chapel is hardly satisfactory, the white marble altar, however beautiful in itself, especially disturbing one's sense of the repose which should everywhere be the predominant quality of the internal finishings of such a house as Hatfield. Here, too, there is much of the modern work of Taldeni. The Long Gallery, on the first floor, is one of the most charming features of this very charming house. It is 160 ft. long and 20 ft. wide, lighted by eight large windows, with an oriel in the centre. The ceiling is elaborately panelled and enriched with gilding. The walls are panelled, and a parquet floor completes the decoration of the room. The grand staircase is, as in most houses of the period, of great interest and charm, with its rich carving and heraldic insignia, its curious wicket-gate, designed to prevent the incursion of the hounds, and its many examples of the work of Albert Dürer, Van Dyck, Lely, Kneller, Zuccherro, Reynolds, and Ramsay. Other notable points in the house are the winter drawing-room and the library. The winter drawing-room or chamber of King James is the most gorgeous if not the most beautiful room in the house. The ceiling, panelled and enriched by elaborate and beautiful pendants, has been richly decorated in gold and colour, while the deep crimson of the velvet chairs and sofas and the heavy gilding of the furniture add to the general richness, which is further emphasised by the luxurious marble chimney-piece, with its life-size statue of James I. in the central niche. In this room are some of the finest portraits; amongst them that by Sir Joshua Reynolds, of Mary Amelia, Lady Salisbury, the grandmother of the present Marquess, and Richmond's portrait of the present Lady Salisbury and her eldest son, Lord Cranbourne. The library is, as it should be, an eminently livable room, depending chiefly for its decoration upon the books. Here are the famous Cecil papers, with their wealth of historical information on the real life of Edward VI., Elizabeth, Mary Stuart, Catherine de Medici, Henry Quatre, Wolsey, Bacon, Essex, Raleigh, and other makers of Elizabethan history. Space will not allow of a full description of the remaining rooms of the house, the billiard-room, morning-room, State bedrooms, &c., with their numerous portraits by Zuccherro, Van Dyck, Kneller, and others,—an intellectual and artistic feast that added much to the enjoyment of the visitors. The grounds, also the privy garden, the maze, and the vineyard were visited and appreciated by the members.

\* Studies in Cathedral Design. By R. Poppewell Pullan, F.S.A., F.R.I.B.A. London: B. T. Batsford, 1888.



The following is the paper read by Mr. Gotch to the members:—

"There is at Hatfield more to be seen than the great mansion of the Salisburys. In looking at the new palace we must not overlook what remains of the old, for not only does it serve to point the difference between two styles of architecture the Tudor and the Elizabethan—but it also furnishes a constant reminder of how the new palace came to be built. Hatfield, or Bishop's Hatfield as it used to be called, belonged for many centuries—even before the Conquest—to the Bishops of Ely, and here was a palace for their delectation. Towards the end of the fifteenth century John Morton was Bishop of Ely, and he rebuilt the palace hard by the church in the most approved modern style. From a plan of it which is preserved in the house, it consisted of one large court, with a way through from west to east. It had the usual large hall; it had a large staircase at each corner of the court, which was surrounded by buildings one room wide, nearly all thoroughfare rooms. Many of them were enlivened by bay windows. Some portions of these buildings—the outer gateway and the west side of the main block—are still left, but are used as stables. Scarcely half-a-century passed after the completion of this building when the monasteries were dissolved by Henry VIII., and that monarch, who liked the place, gave lands in other parts of the country in exchange for Hatfield, which became thenceforth a royal palace. Here lived young Edward till his accession, soon after which he granted the place to his sister Elizabeth; and here lived that princess during the stormy times of Mary, under the protection and surveillance of Sir Thomas Pope, by whom she was sometimes entertained with conferences respecting the building of Trinity College, Oxford, and sometimes with masques and pageants, till her sister interfered and stopped them. Here she remained embroidering in gold and silver, reading Greek, and translating Italian till the day when, beneath the oak which still bears her name, she received the news that she was Queen of England. After that event she came here only at intervals, and the palace passed in due course to King James. He, however, seems to have cared but little for it, for having stopped three days on his way to London at Theobalds, the seat of Sir Robert Cecil, he was so enchanted with that place that he prevailed on its owner to exchange it for the royal palace and manor of Hatfield. That is how Hatfield came to the Cecils.

Sir Robert was second son of the great Lord Burleigh, Elizabeth's trusted councillor. That statesman was himself a great builder. He it was who, besides a large house in the Strand, built Theobalds in this county, and Burleigh House by Stamford Town. Burleigh he left to his eldest son, Thomas, who was created Earl of Exeter. Theobalds he gave to Sir Robert, afterwards created Earl of Salisbury, and Theobalds Sir Robert gave in exchange for Hatfield. But the old palace of Hatfield by no means suited the magnificent ideas prevalent at the time, and before the exchange was completed we find the new house projected, as witness the following letter to Sir Thomas Lake from his "loving friend, Salisbury," written on April 15, 1607.\*

"Sir Thomas Lake, being very desirous to see the house of Theobalds and Parks (now drawing nere the delivery into a hand w<sup>ch</sup> I pray God may keepe it in his posterity untill there be neyther tree nor stone standing) I must confesse unto you that I have borrowed one dayes retraiect from London, whither now I am returning this morning, having looked upon Hatfield also, where it pleased my L. Chamberlaine, my L. of Worcester, and my L. of Southampton to be contented to take the payne to view upon what part of ground I should place my habitation, where I doubt not ere it be long to have the honor to see my Master. This I write because you may knowe that y<sup>e</sup> l<sup>tes</sup> [letters] of yesterday will find me in my pilgrimage at my little lodge w<sup>ch</sup> a fayre sight of read deere before myne eyes."

"My Lord Chamberlaine" was the Earl of Suffolk, who himself built two large houses, viz., Audley End, in Essex, and Charlton, in Wiltshire, so that his opinion might be considered worth having.† The new work must have been started very soon after their visit, as already, in 1608, we find one of the chimney-pieces dated, and in May of 1609 we find among the State papers "An abstract of all the charge that his L.<sup>y</sup> is to be at more than he hath disbursed for the full finishing of his building at Hatfield,

according to the plott." This document gives, under each trade, the estimated sums still required, which amount in the gross to £8,146, but if certain things are left out,—if the job is cut down,—a saving of £710 can be effected. The following note is then added, which shows the state of the building some two years after its commencement:—

"If it please God, by the last of July (the note is dated 25 May), the carpenters will have reared the Hall rooffe and all the rooffe betweene the two towers and the great chamber floores and flat formes, and the 3 tips upon the towers and all the carpentry worke, for the slater to cover the house. But if we alter the property of the building, it will not be ready to cover by Michaelmas next, bycause the rooffes are yet to saw and to frame."

At intervals throughout this year of 1609, we meet with references to the progress of the work, and in April of 1610 we find the building proprietor somewhat restive under the continued cost, and wanting to know why the cost has exceeded the estimate. To a formal order requiring "Mr. Basil, surveyor of h's Ma<sup>ty</sup> workes, and Tho. Willson, my servant," to look into the matter, he adds in his own hand:—

"When you have made the survey of all things belonging to my sayd building as is above required I would have you sett all things downe in wryting, and cause Shawe and Lynning (two master workmen appoynted by me to sett other hands therunto) And further whereas they would have 2,500 thousand bricke more made this yeare, I would have them sett downe the reason why they require soe many, I being informed that much fewer will suffice."

A few days afterwards the estimate duly arrived, signed by all concerned,—Mr. Basil, Willson, Shaw, Liminge, and Jeffery Culceth, who was apparently a foreman.‡ Six months later Willson sends a "Bill of disbursements about Lord Salisbury's house at Hatfield" for the preceding year;§ and on November 8, 1610, Robert Liminge sends Willson another long report on the state of the works. From this lengthy document a few short extracts will help us to realise the actual building of the place, which, after all, was performed by ordinary human beings, and not, as Gray would have us think, by "fairy hands." Liminge writes:—

"Mr. Willson, my dutie remembered unto you. The mason is in hand with the chappell window, and that would be very well made an end of before Crismas if we had stone brought downe, for he hath above 30 workmen at worke. And there is a great deale of masonry to doe about the house besides the window, w<sup>ch</sup> workes will aske much time. The mason talketh of discharging some of his men for want of stone, w<sup>ch</sup> by no means must be for the hinderance of the businesse in the springe. Therefore, sir, I would intreat you to take all the courses that you can for sending away of the stone from London. . . . The front of the gallery is brought up above the first story to the height of the pedestalls, halfe the rainge and the other part is wrought ready to sett at the Springe. The Mason is paving the great beere seller with purbeck, and hath layed some of it."

The bricklayers are next mentioned, and among other things they are "in Land with small dreames within and without the house for the drawing away of the water from the foundations and romes. . . . And I thank god the maine building standeth firme and sure in every place." He then goes on to the carpenters, who "have brought up steares in six severall places from the ground to the top of the house"; and the plasterer, and the plumber.

"The glasier (he says) shall sett up as much glase in those windowes where the scaffoles may conveniently be taken downe and we will buy a load or two of pease straw for the stopping of the other windowes for the keeping of the weather out of the house. . . . Sir, (he concludes) I would entreat you to tell Mr. Bowle that I will bring a just mould of the lights of the Chappell windowes according to the proportion concluded of betwene him and I at my next retourne to London. So wishing you health and prosperity, I end.—Yours, in all dutie, Robert Liminge."||

The "mould" of the chapel window may possibly have been for the purpose of procuring the stained glaze.

The spring of 1611 came, and with it very considerable activity, for on July 1st of that year the house is reported, room by room, as being nearly ready for occupation; at any rate, the ensuing Thursday would see most of the rooms matted, and hanged, and ready, and the upper lodgings would be hanged and ready for the Lord Cranborne on Tuesday night.¶ In the

parapet above the main south entrance is the date 1611, so that we may safely conclude that the house took a little over four years to complete. The total cost, notwithstanding the estimate which we have heard, was,—according to the building accounts published in Mr. P. F. Robinson's excellent monograph on Hatfield,—7,631l. 11s. 3d., including impaling the parks, some work in the gardens, and bringing water to the house. The various items are of very considerable interest, but too long to repeat here. Three only will I trouble you with. The painting, gilding, and colouring of the whole place came to 407l. 9s. 1d. The carving of the stone lions about the house, the pew-heads in "the Chappell," and other work duly specified came to 130l. 14s. 2d.; and the "frett seelinge" in the long gallery, together with the architrave frieze and cornice of the King's bed-chamber cost 487l. 10s. 1d.

Allow me one more reference to contemporary letters, which I believe have never been published, but which throw a very interesting light upon the building of one of the typical houses of a great building era. This letter is from Thomas Willson to Lord Salisbury, and it deals with the proposed arrangement of the ornamental waters. Willson writes on the 25th September, 1611, that he has been to Hatfield with "the frenchman,"—

"Whose purpose is to make a newe conservedean (as he calls it) at the corner of the bowling place next the upper part of the est garden, w<sup>ch</sup> shall couteine all the water of the source as well the wast as the rest, soe that all the cesterne that now are wibes of you use, your loe will like to have the great open cesterne in the garden to putt fish into to be redy upon all occasions. The great store eastern in the ryding court he would have taken downe and the materials imployed in that be meaneeth to make. This cesterne he will make will cost as he saith 300<sup>l</sup> besydes the materials of the old one, and 1000<sup>l</sup> more the bringing home of all the water and turning the pypes to serve the use of the offices in the howse as nows they doe."

After further particulars, he goes on to say that the French Queen's gardener had come to him bringing over some fruit trees, 2,000 for the King, and 500 for Lord Salisbury, he wants a man the next morning to superintend the removal of them from the Tower Wharf, and Willson asks for a reply that evening, "as the frenchman expects it from me early to morrow-morning." He was suffering from the tooth-ache it seems, and he ends by saying, "other things concerning Hatfield I defer till your loe have leysure and I helth to relate by word."

We have now watched the building of the house from the time the site was in discussion. You may perhaps ask, Who was the architect? To this no definite reply can be given. There is no plan in Thorpe's book, and we hear of no one engaged on the work beyond those already mentioned; and it is only by their help and with hints from his building friends, the Earl managed the work himself.

The house as it stands is a fine specimen of its kind. The plan is a square flat U, i.e. it consists of a long main range with two wings, one devoted chiefly to the servants, the other to the family. Much of the detail is very plain, the principal elaboration being reserved for the garden front. Certain changes have necessarily been wrought by lapse of time. The arcade under the long gallery was originally open, but has been filled in with pierced stone work and glass, to the increased comfort of the house inside, if to its detriment outside. Early in this century the whole place underwent extensive repairs, and in 1835 a lamentable fire occurred by which a part of the west wing was destroyed, but it was rebuilt, we are told, in exact accordance with the original design. Of the rooms inside the most interesting are the Hall, with its elaborate screens bearing the arms of the founder's son and daughter; the long gallery with the "frett seelinge" and panelled walls, the main staircase, with much heraldic carving, and a curious wicket gate, said to be intended to prevent dogs going up into the state apartments; the library with a chimney-piece bearing a mosaic portrait of the founder and the date 1608, the great chamber or King James's room, and the interesting chapel, with its stained glass of the period. Of course in a house which is inhabited by people who naturally expect the greatest amount of comfort which the age affords, it must inevitably happen that old arrangements must give place to new, old fittings and furniture must gradually disappear as they get shabby and decayed. The

\* State Papers.—Domestic, James I., Vol. 27, No. 7.

† The united wisdom of this illustrious party pitched upon a spot which necessitated the removal of most of the 14 palace, but the rest was preserved, and may be seen to-day.

\* State Papers.—Domestic, James I., Vol. 45, No. 69.

† Ibid., Vol. 53, No. 65.

‡ Ibid., No. 62.

§ Ibid., Vol. 65, No. 3.

¶ Ibid., No. 79.

¶ Ibid., Vol. 53, No. 9.

\* State Papers.—Domestic, James I., Vol. 67, No. 62.



consequence is that there is not a great deal of the original work left inside the house, and what there is shows signs of having been repaired and renewed in many places. Thus the screens in the Hall show much new work. The chimney-piece, which Mr. Robinson says had over it the arms of Lord Burghley and the date 1575, is gone; so are the heads of the Caesars in the ceiling, and the organ and organ-case which used to be in the gallery. Nevertheless, there is a fair amount of interesting detail, while the house outside retains its original appearance very completely. There you may still see the date 1611, and the arms of the founder on the south front. On the wings are the heads of iron tie-bars, fashioned into the initials R. S.—for Robert Salisbury. The pedestals of the front of the gallery up to which the masons had got on the 8th Nov., 1610, remain as they were left. The spout heads are dated many of them in the 17th century. There, too, are the towers, the roofs of which had been leaded, but not yet soldered, on the same 8th Nov., and we and all lovers of architecture must always echo Robert Liming's words, "I thank God the maine building standeth firme and sure in every place."

#### THE BRITISH ARCHAEOLOGICAL ASSOCIATION AT GLASGOW.

"We this week bring to a conclusion our special account of the Glasgow Congress of the British Archaeological Association."

On Sunday, Sept. 2, a sermon was preached at the Cathedral to the members, by the Rev. Dr. Burns, the building being crowded in every available part.

Monday, the 3rd, was devoted to a survey of the Antonine Wall, and to a brief inspection of the ruins of Linnithgow Palace. On the arrival of the members at Bonnybridge Station a visit was paid to Elphinstone, an outpost work of the great barrier on its inner side. It consists of a well-defined mound, commanding an extensive view; but nothing is visible of foundations or earthworks. Here the Rev. Dr. Russell, proprietor of the estate, read a paper on the site and its probable connection with other fortified spots within sight. On leaving, the visitors proceeded along the Roman wall itself, the earthen mounds and the fosse outside them being well defined, the latter being deep and wide. The whole is in this district overgrown with wood and bracken, impossible of passage by so large a party had not Dr. Russell prepared a way by cutting a path through the entire extent of his property traversed. Passing over *Achnabuth*-tent field, Rough Castle at last was reached, after a long walk upon the wall, the condition of the land well justifying Dr. Russell's remark that it was all virgin ground, untouched since the Romans left it, either by ploughshare or railway. The great barrier extends in an all but perfect condition from Elphinstone to beyond Rough Castle, the only difference being that the fosse is somewhat filled up by the decay of the underwood of so many centuries. Its over-grown condition alone prevents its imposing proportions from being seen at first sight. Rough Castle is one of the military posts erected at intervals along the line of the wall. It stands on the summit of a steep bank, rising from a small streamlet strongly impregnated with iron, and its earthen banks are to be traced almost throughout their entire course. The plan is that of a camp of two compartments, but the wooded nature of the ground prevents perfect observation. Carriages being in waiting, the party drove to Bantaskine House, a modern building, where ex-Provost Wilson gave them an unexpected and hearty welcome, refreshments being set out on the lawn around the mansion. A fine section of the wall, cleared of growth of plants and well turfed, exists in the grounds, affording a capital example of what the wall must have been along its entire course. As a rule it occupies high ground. Beyond the wall was the City of Camelon, the site of which, now bare and level, affords an admirable position for excavation, since its existence, in country generally supposed to have been abandoned to the unconquered Caledonians, would most probably afford evidences of much value bearing upon a little-known page of early Scottish history. The site is marked on the Ordnance maps as an area of considerable size.

Carriages being resumed, after hearty thanks had been tendered to their host, the town

of Falkirk was reached. Here, Mr. J. Riddoch M'Luckie, who had previously pointed out many interesting features of the Antonine Wall, gave to each of the party a printed résumé of his remarks, and of others relating to the ancient town of Falkirk. The church is a modern fabric, filled with galleries and pews as is the way of Scotch churches; but the old tower, once central, still remains as a porch to the present fabric erected on one side of it. It has been, however, so repaired that no traces of its antiquity occur at first sight. A plan of the old cruciform church, drawn by John Shaw, jun., 1788, the property of the Session, was exhibited. It shows that the former church was built with its corners singularly out of a right angle. Several old effigies, more or less mutilated, are preserved in the tower. The graves of several Scottish worthies in the churchyard were inspected, as well as a handsome cross erected by the Marquis of Bute to the memory of the men of Bute who fell at the first battle of Falkirk. At the adjacent Town-hall luncheon was partaken of, on the invitation of the Provost and Magistrates. Progress was then made through the beautiful park of Callendar House, which was opened for the occasion, past the mansion, a building of old foundation, but the front is modernised.

Linnithgow was reached too late for justice to be done to the remains of the Palace, or to the architecture of the parish church adjacent to it. The Palace is a roofless ruin, as it has been since it was burnt by the English troops after the rebellion of 1745. The masonry of this beautiful building stands well the ordeal of exposure to the elements, as all old Scotch stonework appears to do, but it was not with feelings of satisfaction that the members found many signs of decay, and noticed the neglected state of so interesting and important a building, in which so many events of Scottish history have been enacted. The church is of large size, and a fine example of late Gothic work. It has a western tower, now deprived of its steeple, of four open arches, but it is otherwise in capital structural condition.

At the evening meeting the following papers were read, the chair being occupied by Mr. Thomas Blashill, Superintending Architect to the Metropolitan Board of Works:—1. "Notes on a Diary by one of the suite of the Duke of York, afterwards James II., under date of 1679, on the journey from London to Scotland," by Mr. Geo. R. Wright, F.S.A. This paper was interesting in showing that a journey which can now be accomplished in nine hours then took royalty, with all the facilities of the time at command, as many days. 2. "The Classification and Geographical Distribution of early Christian inscribed Stones in Scotland," by Mr. J. Romilly Allen, F.S.A. Scot. In the author's absence his paper was read by Mr. W. de Gray Birch, F.S.A., one of the Honorary Secretaries. 3. "The Characteristics of Ancient Scottish Architecture," by Mr. E. P. Loftus Brock, F.S.A.

The following is a summary of Mr. Allen's paper. It commenced by showing that there was a pressing want for an antiquarian survey of England and the adjacent countries included in Great Britain and Ireland, in which every trace of the work of man in early times should be recorded. The archaeologist of to-day was in the position of a geologist in the days when no maps were in existence showing the extent and course of the various rocks. He wished that such a survey had preceded the Ancient Monuments Bill, for it was of more importance that such a permanent record should be in existence. The destruction of ancient monuments was always to be deplored, but the loss was not so irreparable when they had been measured and photographed. No class of our national antiquities were so deserving of being exhaustively surveyed as the early Christian sculptured stones; and he presented in his paper the results of his own investigations, in the hope that it might stimulate sufficient interest in the subject to lead to a fuller survey being undertaken either by the Government or by the combined effort of the different archaeological societies. The characteristics by which they were enabled to classify the monuments were (1) the style of the lettering of the inscriptions; (2) the peculiarities of the ornament and figure sculpture, and (3) the shape and construction of the monument. The number of inscribed stones in Scotland was exceedingly small when compared with those in other parts of Great Britain. It was not easy to explain this, for Scotland possessed more sculptured monuments without lettering, ornamented in a similar way to the illuminated

pages of the Hiberno-Saxon MSS., than were to be found in Ireland, Wales, or England, and the Scot had never been behind his neighbours in literary culture. Although there were comparatively few inscribed stones north of the Tweed, a large proportion of the monuments had symbols carved upon them the meaning of which was at present unknown. It might, perhaps, turn out eventually that the absence of inscriptions was explained by the presence of these symbols. They could only express their astonishment that when so much was to be learnt from this branch of research, so little care had been taken to collect or preserve the materials whence these precious "sermons in stones" were to be obtained.

#### The Characteristics of Ancient Scottish Architecture.

Mr. Brock, in his paper on this subject, remarked that Scottish architecture, so far as was included within historic times, might be divided into three broad divisions—the works of the ancient Christian days; of those in Romanesque and Pointed styles; and of those erected since the introduction of the Renaissance or Italian taste. They might confine their attention to the two first. Of the first it might be briefly said that the works were similar to the contemporary ones of Ireland, from which, without doubt, their style was introduced. The ornamentation was similar to what was now found upon so large a number of crosses and slabs in Wales, Cornwall, and in many other parts of England, all in like manner derived from the art of the native Church in early times. There were many small churches and oratories still remaining, and still many more which, although of later date, resembled them in many particulars. These, like the other fabrics of the early Church in our isles, were square-ended, and fairly well orientated, there being, however, this peculiarity, which was not noticed, or not to so great a degree, in English works—that there were many early churches which were many degrees out of east and west. There were also many of which the angles and not the fronts were nearly towards the cardinal points, in this respect resembling the great church of Sta. Sophia at Constantinople. Thus, among many others, the following might be noted at random:—St. Giles's, Edinburgh; Duddingston, Ratho, Corstorphine, Seton, Dunglass, Linnithgow, Dalmeny, Kirkliston, Douglas, and many others not only in the home counties, but in the isles. Of all the churches of which plans were given in Muir's "Notes," only four were due east and west, or nearly so. Of all those named in the "Ancient Parochial Churches," only a single example was due east. Had shorter buildings ever stood on those sites on the same axis, and the axis was seldom changed,—their angles and not the faces would have been to the cardinal points. These would have been to the cardinal points. These features of the earliest of Scottish churches were of no little interest to the ecclesiastical student, for they appeared so opposite to the arrangements of the churches of Italy, where no rule of orientation had been observed at any time either early or late, and where the churches faced in any and every direction. As the churches of Scotland were founded, so did they continue. The past was found in the present to this day in that respect. Thus Glasgow Cathedral, rebuilt over and over again, without one stone remaining of the earlier churches, yet showed a square east end, and also in the axis of the present lengthy structure a great divergence from true orientation. It derived that from probably the earliest fabric erected on the site, the angles of which, and not the faces, would have been more truly in the direction of the cardinal points. The Mediaeval works of Scotland claimed their largest attention. They were of the highest order of merit as regarded artistic design and feeling. The Romanesque style was found in perfection later than in England, but the examples which remained were richer architecturally. They had some sculpture, but the effect was produced by architectural features more entirely than across the Border. Dalmeny and Leuchars were examples. While the plan was but an enlargement of such churches as Kilpeck,—what Shroben was,—Barfreston and many others, yet in all these the sculptured ornamentation was more apparent than in Scotland. It was in churches of this age that apses were found, but they disappeared only to occur again, as they also did in England for a short time and in a few instances, angular in form and not semi-circular, towards the end of the



fifteenth century. The church of Linlithgow afforded a very good example. The First Pointed style was found with many combinations of Romanesque features, and the stage of transition continued for a much longer period than in English or French work. The style had produced some of the most beautiful works that Scotland possessed. Arbroath and Kilwinning Abbeys, St. Andrew's and Elgin Cathedrals, and Holyrood Chapel, afforded perfect specimens of purity of design and beauty of execution that had never been surpassed in any other country, even in structures of much larger size. These works had been said sometimes to resemble English and sometimes French churches. They did neither. They were designed in a more compact manner than in England, they were taller in proportion to their width; their parts were smaller and more united to the adjoining ones, and had been studied more in relation to the parts that came next to them. While it was true that the plain, flat soffits of the porches of Laon Cathedral were found also at Arbroath, yet, while there were certain resemblances, there were many features in French work that never appeared in Scotland, and many Scottish features that were not to be found in France. Indicating some few features which bore testimony to the statements made, he observed that the west doorway at Elgin and others were divided into two, following the usual French arrangement, but there were mouldings and carved foliage only. There was not a single example in the richest doorway in Scotland of any sculptural figures in niches such as formed so conspicuous a feature in French work. French spires of early date were often highly pointed. There was no example in Scotland of an acute angle. Flying buttresses were common in France, in Scotland rare. Apse were usual in the one country, absent in the other. Forms once adopted in Scotland had remarkable vitality. Thus, for instance, round-headed arches appeared in early work. They remained through the whole Gothic period, being found in the latest Gothic works, adorned with all the mouldings and carvings of that period; and indeed they continued until the old architecture was lost in the modern. The Norman west doorway at Jedburgh had a pretty arrangement of a large angular canopy and two smaller ones, probably an addition to the doorway. There was nothing exactly like it in England, and it was certainly Scottish rather than French. It appeared again at Elgin. Something very like it was found again on an early seventeenth century entrance at Ochiltree Castle. One of the most remarkable features of Scottish architecture, and one in which it greatly differed from either English or French, was that there were but two Pointed styles, and not three. What was known as the Perpendicular style in England did not appear in Scotland. In its place there was the continuance of second Pointed forms, with certain variations in the design of the window tracery, at first not a little perplexing to the student. The beginning of the style had all the features of their own Geometrical work, with some stiffness in design. Of this, Glasgow Cathedral, in its choir and also in the nave, afforded the largest and one of the best examples. The progress of the design could be traced to the first incipient example of open tracery, three lancets contained within a single window—a design not overgraceful, but very common. The Church of St. Monance, erected about 1369, had, with far more solidity of form so far as regarded the structure, all the features of their own flowing Decorated style as regarded the patterns of the windows. The apse of Linlithgow and the east window of Melrose had certain upright lines in the tracery not unlike their Perpendicular style, and so far and no more there might be a certain Dunblane itself had flowing Decorated windows beside, and of the same date as that which resembled. Yet the College Chapel of Aberdeen, erected about 1494, had flowing Decorated tracery enclosed within a semi-circular arch; and at Melrose the same thing might be observed to a far greater degree. Dunkeld Cathedral had also many beautiful windows of flowing Decorated style in the nave, dating from 1406 to 1450. Iona Cathedral was of peculiarly early form, but its ornamentation was late. Corstorphine Church, founded in 1429, was also very early in appearance, but very late and curious in all its features. It was stone-roofed, showing an elaboration and a continuance of the form of roofing of the earliest oratories. Crichton Church was another early-looking church with a low tower, having the peculiar Scottish feature of a parapet walk

round it and a saddle-backed roof. Its windows had flowing tracery, but it was only founded in 1449. The design of the window-tracery was infinite in its forms, and all of very great beauty—in some examples similar to English patterns, in some to French ones. He did not agree with the statements made with respect to these windows being Flamboyant in design pure and simple. There was nothing but what any school of artists would work out for themselves, and a single man of genius would have had individuality enough to introduce the use of such a feature as that to any style, personal design; and Roslin Chapel might be cited as the design of one mind following upon contemporary work. It was neither foreign nor English. Its lace-work patterns here and there might find a counterpart in some Belgian work, its heavy-pointed vault might find a better one in many a Scottish castle, but the 'Prentice Pillar and the general conception was nothing if it was not of individual design. The same might be said of the adaptation of the beautiful and peculiar crown on the steeple of St. Giles', Edinburgh, also at Aberdeen College and Glasgow Tolbooth, and formerly at Linlithgow and Haddington. He proceeded to show how the old Scottish architecture differed from the contemporary work both of England and France, and to assert its claim to be considered a national school of art. In closing, he pointed out the pressing need for attention being directed to preserve all that was left of these works, of which, he said, the ancient nation might well be proud.

Dr. Rowand Anderson expressed a hope that Mr. Brock's paper would lead to excellent results. He was glad to find that Mr. Brock combated the feeling that had prevailed so absurdly in many writers on the subject, that Scotland was indebted almost entirely to the French for their architecture. That was not so. The Scots were indebted to themselves; but he was not altogether inclined to go the length of Mr. Brock, and say that their architecture was solely and exclusively Scottish. As far as his knowledge went, he thought that up to the War of Independence, after the death of King Alexander III., the ecclesiastical and castellated architecture of Scotland ran on parallel lines with that of England. He admitted at once that there were many distinctive features to be found in Scotland, that were not seen in England. But, on the other hand, he did not think that the features in Scotland showed so great differences as were to be found between different districts in England. All over the country architecture was practically the same as a language, in that it was to be found in different districts in different dialects. Undoubtedly after the War of Independence, when the communication between Scotland and the south was practically cut off, Scotland developed a style of architecture which was very strongly marked, and only to be found there. He could see very few traces of the French in that architecture. Mr. Brock ascribed the great absence of churches in Scotland to the rebuildings which had taken place, and no doubt that was so, but the area of England, and therefore the number of churches would be fewer in Scotland than in England. Mr. Brock's appeal on behalf of the preservation of their national monuments would, he hoped, effect some good. There was no doubt that throughout the length and breadth of Scotland their monuments of architecture had been sadly neglected, both by individuals and by the State. As far as individuals were concerned, much good had been done of late years. The splendid example set by the Duke of Argyll, who some years ago spent a large sum of money on the island of Iona; of Lord Lothian, who gave of his means liberally towards Jedburgh; of the Earl of Home, who so actively interested himself in the old church at Douglas, in Lanarkshire; and what they saw so well and generously done at Doune Castle by Lord Moray, indicated a most excellent spirit, which he hoped would continue to spread. As far as the State was concerned, he was sorry he could not point to any great hope of much being done. He trusted that the visit of the Association to Scotland would be the means of rousing up a thorough spirit of interest in these buildings. Scotland was full of most interesting remains; they were surrounded by a halo of history that was to be found nowhere else, and they could not afford to lose them.

Mr. Ewan Christian remarked that the in-

fluence of the French might be distinctly seen in the architecture of Stirling Castle and church. He was very much interested in what he saw at Paisley the other day, as he did not know they had anything so fine close at hand. In some of the Paisley works there were a vigour and power which were delightful. It was to be hoped that researches would be continued in Scottish archaeology.

Professor Hayter Lewis, F.S.A., was very much surprised on going to Stirling to find the neglected state of that most interesting castle. The old chapel was now a store-room, and there was not a particle of the old castle used as it ought to be. One could hardly speak too strongly of the absolute necessity of making representations to the Government, and he hoped they would be able to devise a memorial on the subject.

Mr. W. Black, F.S.A. Scot., Local Congress Secretary, did not think there were so few parish churches in Scotland as one was at first inclined to believe. The history of many of those churches was to be found in the law reports, as those in ecclesiastical circles were extremely litigious. It seemed to him that the much-decried Reformation had had less to do with the destruction of churches than the placing of the duty of maintaining them upon the shoulders of the heirs of the parish.

Mr. Brock, replying to the discussion, corroborated Dr. Anderson's remarks regarding what he had termed the different dialects of architecture. It had frequently been his lot to point out to his colleagues the differences that were to be found in Devon or Cornwall and Norfolk, or between Wales and England. He was quite in accord with Dr. Anderson with respect to what ought to be done by the Government. He hoped that one outcome of the Congress would be an urgent representation to them with regard to the condition of Scottish historical buildings. They were buildings which, if allowed to fall into decay, would be lost to the country, and would be the cause of much reproach. If, on the other hand, there was any truth in the old proverb, "A stitch in time saves nine," it was true in regard to the architectural monuments of Scotland. Stirling Castle was full of disfigurements and defilements which ought not to have been thrust upon one of the most important castellated buildings in Scotland. In conclusion, he called attention to the condition of Linlithgow Palace. He had descended to the basement when visiting the building that day, and found water, probably the showers of the three days previous, percolating through the roof of the vaults. The building was also otherwise neglected, and common sense and common knowledge told them that it could not exist in the state in which it was at present without harm accruing.

The concluding day of the Congress, Tuesday, September 4, was devoted to a visit to Dunfermline, and to the reading of various papers, for which there had not been time at the previous evening meetings. A day of brilliant sunshine, after others more or less gloomy, was very welcome to the somewhat lessened but still large gathering. Dunfermline was reached about half-past ten, and the party was met by Provost Donald, with various members of the municipality. After being driven through the public park and some of the principal streets, they assembled in the Council Hall, where they were joined by Sir Arthur Halket, Sheriff Gillespie, the Rev. Mr. Stevenson, and many others, members of the School Board, and some of the gentry of the district. The Provost gave a cordial welcome to the archaeologists, and called upon Mr. Geo. Robertson, F.S.A. Scot., Custodian of the Property of the Crown in Dunfermline, to read a paper descriptive of the rise and progress of the ancient borough, and of its many objects of antiquity.

Mr. Robertson referred to the etymology of the name *Dun-fear-linne*,—the castle by the crooked stream,—and spoke of the Castle of King Malcolm Canmore, a fragment of which still remains not far from the Abbey, and which appears in the arms of the town. The celebrated Abbey was founded about 1075 by King Malcolm, at the request of his Queen Margaret. The eastern portion of the church was rebuilt about 1230, and the Abbey buildings were of still later date. Under Mr. Robertson's guidance the party proceeded to inspect the objects which he had described, and the first halt was made within the nave of the Abbey church, which still remains intact, the massive pillars and round arches being very good Norman



work, while the western portal is a remarkable enriched specimen. The eastern portion of the fabric has disappeared, and on its site is a modern cruciform church, joined on to the spacious nave, which only forms a vestibule to it. The central tower of the new church stands exactly over the spot where the grave of Robert Bruce was found in erecting it, and the King's title is carved in large open-work letters in the parapet of the tower, but the spot internally is not visible, since it is covered by the pulpit, an unsatisfactory state of things which called forth remark from one of the members. It is satisfactory to know that a project is on foot to erect a monument over the spot, and to set back the pulpit from its present position. Mr. Robertson then led the party to the tomb of Queen Margaret, which still remains at the extreme east end, enclosed within the walls of the Lady Chapel, which are 3 or 4 ft. only in height. The walls show the bases of what must have been a very elaborate arcading around them. The tomb consists of massive blocks of marble, full of large fossils; and, although now in the open air, it is solid and perfect, but its canopy of columns and arches have long since been destroyed. The enclosure has been raised around by the Government. Mr. Robertson then pointed out the remains of the spacious refectory of the Abbey, built on high ground above the stream, and afterwards the ruins of the Palace of the Kings of Scotland, adjoining to the Abbey, and connected to the refectory by an arched passage. The portions remaining show traces of Norman masonry, very much altered by the insertion of large later windows. A fine vaulted crypt remains. Progress was then made to the fragments of Malcolm Canmore's tower, which consist of only a few portions of walling of a date more recent than the time of King Malcolm, but erected upon a bold circular mound, which, with a long narrow inclined path leading to it, are of much older date than the masonry. The spot is one of great beauty and of great strength, the banks descending in precipices to the stream far beneath.

By invitation of the provost and magistrates, luncheon was partaken of, after which the party returned by train to Glasgow to attend the closing meeting in the Corporation Galleries. This was held at half-past four o'clock, Archbishop Eyre, D.D., presiding for the commencement of the proceeding, but afterwards the Marquis of Bute. Various papers were read, including two by Professor Ferguson, the first being on the Literature of Witchcraft in Scotland, and the second upon "Kiraní Kiranides," a book of seventeenth-century date, containing magical receipts, a work of great rarity, supposed to have been written by a Persian king.

These were followed by a paper by Mr. W. G. Black, F.S.A.Scot., Hon. Local Secretary, on the Derivation of the Name of Glasgow. Following Professor Rhys, he considered that the name meant *Glas chu*, or "the greyhound." He was followed by Mr. W. de Gray Birch, F.S.A., who read a paper on the "Materials for a Scoti-Monasticon." He passed in review the various old records still in existence, particularly those in the British Museum, and also the more modern writers who have treated of the old monasteries of Scotland.

On the motion of the President, votes of thanks were passed to the Lord Provost, the provosts of the various towns, the officer commanding at Stirling Castle, and all the other public and private gentlemen who have helped the Congress. The proceedings were brought to a close by the acknowledgment by the Marquis of Bute of thanks to himself.

In the evening a *congrégation* was held in the galleries of the Corporation by the Lord Provost and Magistrates of Glasgow, given to the members of the Association and those of the Library Association of the United Kingdom. The guests were received by Sir James King, Lady King, and the members of the municipality. The spacious galleries and their artistic contents were seen to great advantage by the company, about 600 in number, the Marquis of Bute and the Marchioness being present.

The Congress thus concluded has been attended by numbers of the members and their friends much in excess of what is usual at such gatherings. The proceedings have been followed with apparent interest by the people of the various localities visited, and by the Press; and it is to be hoped that the amount of attention directed to the ancient remains of the land will be conducive of good permanent results. Hospitality has been shown to the members

profusely in every direction. The weather has been at some times cloudy, and at others worse, but it has never been unpropitious enough to interfere with the carrying out of the programme, and when the sun has shone the magnificent scenery traversed has been seen to great advantage.

The meeting has been remarkable for the number of architects who have attended it, among whom were Messrs. Ewan Christian, A. G. Bates, T. Blashill, E. G. Paley, of Lancaster, J. Honeyman, of Glasgow, Loftus Brock, Dr. R. Anderson, of Edinburgh, Professor Hayter Lewis, and others.

#### THE METROPOLITAN BOARD OF WORKS INQUIRY COMMISSION: FURTHER EVIDENCE.\*

MR. W. A. LINDSAY, sworn and examined, said he had been a member of the Board since October, 1885. He represented Kensington, for which there were two other members. He did not become a member of the Board until substantially all the transactions into which the Commission had been inquiring had occurred. He was personally very strongly opposed to the practice of the Board in referring matters to committees sitting in private with power to act, because, while he did not imagine that there was a clique on the Board desiring to carry out any corrupt practices, yet the practice of referring matters to committees with power to act would facilitate such cliquism if it existed. Witness was at first opposed to the dismissal of Robertson, because the report of the Committee disclosed no evidence against him. He did not say that the report of the Committee was a right one; but he took it as it stood, not being a member of the Committee himself.

Mr. J. Ebenezer Saunders, F.R.I.B.A., recalled and further examined by the Chairman, said he was desirous of making a further statement with regard to the evidence which some of the witnesses had given before the Commission.

With regard to Mr. Isaacs's evidence, witness wished to deny that he caused any pressure to be put on Mr. Villiers so that he (witness) might become the architect of the London Pavilion. Villiers came to him as an ordinary client, and he was received as such. It was a matter of honour. Witness also wished to rebut the statement made by Mr. Isaacs, that Villiers was indignant at having an architect (the witness) thrust upon him who was not only incompetent to do the work, but too avaricious to spend the necessary money to employ competent assistants. Witness said that, looking at the course of his professional career for more than forty years, and at the buildings standing in all parts of the City carried out from his designs, and knowing the staff that he had in his office, he was bound to answer that, for his own professional reputation. The general public—and there were many who knew his professional standing,—would know the contrary. Witness believed that Mr. Woodward was in error in saying that he (witness) spoke about Messrs. Isaacs and Florence posing as architects for the Pavilion. Witness also denied Mr. Woodward's statement that at witness's suggestion he (Woodward) had an interview with Villiers, and reported the result to witness. Witness added that he had been many years in the profession, and he believed he had never done a dishonourable act as that would have been. Witness was asked whether there was any objection to his acting as architect if Mr. Villiers wished him to do so. He said that there was not, and that he should feel it an honour if they were to be good buildings; but he said that as a member of the Board he could not vote on or take part in anything to do with Mr. Villiers's proposal. He did not add to that statement the remark that "there were more ways of killing a cat than hanging it." Witness wished also to be clearly understood to say that at the time he became architect for the London Pavilion, he knew nothing whatever of any relations between Villiers and Goddard or Robertson in reference to that site. He was prepared to swear that, to the best of his knowledge and recollection, he had no conversation with Robertson as to the corner plot of the site until an after-date. Did not know how it was that Robertson spoke to Mr. Woodward on the subject, and to Villiers. Nothing had passed between witness and Robertson, and he (witness)

\* For summary of previous evidence see the *Builder*, pp. 8, 44, 66, 83, 103, 124, 161, 179, ante; and last volume, pp. 434, 446, 466.

repudiated entirely the idea that he should have suggested,—he never had done such a thing, and he hoped he never might,—that there would be the slightest difficulty in passing anything at the Metropolitan Board unless he (witness) was the architect. With regard to Mr. Verity's evidence, witness said he saw Mr. Verity "continually" on the subject,—a great many more than three times,—but he had no record of them. He charged it all from his head afterwards. It was only a proper professional fee for that particular work. He advised upon the new entrances to the theatre. He was a member of the Theatres Sub-Committee of the Board, and it was that Sub-Committee which would afterwards have to deal with those plans; but it did not strike him as being in the slightest degree improper that he should accept a retainer to give professional advice under those circumstances, because, for the twenty-five years he was a member of the Board, he had always kept away or abstained from voting on matters as to which he had been professionally concerned. Moreover, whenever he had been professionally concerned, he had always mentioned it at the time, or intended to do so. Further questioned, witness admitted that he was present at a meeting of the Theatres Sub-Committee on one occasion when the matter in question came forward, and moved or seconded a resolution upon it. Would not swear that in that particular instance he mentioned that he was professionally interested. With regard to the payment to witness by Messrs. Spiers & Pond for work done in connexion with preparing plans for the proposed "Cock" Tavern, in Fleet-street, considerable services were performed for the money paid, which was not in any way regarded by him as payment for services rendered in connexion with the "Criterion." As to Mr. Earle Bird's statement that he paid witness 522.10s. for advice with regard to plans which were to come before the Board, witness said that the amount of his remuneration for that work was not discussed until four years later. The plans as to which he advised Mr. Bird had ultimately to come before the Building Act Committee of the Board for approval. Witness was at that time a member of the Building Act Committee, but he did not see anything questionable in acting professionally in a matter that was to come before the Committee. Asked whether he had not moved at the Board meeting the adoption of the recommendation of the Committee that Mr. Bird's application be granted, witness said that he found by the Board's minutes that he had moved it, but it was evidently done accidentally, in this way: He, as a former Chairman of the Building Act Committee, would, in the absence of the Chairman of the Committee, be asked to move the report, and, as was usual, a number of recommendations were moved together, or *en bloc*, unless any one objected. When he moved that batch of recommendations, he did not know that Mr. Bird's application was included. With regard to the evidence of Mr. Francis as to witness's share in the architectural supervision of the work at the Grand Hotel, witness said that it gave not only an inaccurate but a totally wrong view of the whole case. He (witness) was certainly at the building three times a fortnight, if not twice a week. He continually met Messrs. Francis on the works, and at other times he was there alone. He denied that the plans were entirely prepared by the Messrs. Francis. The whole of the plans of the Grand Salle, and of the Salle à Manger (the secondary one) were all prepared in witness's office; all the other ground-plans and the elevations and the corner of that building were altered or re-designed by him—he meant, designed by himself and the drawings executed by his assistants, and not by Messrs. Francis. He was not prepared to swear that he did not know beforehand that if Messrs. Gordon obtained the site he was to be joint architect of the building with Messrs. Francis, but he concluded so. Mr. Gordon was a very old friend. Did not think that these circumstances would be likely to bias his view as a member of the Board as to whether Messrs. Gordon's tender for the site should be accepted. There was no possibility of one member influencing the whole Board. The Board were a great deal too sharp in serving the public to allow any one member to influence any letting, even if he had the will. Witness was sure he had not the will to do so. With regard to the plans for the Hôtel Métropole, a large number of them were prepared in his (witness's)



office, many of them as copies, after they had been arranged with Messrs. Francis, - the whole series of copies, in fact, which was not a small thing in work of that description; neither was the consultation as to alterations of different construction and different forms a small thing. All that work had to be done by witness, who attended at Mr. Gordon's offices, and Messrs. Francis were generally present as well, continually. Though he and Messrs. Francis both prepared different plans in the first instance, those plans were amalgamated. Mr. Francis's suggestion that his firm's design was the one chosen was inaccurate, because the ground story of the elevation was witness's, with certain modifications; while a great deal of witness's design was embodied in the upper part of the building. Witness also exercised very special and constant supervision of the work, especially the foundations, for Messrs. Gordon & Co. in this case were their own builders, hence the necessity for careful supervision, although they had their own clerk of works. Witness denied that there was anything in Mr. Woodward's evidence to the effect that witness had promised to advocate Mr. Villiers's claims as the applicant for the Pavilion site. As a member of the Board, he was constantly being appealed to by friends and brother professional men to give his support to applications in which he had no pecuniary interest whatever; to such applicants, whether for little or big things, he invariably said, "Tell me anything you have to say, and I will give it the calmest and most proper consideration when it comes before the Board." Mr. Woodward was an assistant in his (witness's) office at the time. Witness should consider it improper that he (witness) should act in compensation cases against the Board. Should not consider it proper, either, that he (witness) should take half the fees paid to his assistant for so acting. He believed that Mr. Woodward was thoroughly in error in his evidence on that point. Believed Woodward had the whole of the fees; certainly he (witness) never had half. Without saying that Mr. Woodward had given false testimony, he thought he was mistaken. Cross-examined by Mr. Studd, on behalf of the Inquiry Committee, witness said he was not aware that the London Pavilion projected 2 ft. 9 in. into Great Windmill-street. With regard to Mr. Whiteley's buildings at Bayswater, of which he (witness) was the architect, he did not suggest to the District Surveyor that all he need do was to report to the Board with regard to their alleged non-compliance with the requirements of the Building Act, and that he need not take any proceedings.

Mr. Frederick George Baker, Mr. W. J. Wetenhall, and Mr. W. Shepherd, all members of the Board, were next examined, the last-named gentleman very fully. Mr. Shepherd stated that he was a builder, and became a member of the Board in 1881. He had been a member of the Building Act Committee ever since. Except in very few instances, he was unaware that Mr. Saunders and Mr. Fowler had been advising with reference to plans that came before the Building Act Committee. Mr. George Hill, Mr. Henry Harben, two other members of the Board, were also examined.

Mr. Thomas Verity, recalled, repeated the evidence given by him on a former occasion as to the "Cook Tavern" and as to the "Criterion," and Mr. Saunders's connexion with both, and re-asserted its correctness.

Mr. E. C. Keevil having been examined as to certain suspicious circumstances which had come to his knowledge in connexion with the letting of Board sites, Mr. E. Dresser Rogers, C.C., Mr. John Tolhurst, Mr. John Jones, Mr. John Runtz, Mr. William Debenham, Mr. Alfred Ewin, Mr. G. P. Meaden, Mr. William Robson, Mr. J. E. Bradfield, Mr. T. J. White, Mr. Robert Furniss, Mr. John Abbott, Mr. George Brown, Mr. Robert Jolly, the Hon. A. de Tatton Egerton, Mr. E. R. Cook, Mr. G. B. Richardson (all members of the Board), and several other witnesses were called, including Mr. Hugo Wolheim and Col. A. S. Jones, V.C., who gave evidence with regard to the Board's treatment of suggestions for improving the condition of the Thames as affected by the metropolitan sewage. Mr. J. E. Saunders, Mr. W. R. Selway, Sir Joseph Bazelgette, Mr. Thos. Blashill, and other witnesses were also recalled. Mr. Arthur Gunn, the Accountant of the Board, gave a very clear and lucid statement of the method of keeping the Board's accounts.

In adjourning the inquiry *sine die*, from its twenty-fourth sitting (held on August 14), the Chairman of the Commission (Lord Herschell)

said:—"The Commission, having taken all the evidence which appeared to them material which is at present available, propose now adjourning *sine die*. Before adjourning, the Commission desire to thank all who have assisted them in their inquiry. They would especially express their obligations to the solicitors to the Inquiry Committee for the care with which they have investigated some of the many communications which the Commissioners have received. They desire also to state that they have received from the Metropolitan Board all the information, documentary and otherwise, which they have called for, and that this information has been readily supplied, and without delay."

We believe that the Preliminary Report of the Commission may be expected about the beginning of November.

## Illustrations.

### CHURCH OF SS. PETER AND SWITHUN, WINCHESTER.

THIS church is about to be erected to take the place of the small chapel erected at the end of the last century by Dr. Milner, the well-known antiquarian and historian of Winchester, but which is now quite inadequate to the present requirements. Owing to its interest, however, the greater part will be preserved as a confraternity chapel attached to the new church. This latter, owing to the rapid fall in the ground at the east end, will have a crypt under the chancel, with boys' sacristy, heating chamber, &c., in connexion. There will be a descent into the church at the west end, in order to increase the internal height. The tower in its lower story will contain a chapel, while above this will be the organ chamber, opening into the upper wall of chancel. The style adopted is transition from Decorated to Perpendicular, and the materials used will be flint and stone externally, with tile roofs, while internally Beer stone will be mainly employed. The architect is Mr. Frederick A. Walters, F.S.A.

### TOWER OF SAN MINIATO, FLORENCE.

SAN MINIATO is one of the most perfect and interesting examples of the Romanesque in North Italy. It is of admirable proportions, consisting of a nave and aisles, and dates from the early part of the eleventh century. The windows of the apse shown in the sketch are filled in with semi-transparent slabs of marble giving in the interior a beautiful effect. The Campanile was restored at the commencement of the sixteenth century.

F. T. V.

### THE THIERGÄRTNER-THOR, NUREMBERG.

THE Thiergärtner-Thor, on the south side of the Castle, is one of the many towers of various shapes at intervals on the fortifications. The latter forms one of the most interesting features of the town, consisting of a rampart encircling the city, and still in fair preservation, though some parts have recently been removed.

F. T. V.

### HULL AND SCULCOATES DISPENSARY: NEW PREMISES, BAKER-STREET, HULL.

This building includes a dispensary and a residence for the house surgeon, which are quite distinct, communicating only by a double doorway between the waiting-hall of the dispensary and the staircase hall of the house. The dispensary proper is entered by a doorway in the centre of the street frontage, from which a short passage leads to the waiting-hall, a lofty room 25 ft. by 23 ft., lighted by windows high in the walls, above the surrounding buildings; the seats will be arranged so that patients requiring advice and medicine are separated from those requiring medicine only. Behind the waiting-hall is the consulting-room, with separate doors for entrance and exit, and a dispenser's room or surgery, with hatch opening into the hall, and with drug store attached. The Board-room is immediately to the left of the entrance, with a frontage to the street. The house surgeon's residence is entered by a side doorway, and occupies most of the frontage; it includes dining-room, kitchen, and the usual offices on the ground-floor; drawing-room, two bedrooms, bath-room, &c., on the first floor, and two bedrooms on the second

floor. The materials used are red brick, with dressings of Ancaster stone, the roofs being covered with Broseley tiles. Messrs. Botteri, Son, & Bilson, of Hull, are the architects, the design having been selected from four submitted in limited competition. The work being carried out by Mr. F. Blackburn, of Hull at a total cost of about 1,900*l*.

### ANCIENT STONE CROSS FOUND AT GLOUCESTER.

THE following letter explains the origin of this interesting relic, of which we give an illustration from a photograph forwarded to us by Mr. Medland:—

SIR,—In a recent number of the *Builder*, you gave extracts from a paper on St. Oswald Priory at Gloucester, read by me at the last meeting of the Bristol and Gloucestershire Archaeological Society.

One of the principal points of interest in the paper was a description of part of an ancient stone cross which was recently removed from garden wall in the vicinity of the remains of the Priory. I send you photographs of the stone with the hope that those who have made the ancient stones a special study may be enabled to fix the date and origin of the stone, and suggest the symbolical meaning (if any) of the carvings thereon.

The following notes and suggestions may help to elucidate its history:—

Tradition ascribes the foundation of St. Oswald's Priory at Gloucester to Mervel, the third son of Penda, and Domneva his wife about 660.

Oswald was killed in battle by Penda in 642. When young he lived with, and under the protection of, the Monks of Iona, and through their teaching he embraced Christianity. On his recovery of his kingdom (Northumbria) in 634, he founded a monastery at Lindisfarne, and placed there, as its head, Aidan, one of the monks of Iona.

The stone is of oolitic limestone from the Cotswold Hills, near Gloucester. May it not be that the monks of Iona, or Lindisfarne, sent a skilled artificer to carve and erect this elaborate cross to the memory of their great friend and patron at the monastery then recently founded at Gloucester to his honour?

HENRY MEDLAND.  
Gloucester, August 20th, 1888.

### OLD COTTAGE ARCHITECTURE.—V.

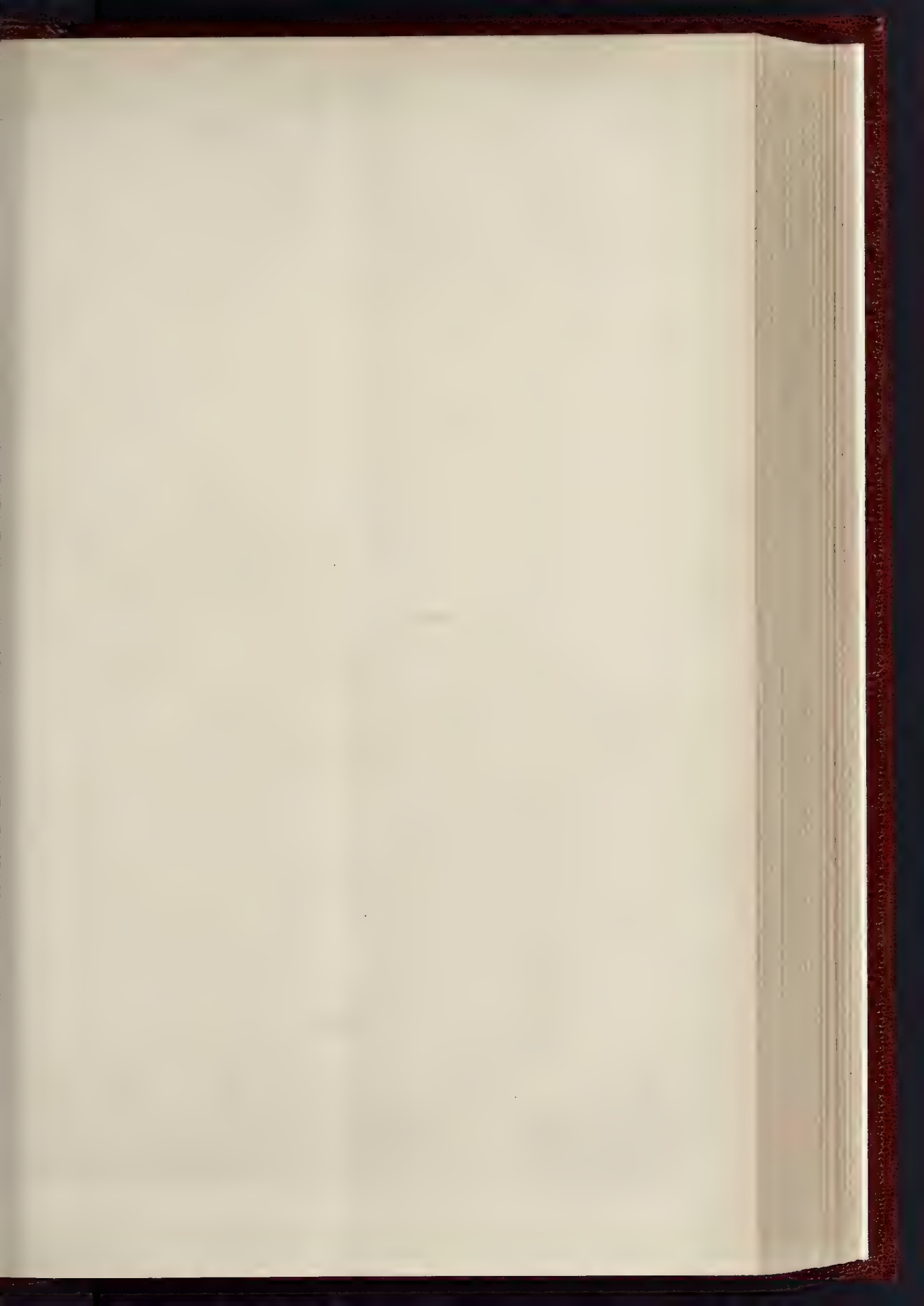
As I have said before, the normal plan of the better house consisted, as described by Mr. Bailey, of a central hall with a passage cut off by an open screen, and of kitchen and office leading from this passage and private rooms on the other side of the hall. In this plan the outside usually took the form of a central hall and gables each side. There is, however, a smaller type, perhaps rather later in date, and of the end of the sixteenth century, in which the plan is of an L or T shape.

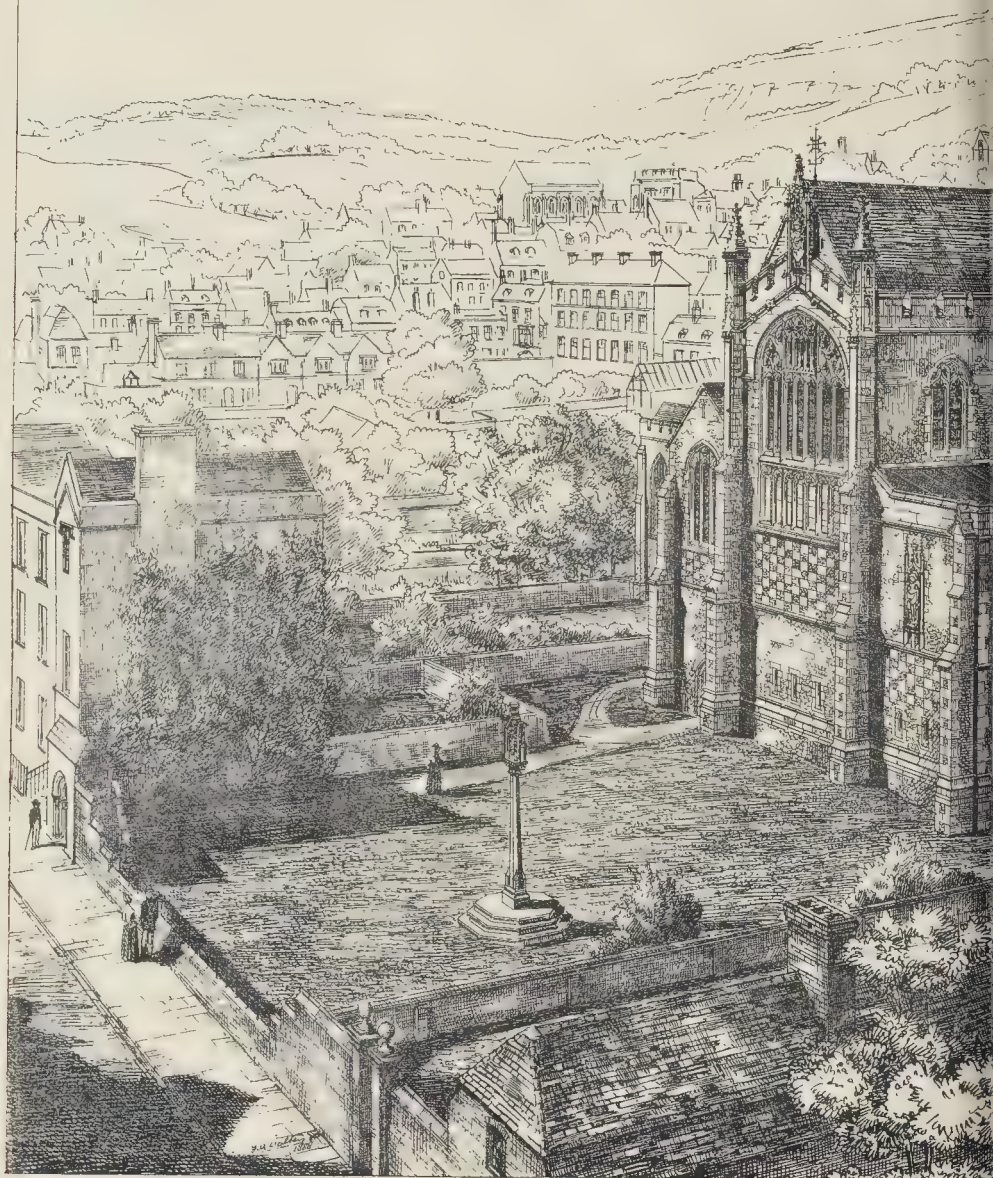
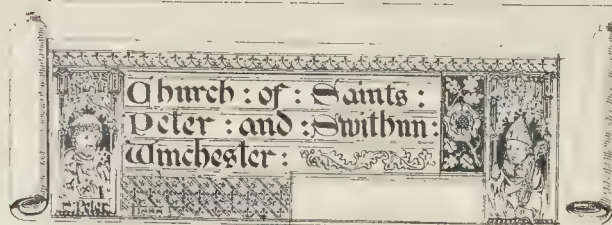
The offices in this case are smaller, and it is probable that what was the hall in older house became the kitchen. At this period the hall ceased to be used as the gathering-place of the whole family and domestics, and we commonly find the old open-roofed halls divided by floor into two or more stories.

I give a plan of Rake House, Milford, of which I gave outside views in my first number of this series (see *Builder*, July 7 last).

The plan is of the original house, as far as it could make it out when restoring it. It has been but little altered, and will serve unusually well as a type of this class of house. The windows on ground floor, except some to offices, are later in date, and the only door that can be positively spoken of as original is that to the small building containing the stairs. As there is no sign of any fireplace in the offices, it is probable that the hall was the kitchen. One parlour is panelled, and has a fine carved mantelpiece, dated 1602, and the other parlour is half-panelled, the top being doubtless originally covered with tapestry. There was the usual state-room upstairs, which probably served as a drawing-room, and in this case had a very fine mantelpiece and panelling. This has in the arrangement been brought downstairs. The staircase in the offices was one of those cut out of solid oak, and led to a small room over the end office; and other stairs, probably replacing a ladder, led from the landing into the roof. This was a good example of what was called the







CHURCH OF S.S. PETER AND SWITHUN, W



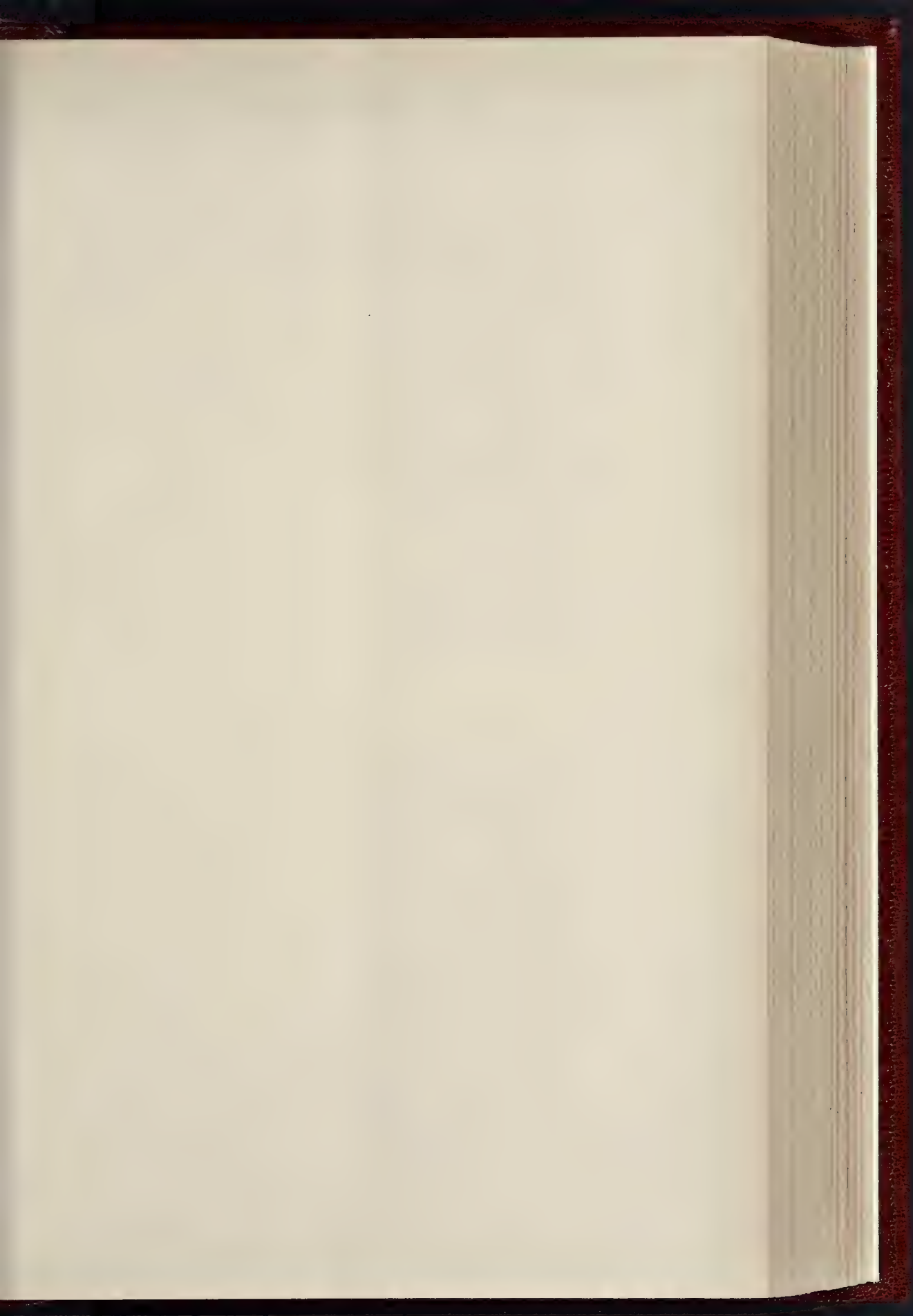


Ground Plan:

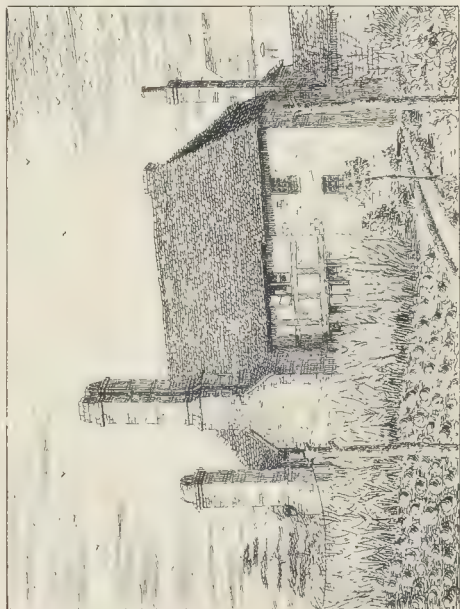
PHOTO L. THU SPRALL & CO 22, MARTIN LANE, LONDON E.C.







THE BUILDER, SEPTEMBER 15, 1888



AT FARNCOMBE



AT A. BURY

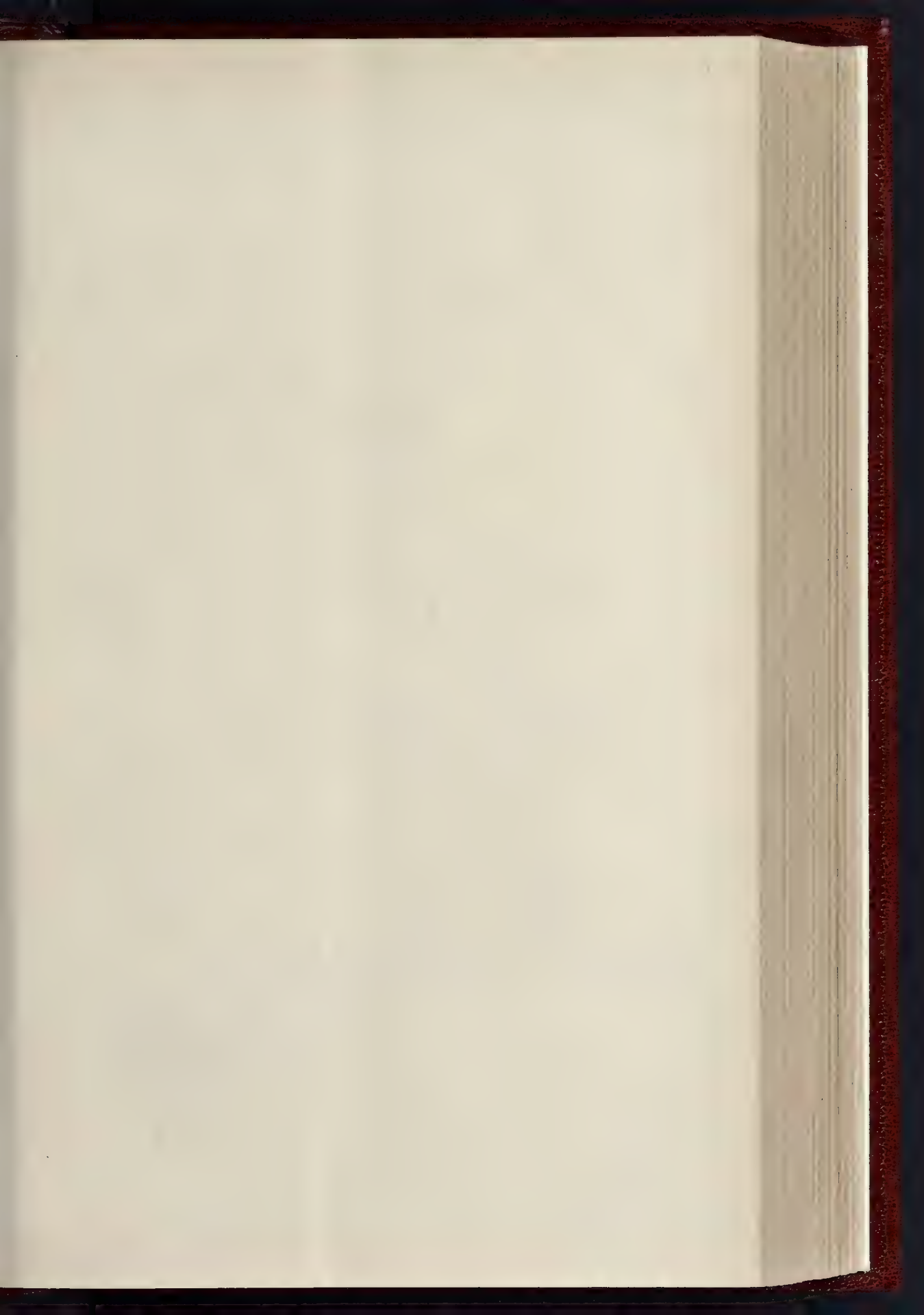


AT FARNCOMBE

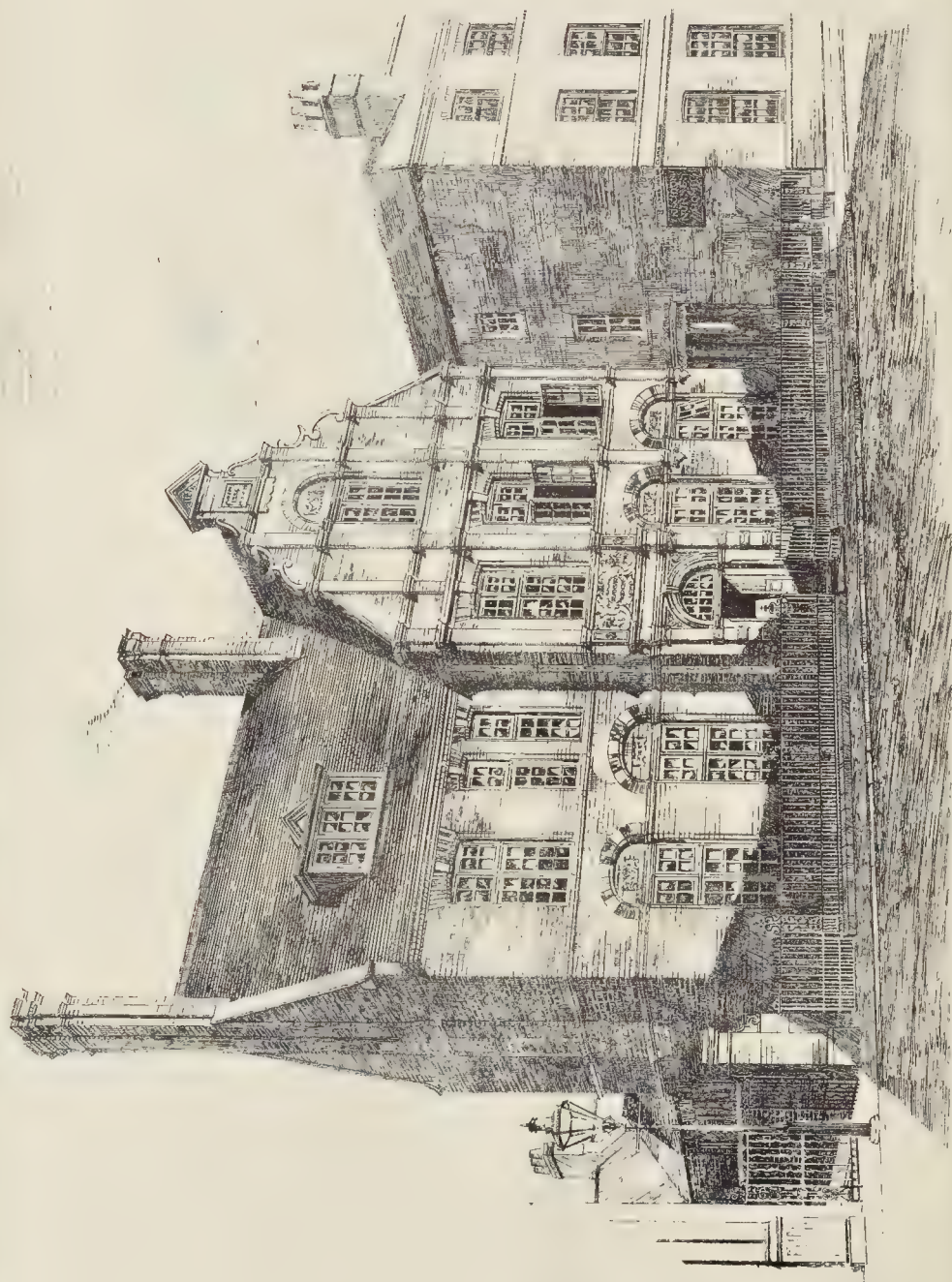


SHOPHOUSE FARM, FARLEY

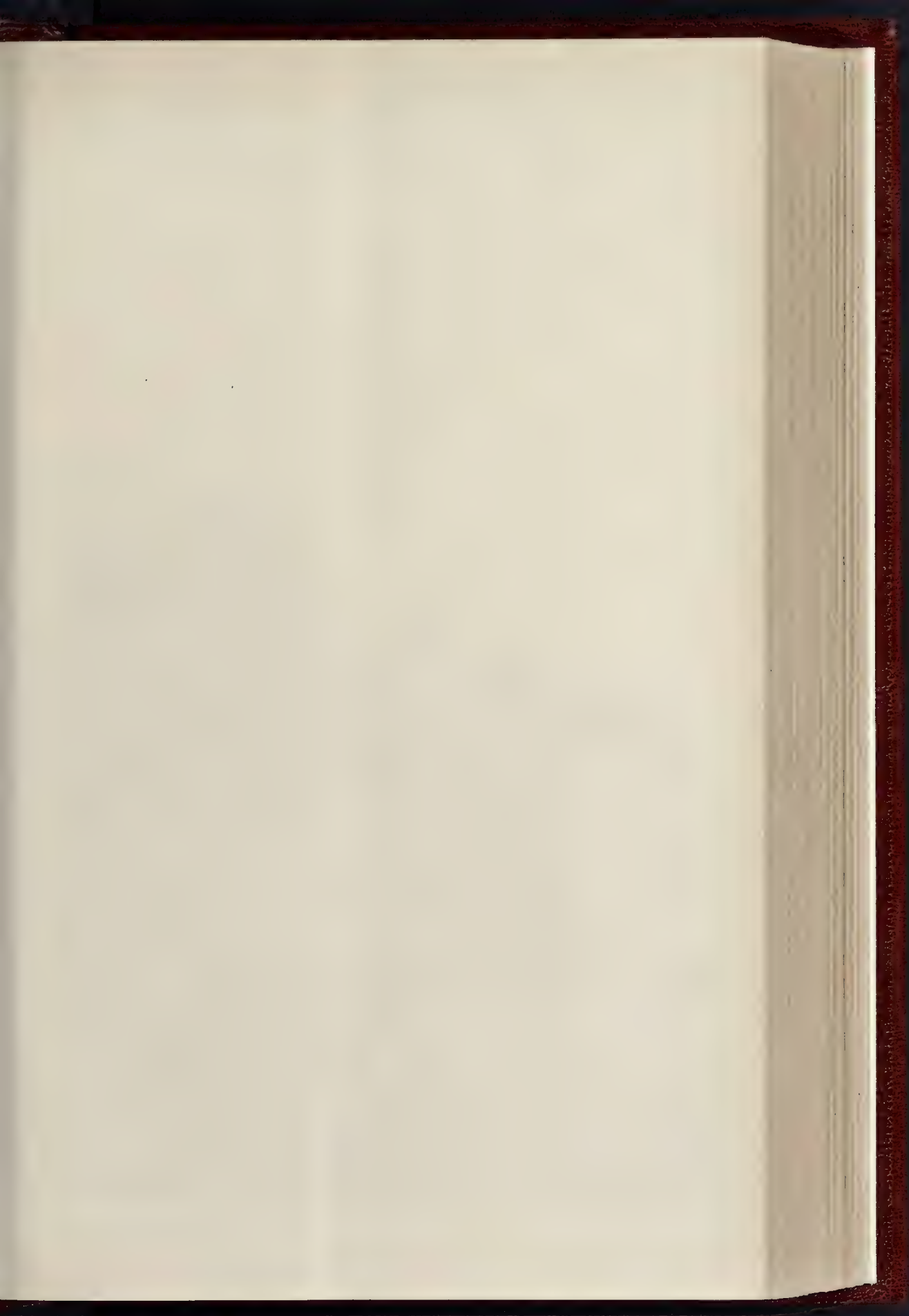




THE BUILDER, SEPTEMBER 15, 1889.









TOWER OF SAN MINIATO, FLORENCE—FROM A SKETCH BY MR. FRANK T. VERITY.





THE THIERGÄRTNER THOR, NUREMBERG.—FROM A SKETCH BY MR. FRANK T. VERITY.







RIGHT SIDE.



FRONT



LEFT SIDE



BACK.







AT CHERI



AT GOMSHA...



PADDINGTON MAN R



NEAR ABINGER HAMMER

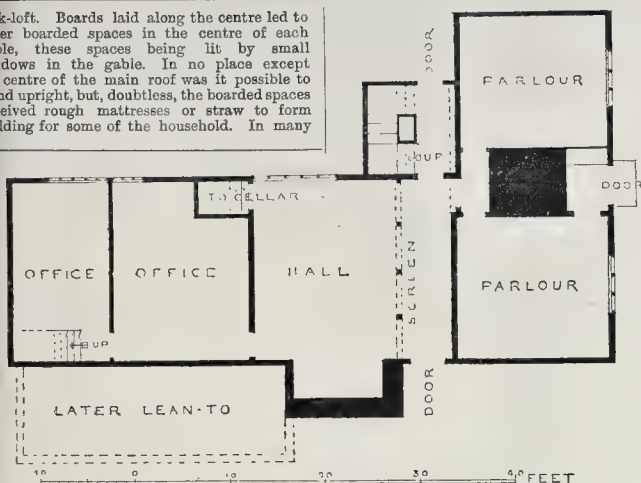
OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.

THE LANCET, 1884, C. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100





lock-loft. Boards laid along the centre led to other boarded spaces in the centre of each gable, these spaces being lit by small windows in the gable. In no place except the centre of the main roof was it possible to stand upright, but, doubtless, the boarded spaces received rough mattresses or straw to form bedding for some of the household. In many



Plan of Rake House, Milford.

of the cottages I have drawn are similar lofts, out of still smaller size. I have no doubt whatever these were commonly used for sleeping-rooms, though at later date they have sometimes been turned into apple-stores and to other uses. In large houses one often finds that the top story, though only partly in the roof and provided with fireplaces, has the roof-timbers unceiled, and nothing but the tiles between the outer air and the room.

At Rake, stone steps led to a cellar containing a well of clear spring water.

The fireplaces had brick Tudor arches, and in the bedrooms over the parlours the sides of these were coated with a very thin coat of hair plaster, on which were painted arabesques in distemper colour. The drawing was of a rude character, and too far gone to be preserved. In this plan the private rooms are on the reverse side of the passage to that usual at an earlier date, owing doubtless to the altered use of the hall. The stairs are somewhat unusual, the newels not showing, but being filled in with plastering, and ending above the first floor with a table top, a rather picturesque arrangement.

The illustrations given this week are mainly close to the village of Shiere. There are many interesting old cottages here coming down from Elizabethan times, when Shiere and Abinger were actively engaged in the cloth trade, for which Guilford and Godalming were centres. Few, however, of these cottages are of sufficient architectural character for me to illustrate, though there are several carved barge-boards and good chimneys. The chimney shown to the Shiere illustration is, I think, the stoutest I ever saw, the shaft being, according to the bricks, 3 ft. 9 in. in the square.

The timber house at Gomsall is of very good character, and it is a pity it has not fallen into hands by which it would be treated with the care and attention it well merits. As it is, what has been done to it is unfortunately out of character. The timber pattern is of circles, as at Bramley and Tangley Manor.

The old house at Paddington has a very good carved barge-board, and the front of the nearer gable, at least, is doubtless of good timber-work, though the whole is hidden by a thick coat of rough cast. This is unfortunately the case also with Narsecombe and the front of Plunk's farm, Shamley-green, which, from the character of the carved barge-boards and the mouldings, both have, without doubt, fronts of good character. As that at Narsecombe faces south, it is doubtless very much perished; but the other two, facing east and north, are almost certain to be in good condition, and it is a great pity their owners will not go to the trifling cost of exposing them to view.

The range of cottages at Abinger-Hammer I have shown, because it is an example very well-known to painters as being particularly picturesque, and is therefore a good example of what I have already pointed out, how little "architecture" is required for this class of building. Part of the roofing here, as elsewhere in the neighbourhood, is of stone slate.

I have been told that some of my examples are not "architecture" at all but "barns." It is precisely the importance of perfectly simple treatment of simple buildings that I want to enforce by the exhibition of old examples, the picturesqueness of which as compared with modern efforts is universally admitted.

The chief feature of a cottage must always be the roof and it is the treatment of this that is all important. Examination of my examples will generally show, besides the general effect, some little particular mode of treatment worthy of study. Another particular feature of the old work I hope to deal with in the perfectly simple but very effective arrangement of the chimneys.

This importance of simplicity has, of course, been perfectly recognised by our leading architects, who have made a special study of old Domestic work, but it is still so far from being generally adopted or approved by architects and still more by clients that I may perhaps be excused for calling attention to it.

R. N.

#### THE PROTECTION OF BUILDINGS FROM LIGHTNING:

##### ARE CONDUCTORS EFFICACIOUS?

At the meeting of the British Association at Bath, on Wednesday, the members of the Mathematical and the Mechanical Sections had a meeting in the St. James's Memorial Hall for the special purpose of discussing the question of lightning conductors. The chair was occupied by Professor G. F. Fitzgerald, President of the Mathematical and Physical Science Section.

Mr. W. H. Preece, President of the Mechanical Section, opened the discussion, and said (we quote from the *Times* report) that if we wanted to know anything about atmospherical electricity, we had to go back to the works of Benjamin Franklin, 100 years ago. Up to 1870 there were absolutely no rules for the guidance of those who desired to erect lightning conductors for the protection of buildings. In that year a great conference was held on the subject, and the result of its deliberations was published in a book, and included a set of rules for the construction of conductors. We had since had great experience of them. He had under his supervision no fewer than 500,000 lightning conductors. Some time ago a lectureship on atmospherical electricity was founded in memory of Dr. Mann, who experimented on the protection of buildings in South Africa. Professor Oliver J. Lodge was selected as the lecturer, but instead of cracking-up the work of the Conference, he took the other line, and if his statements were true, lightning-conductors would be of no use, and no buildings would be safe in a thunderstorm. Professor Lodge had committed himself to fallacies which it was now his duty to bring before the meeting. The Professor assumed that a lightning-rod formed part of the flash. Well, it did not. Nobody had ever seen a flash of lightning strike a conductor. The function of a conductor was to prevent the

possibility of the building being struck by the flash. If it should be struck, there was some defect in the construction of the conductor. Lightning did not go careering wildly about, but passed along a path prepared for it. There was another fallacy, viz., that a flash of lightning was instantaneous. There was no proof of that. We saw a flash of light, which indicated part of the discharge, but how long the discharge lasted we did not know. There were invisible flashes of lightning, which was proved by the fact that persons had been killed under trees when there was no visible flash. He, however, came to that conclusion from the effect on telegraph wires, when there were currents of sensible duration, showing that the flash was not instantaneous. The next part was hardest to discuss. It was the assertion that lightning was oscillatory in its character; that it did not go direct from the cloud to the earth, but went flashing backwards and forwards with considerable frequency. This assertion was based more on mathematical reason than on absolute observation, and engineers had no great respect for mathematical development unless it were confirmed by absolute experiment. The facts against the theory were that electro-magnets were affected for a considerable duration of time by lightning flashes. Iron and steel were affected, and he had heard letters of the alphabet signalled along the telegraph wires by a flash,—the letter R, which needed three signs, C, which needed four, and there was a case on record of G, which needed eight signs. Under those circumstances the flash could not be oscillatory unless the oscillations were very infrequent. A discharge from condensers or Leyden jars might be oscillatory, but they were dealing with flashes of lightning. While he was attacking Professor Lodge in that way, he must say that no one had worked harder or more honestly in the matter. Professor Lodge had made experiments, and they were correct, from which he deduced that the self-induction of copper was greater than that of iron. He also had made similar experiments, but with just the opposite result. There was no doubt the Professor was on the brink of a discovery. He had started a fresh hare which electricians must follow up and kill. Self-induction was called up to explain all the phenomena which they did not understand, and he inclined to think it was very much what the Americans called a bug. In the telegraph science they had known it for many years, and called it electro-magnetic inertia. The next fallacy was that most conductors did not protect any area, but it was known from evidence that they did. He preferred to stand upon the experience of the past rather than upon Professor Lodge's mathematical assumptions. There was a tendency to hasty generalisation among mathematicians, but there could be no doubt that the experiments of Professor Lodge and others were opening their minds to the true nature of electricity, and that they would in time be able to speak of the mechanical character of electricity. They wanted to know where the energy came from which was so destructive in a flash of lightning. Aqueous vapour condensed and falling as rain at the rate of one millimetre per acre per hour developed an energy of 600 horse-power per acre. There was the creation of the energy which only wanted further development to turn into a source of electrical energy. He felt convinced that the result of this discussion would be to establish the truth of the position taken up by the Lightning Rod Conference, and would bring to the front what they were all anxious to see, the true theory of electricity shadowed forth by Professor Fitzgerald in his opening address, and that would make this meeting an epoch in the history of electricity.

Professor Oliver J. Lodge said he had no lightning-conductors under his supervision, and all his conclusions were formed from experiments, and if they were correct very few buildings were effectively and thoroughly protected at the present time; and further, if his views were correct, lightning-rods would in the future cost very much less than now. The term electro-magnetic inertia seemed to imply that they knew more than they did, so he preferred self-induction until they attained to knowledge. Mr. Preece said that no properly-constructed rod ever failed, but in the report to the Conference there were a number of entire failures named. He had made some very careful experiments in which he provided alternative courses for an electric current, and he found that it required less electro motive force to send the current along a thin iron wire than along a



thick copper one. According to Mr. Preece, the object of the conductor was to prevent a flash of lightning, but wires were struck and melted. The conductor had two functions to perform—to act as a point and prevent a flash if it could, and to carry off a flash when it could not help receiving. The electricity above had some energy, and they could not hocus-pocus it out of existence. It might be better to let it dribble away slowly down a bad conductor than to let it rush headlong down a good one. The length of flash was a question for the consideration of meteorologists, and the duration of flashes was a point on which the same gentlemen might do good work. He had seen flashes which appeared to last two or three seconds, but he thought they must have been a succession of flashes. The fact that flashes deflected the compass needle did not prove that they were not oscillatory, nor did it prove anything as to their duration. A short, powerful flash might produce the same effects. There was the question of a flash magnetising a bar of steel. An oscillating current ought not to do that. Professor Ewin used an oscillating current to demagnetise steel. The charging of a Leyden jar illustrated the oscillating current. The charging was like lifting a rod suspended freely at one end to a horizontal position (the rod representing the charge). When the jar was discharged it was like releasing the rod; it must oscillate, and so must the electricity, and its oscillation would vary in accordance with the friction and other modifying causes. The greater the electro-magnetic inertia, the greater the oscillation. With regard to the protection of areas, the area which Mr. Preece admitted he protected was so small that they might give it him without discussion. There was, however, in his opinion no sure area of protection. Mr. Preece might have pressed him hard on the question of the conditions of a flash. He (the speaker) had assumed that the flash behaved as electricity did in an experiment. The cloud, however, was not like the tinfoil of a Leyden jar; it was made up of atoms with spaces between them, and a discharge might be more like that of a splanje jar, or might be dribbled away a bit at a time and not by great rushes. But they could not assume that it would always do so, and must prepare for the occurrence of a great rush. The true character of lightning must be discovered by observing lightning, and not by experiments in a laboratory. The spark of one induction coil at a considerable distance would start another one sparking merely by its light. From that he came to the conclusion that, when there was a very bright flash of lightning it must involve very important consequences. There was no doubt that it would cause discharges all over the charged area, and so he would say that areas of protection were misleading, and if a flash had that effect they had better be without any conductor at all.

The Hon. Ralph Abercrombie, who showed a number of photographs of lightning flashes, said there was no absolute evidence in photographs of flashes of lightning following each other rapidly on exactly the same path. There was, however, distinct evidence of the tendency of lightning flashes to occur parallel to each other. There seemed to be a tendency in lightning flashes to be ramified, to give off threads all round the main flash. Photography gave conclusive evidence that flashes were not so instantaneous as was generally supposed. It showed that the flash did not jump from a cloud straight to the earth, but went meandering through the air and tying itself into knots, so that it could not be so instantaneous as was imagined. He was of opinion that lightning clouds were generally more than 5,000 ft. high, but there was no evidence of one of more than 7,000 ft. high.

Lord Rayleigh said that, although some mathematicians were impractical, yet it was to mathematicians one must go to find the results of known causes under new circumstances. He had no special knowledge of lightning-conductors, but from his general acquaintance with electricity he should say that Professor Lodge's experiments would be a most important practical appreciation to lightning-conductors in the future. Mr. Preece spoke of the development of energy by the condensation of vapour into water, but the question was to find how some of that energy came to take the electrical form. Sir W. Thomson said that mathematicians never predicted that the Atlantic cable could not be laid, but a celebrated engineer did so. He thought Professor Lodge was in the American stage of inertia, and Mr. Preece in

the English stage. He believed that if Professor Lodge proceeded with his experiments he would confirm his discovery that iron wire was a better conductor than copper. Self-induction was in the air, and they were talking of nothing else. He thought Mr. Abercrombie's idea as to the duration was correct. It seemed to him probable that it was the sound of one spark which caused another rather than the light. There was the photograph giving three parallel flashes. It would be well if some experiments could be made to discover whether flashes occurring like that were simultaneous or followed one another, being started by the light or sound vibrations of the first. It was rather startling power over so small an area, and he would like to ask Mr. Preece whether copper had been experimentally proved to be better than iron. They could come to one conclusion from what they had heard, namely, that houses made of sheet iron would be the safest possible places in a thunderstorm.

Professor Rowland observed that the conditions of Professor Lodge's experiments were scarcely the same as those of actual lightning, and he pointed out that the length of the spark was no measure of the resistance of the conductor. Further, he showed some effects in Mr. Abercrombie's photographs which were probably due to the astigmatism in the lens of the camera.

M. De Fonvielle, who spoke in French, said he, with Mr. Preece, was a supporter of the old lightning-conductor theory, and he was partly led to that state of mind by the fact that there were large numbers of accidents in Paris, and there was very seldom an accident caused by lightning. The large number of lightning-rods in a city could not fail to protect the city generally from the effects of lightning, and to help in discharging a thundercloud passing over it.

Professor George Forbes said that Mr. Preece did not mean to say that mathematicians came to wrong conclusions when they had all the right data, but that they sometimes came to a conclusion without taking all the data into consideration. Professor Lodge had come to say that if iron was not better than copper, it was at least as good; but they could not be quite prepared to accept that, because the experiments might be tried in instances more nearly approaching the natural conditions, and in that case they believed copper would be found to be the best.

Sir J. Douglass said that his experience of lighthouses protected by lightning-rods covered a space of forty years, and was comforting to the members of the Lightning Rod Committee. He never knew a rod fulfilling the conditions he prescribed to fail in protecting the lighthouse.

Mr. G. J. Symons said he had investigated every accident by lightning of which he could hear, and had so got valuable experience. The conclusion left on his mind was that if people would erect conductors precisely in accordance with the rules laid down by the Conference, and fulfilling all the conditions, they would be absolutely safe. Where accidents occurred to buildings with conductors, there was a reasonable explanation to be found. Professor Lodge's experiments were laboratory experiments, and to get the real facts they must have something on a much larger scale—perhaps by a series of interrupted conductors on the tops of some of those high hills where storms frequently occurred. With regard to protected areas, there were only two cases on record, and those doubtful, of anything being struck within a protected area.

Dr. Walker said he saw an obelisk on top of a hill struck. The top was knocked off, and the fluid came from the steps of the monument at fourteen different points, ploughing up the ground, and breaking rock at 100 ft. distance.

Professor Lodge said he could not understand why a conductor should have such a good earth. Why did not three points do at the bottom as well as at the top? If properly-constructed conductors never failed, how was it that the hotel at Brussels was burnt, for that was considered protected in the most orthodox way? He would not say that conductors were of no use; they were of great use, but not absolutely certain. In his experiment he was bound to adopt the plan he did, because the experiment could not be done in any other way. It was only the outer surface of the conductor which conducted, and he did not know that there was any good in the centre of a rod. A tube would do as well, and would be all the better if opened out into a flat bar, and yet better than that would be a strand of wires. Iron buildings, to

be safe, must have perfect connections, for the smallest gap might give off a spark. That was the danger in houses supplied with gas; if the fluid travelled along the pipes and came to a gap a spark and explosion might result.

Mr. Preece said the points between Professor Lodge and himself were reduced to a very small compass indeed. He himself had always been a great advocate of iron on account of its cheapness. The use of copper caused needless expense in the erection of lightning conductors. He believed every private house could be protected in accordance with the recommendations of the Conference for 1*l*. If people would buy a coil of stranded iron wire a quarter of an inch in diameter with the final points, and have that put up.

The president summed up the discussion, and said the principal thing for them to pay attention to was that prevention was better than cure. There could be very little doubt that the presence of a considerable number of conductors afforded a great deal of protection to the area in which it existed, as was shown in the instance of Paris. It was desired, if possible, that the whole country should be covered with conductors to prevent the discharge of flashes. There was no doubt that, though there might be room for improvement in the conductors, they had on the whole been right.

#### THE TRADES' UNION CONGRESS AT BRADFORD.

SOME points of the proceedings at the twenty-first yearly Trades' Union Congress, held last week at Bradford, may here be put on record. Mr. H. Broadhurst, M.P., read the report of the Parliamentary Committee, which contained the following passage:—

"During the past year the issues from the Board of Trade have been of some importance, but have not, perhaps, been sufficiently circulated to receive the attention they deserve. A large volume of wages statistics, historical in character, and ranging back from 1856 to 1880, is interesting, as illustrating the vicissitudes of wages during that period, and also as showing the industrial revolution through which many trades have passed. A glimpse has also been afforded of the miserable condition of many of our fellow workers in Belgium by the publication through the Board of Trade of a volume of statistical and other information as to the wages and general conditions of the Belgian workers, translated from the report of a Belgian Commission of Inquiry. But the work of the department under notice most valuable to us as working men has been the reports of the Labour Correspondent on Foreign Immigration and the sweating system in the East End of London. The general attention that has been called to the evil of the sub-contract system through the facts that have been brought to light with regard to it have more than vindicated the accuracy of the report of our late colleague, and the Congress has reason to congratulate itself upon these further results of the appointment of practical workmen to take part in those departments of the work of the State which apply and belong exclusively to the labouring classes. Labour has been received from most influential quarters as to the diversity of the questions dealt with by the Congress and the recent tendency to drift into political and controversial subjects outside the scope of Trades Unions. The complaints are not exceptional and incidental; they are both numerous and important, and cannot therefore be ignored. The Congress is a non-political body, and its deliberations should be confined to strictly trade questions. No progress has been made with the question of a further increase in the staff of Factory and Workshop Inspectors, the Government giving as a reason for declining to consider it that they prefer to await the report of the Committee that has been appointed to inquire into the sweating system. We congratulate the trades on the comparative industrial peace experienced since our last meeting. No great national labour contest has occurred to strain the resources of our Unions, or to disturb the relations between capital and labour. We think that, on the whole, trade has improved, and that no general strike has been made here in wages; but, on the contrary, there has in some industries been a tendency for the rate of wages to increase."

The President (Mr. S. Shaftoe) in his inaugural address, said that

"Whatever Trades Unions had won, they had secured by their force of justice, by their action, by their political power, and by their influence on public opinion, their demands being focussed by the Congresses. Whatever generous sentiment might animate any action of the possessors of capital, they could not alter the character of capitalism. Economic forces were working against humanitarianism; capitalism, in its struggle to acquire more, would work labour fifteen or eighteen hours



day, and expect it to live on almost anything, as against this tendency that Trades Unions hit, and their Congresses had obtained many able victories. Thus they could point with a to the Factory Acts of 1874, 1878, and 1883; the Employers' Liability Act, the Truck Act, and the Regulation Act. These were but a few of the sure remedies by the Congresses; they were, however, sufficient to act as landmarks in the elevation of the people. But hard though the struggles of Congresses had been, those of the future would be equally keen, for they could not remain satisfied with the projected Employers' Liability Act or the Mines Regulation Act; they could not remain idle, as millions were spent on useless wars, while on the one side the competition of new mechanical inventions, and on the other a continuously increasing population. Both these rendered the problem of life more difficult. After pointing out the general effect of the introduction of machinery during the past forty years had been to cut a saving of labour to the extent of 40 per cent. in the production of any given article, he pointed out the necessity of a reduction in the hours of labour, and there had been a rapid growth of opinion in favour of an eight hours day. Strong reasons existed for applying such a system to miners, railway servants, who had claims for consideration not usually found in other trades."

#### *The Inspection of Factories and Workshops.*

Mr. Birtwistle (Accrington) moved the following resolution:

"That the views with considerable alarm the violation of the Factory and Workshops Acts are daily being placed in various parts of the country, and instructs the Parliamentary Committee to make a special effort to see that Parliament to appoint a considerable additional number of practical persons as Factory and Workshops inspectors."

He argued that under present conditions it was impossible for the inspectors to attend properly to their duties. What was mostly needed was considerable augmentation of the number of inspectors already appointed. They did not seem to be men of their own class appointed exclusively to these positions; but they did not seem to have practical men, who knew their business, whether managers or anything else. They should like a fair proportion of them to be drawn from the working men.

Mr. C. Freak, London, seconded the motion, which was adopted.

#### *The Employers' Liability Bill.*

Mr. J. S. Murchie, Manchester, moved the following resolution:—

"That this Congress desires to express its strong disapproval of the Employers' Liability Bill, and instructs the Parliamentary Committee to make a special effort to see that Parliament to appoint a considerable additional number of practical persons as Factory and Workshops inspectors."

Mr. S. Woods, Wigan, seconded the resolution, and contended that no Bill should be accepted which allowed employers to contract away their responsibility.

Mr. Broadhurst, M.P., suggested that after the question has been discussed, a memorial should be drawn up and signed by the delegates present, and that a committee should also be instructed to make arrangements for a deputation to wait on the Government representative all parts of the country and all trades. They should need all the influence they could get in every quarter, and they would have to put the utmost possible strain on their representatives in Parliament in order to make the Bill worthy of acceptance. It was their duty to stand their rights, and to never rest satisfied until they were granted in their most complete and absolute form. The present Act was far inferior to the proposed one.

Mr. John Wilson (Durham) supported the resolution.

A desultory discussion ensued, in the course of which Mr. Murchie suggested the following addition to the resolution:—"And that the proposed limited extension of the Act to seamen is entirely inadequate, and does not meet the fair and just claims of the workmen employed at sea."

Several delegates supported the suggestion.

Mr. Thomas Burt, M.P., on the suggestion of Mr. Threlfall, was invited to address the Congress on the subject. He said that the labour representatives had never been favourable to workmen contracting themselves out of the Act;

and it was important to remember that before that could be done the workman must have made a request in writing. As to insurance, they had never opposed employers protecting themselves in that way; but it was another thing altogether to expect workmen to be parties to giving up claims that Parliament had already declared them to be entitled to.

The resolution, with the addition suggested, was then agreed to.

On the proposal of Mr. Pickard, M.P., seconded by Mr. Jenkins (Cardiff), a memorial to the Government was adopted, calling attention to the inadequate nature of the Employers' Liability Bill, and urging the desirability of so amending the Bill on the report stage as to bring it within the reasonable requirements of those whom it seeks to benefit. The memorial points out that Clause 1, as it now stands, leaves the law of common employment in full force, to the great injury of and injustice to the working classes; that Clause 3, enabling employers, upon certain conditions, to contract themselves out of the Act, is open to objections, not only from the workman's point of view but on grounds of public policy, that are numerous and insuperable. As to Clause 9, the memorialists acknowledged the liberality of the Grand Committee in increasing the lump-sum amount recoverable in Clause 9 from £150 to £250, but they contended that the proposal to make it £500 is only reasonable; even then it is but a compromise with the justice of the case. Clause 12 (imposing upon the common-law rights of the workman to sue his employer for negligence the conditions as to notice, limitation of time, &c., by which the Act regulates the statutory right of action which it confers) was described as a most objectionable proposal. Clause 13 was recognised as an admission that seamen have rights to compensation, but the memorialists do not admit that the clause, to any appreciable degree, satisfies those rights, as the Bill makes it a condition that the "defect" must have existed at the time when the ship last proceeded to sea from a port in the United Kingdom. It would appear from this wording that the moment a ship has entered a foreign port the protection to seamen ceases. The memorialists ask the Government to omit the words named, as an injury received coming home is equally entitled to satisfaction as an injury received going out.

#### *The Eight Hours' Question.*

Mr. J. Maunsley (Manchester) submitted the report of the Parliamentary Committee on the *plébiscite* as to an eight hours' day. It stated that in summarising the whole of the returns it was impossible to give a definite opinion as to which way the balance lay, as the number of the votes returned was so small, and it was consequently open for any one to put the opinion of those members who had not voted on which side they chose. A perusal of the returns would, however, be sufficient to satisfy any unprejudiced person that the time had not yet arrived for commencing an agitation for the eight hours' day.

A short discussion ensued, and it was suggested that the report should be printed, so that the delegates might have the figures before them previous to voting on the motion for the adoption of the report. This course was agreed to.

Subsequently, Mr. J. Keir Hardie (Ayrshire) moved that the question of the eight hours' day be referred to the Parliamentary Committee, with instructions to take a vote of the trades on the following issues: First, "Are you in favour of an eight hours' day?" Second, "Are you in favour of its being obtained by Act of Parliament?" Only those who answered the first question in the affirmative to be allowed to vote on the second question.

Mr. Stevens (Birmingham) seconded the resolution, which was adopted.

#### *Deductions from Wages.*

Mr. Drummond (London) moved:—

"That it shall not be lawful for any employer, or his agent, to make it a condition of the hiring that a workman's wages shall be liable to deductions from any fund, or to any benefit, charitable, or provident institution, from which a workman is not entitled to derive any benefit after he has ceased to remain in that employment. No deduction shall be made from a workman's wages for any work, materials, machinery, or tools which may have been spoiled or injured by him in the course of his employment, nor shall it be lawful for an employer to make it a condition of the hiring of a workman that he is willing to hold himself responsible for any such spoilage or injury; provided always that such spoilage or injury has not been brought about by any act wilfully committed by the said workman himself, or in concert with any other person or persons. No deductions shall

be made from a workman's wages for any time he may lose when employed upon piecework, nor shall a workman employed upon time be liable to have deducted from his wages more than the actual value of the time lost at the ordinary rate of wages of the said workman. No deductions shall be made from a workman's wages for any fines imposed by an employer or his agent for any purpose whatsoever; nor shall it be lawful for any employer to make it a condition of the hiring that such fines may be imposed."

Mr. Bloor (Burslem) seconded the motion.

Mr. Wilson (Sunderland) asked that the resolution should include seamen, and this was agreed to.

Mr. George Silk (Oldham) moved, as an amendment, that the resolution end with the first sentence. The rest, he said, was merely a trade question, and he made his suggestion on one of the first principles of trades unionism, that they helped those who helped themselves. Mr. Mellor (Oldham) seconded the amendment.

Mrs. Cooper (London) suggested that women should be included among the workers, and this was agreed to.

Mr. Silk's amendment received little support, and the resolution was carried.

On the suggestion of Mr. Abrahams, the mover of the resolution agreed to strike out from the first sentence the words "from which," to the end of the sentence.

#### *Joint Boards of Employers and Workmen.*

Mr. Wardley (Sheffield) moved:—

"That this Congress is of opinion that the formation of joint boards, composed equally of employers and workmen, is very necessary, and would bring about a better understanding between them, and secure settlement of vexed questions affecting the interest of both, and urges the workmen of the large centres of industry to bring the matter before the Chambers of Commerce and other bodies of employers, in order to facilitate the formation of such boards."

Mr. Holmes (Leicester) seconded the resolution, and remarked that the appointment of such boards would tend to prevent strikes.

The resolution was agreed to unanimously.

#### *Registration of Trades Unions.*

On the motion of Mr. A. Wilkie, seconded by Mr. J. Heslop, it was resolved:—

"That it be an instruction to the Parliamentary Committee to secure an alteration of the Registrar's regulations, or, if necessary, an alteration of the Acts, so that the registration of a Trades Union registered in Scotland under the Trades Union Acts, 1871 and 1876, shall apply to and be valid either in England or Ireland, should in any case its general office be removed to either country, or vice versa as the case may arise, and terminate the present inconvenient and expensive system, that when a general office of a Trades Union is removed from one kingdom to another the registration of the rules must be cancelled in the one and re-registered as a new association in the other."

#### *Picketing by Men on Strike.*

Mr. Kell (Leicester) raised a question as to whether picketing by men on strike is legal under the "Conspiracy and Protection of Property Act, 1875," remarking that according to the ruling of the Judges peaceful picketing is illegal. He moved:—

"That this Congress is of opinion that the definitions as given, and the interpretations of the above Act by Justices Stephen and Hawkins are contrary to the intentions of the framers of the Act, when placing the same as a statute, and as defined by Mr. Secretary Cross in a circular to the magistracy. Further, this Congress instructs the Parliamentary Committee to take such action as may be deemed necessary to ascertain the true meaning of the Act."

Mr. G. Rogerson (Leeds) seconded the resolution, which was carried.

It was resolved to hold next year's Congress in Dundee.

#### ARCHES, NAVE TRIFORIUM, BEVERLEY MINSTER.

Sir,—Last year I carefully measured the arches at the back of the nave triforium to which Mr. Littlehales refers in his letter in your last issue [p. 183], and I quite agree with him that there is no ground whatever for the supposition that the vousoirs ornamented with the zigzag are in their original position. To say nothing of the structural impracticability of retaining those arches while the later work was being constructed below, around, and above them, there is every indication that the arch-stones are simply old materials from the Norman church worked up again in the fourteenth-century work.

Their situation, however, is interesting, as throwing some light on the history of the building. The back of the triforium throughout the church shows in each bay a single semi-circular arch between the square buttresses, the form of the arch being here no indication of early work, but simply the most convenient form for the purpose. The arches which have the zigzag ornament are the second and third westward of the crossing on both the north and south sides of the nave—i.e., the first two bays of the nave, which was added in the fourteenth century to the Early English choir and transepts; indeed, on the north side the rough toothings which



finish the thirteenth-century work can still be seen. The fourth bay from the crossing on the north side has a single stone with the zigzag ornament worked upon it at the eastern springing of the arch. Both this bay and the two or three bays immediately to the west have a Norman roll-string course walled in just above the vaulting of the aisles. This string does not occur on the south side, where the Norman work is confined to the arch-stones of the second and third bays from the crossing. The zigzag is formed by sinking a moulding in the face of the stone on each side of the angle, the angle itself being square, not serrated, as is more usually the case.

The choir and transepts were commenced after the fire of 1188, and completed in the first half of the thirteenth century, and nearly a hundred years seem to have elapsed before the nave was commenced. It appears probable that the Norman nave was left standing until the works were resumed in the fourteenth century, and it would then be very natural to re-use old materials in such a position as the back of the triforium. The span of the arches in question (9½ to 12 ft.) shows that the arch-stones must have formed part of the main arcade of either the ground story or the triforium of the Norman church. Two arch-stones, ornamented in exactly the same manner, were found in cutting a hole through the wall of the south choir aisle (Early English work), which would indicate that the church which immediately preceded the present structure was of one date throughout. Possibly it resembled the earlier bays of the nave of Selby, the arches of which are of about the same span.

Hull, Sept. 10.

JOHN HILSON.

#### ANCIENT INSCRIPTION AT KENDAL.

Str.—The reading of the inscription referred to by your correspondent [p. 183, ante] should be as follows:—

"Esto porta patens, nulli claudaris honesto."

It is a motto of frequent occurrence on ancient doorways. It is interesting from the fact that it depends upon where the comma be placed to have a wholesome or sinister meaning, for if the point follow *patens*, it signifies "This door must be open, to no honest man let it be shut"; but if the point follow *nulli*, it reads, "This door must be open to no one, to the honest man let it be shut."

It may be of interest, likewise, to your readers to add that the origin of the French proverb, "Ponr un point Martin perdit son âme," arose, 'tis said, with regard to an error in the punctuation of the motto, for an Abbot of Asello, named Martin, had it placed over the abbey gateway, with the stop apparently very boldly cut after "nulli." Legend adds that the Pope, seeing or hearing of it, suspended the Abbot, deeming such an error to indicate either a spirit contrary to monasticism or an illiterateness nearly as blameful.

So, if a person lose a good thing for a trifling cause, he is said to have acted like Martin, who lost his ass for a trifle.

A. E. P. RAYMOND DOWLING.

Stedmere, York.

### The Student's Column.

#### ARTIFICIAL STONES.—XI.

Concrete (continued).

WHEN Whibley's specification (1860, patent 3,003), the importance of using lime while still hot is insisted on; this is to be mixed with about 3 parts of sand, gravel, shingle, or ordinary dry rubbish, and then sufficient water added, and the mixture placed in moulds or frames to set.

Very frequently we meet with a recognition by patentees of the fact, too often overlooked by rule-of-thumb operators, that the amount of water used must be kept down to the lowest possible limit if concrete or stone of maximum density and strength is desired. It may be considered, then, a generally applicable rule, that only just sufficient water should be added as will enable the cement to hold the aggregate together.

In some patents the point of novelty is the addition to the water used of certain acids or salts capable of reacting on the cements or other ingredients used in the formation of the concrete. J. Bégué, in 1864, considered, for example, that a mixture of 2 parts of urine and 1 part of salt mingled with 20 parts of "common earth," fine sand, potters' clay, peat and coal, constituted a valuable stone-forming mixture. A more ornamental stone, according to the same inventor, was made up of 33 parts of pulverised bottle glass, 66 parts of clay, 1 part of porcelain clay, and the whole diluted with urine or a mixture of salt and urine. This patent is an example of the putting together of a number of

ingredients with the only object, apparently, of introducing sufficient novelty to secure protection. The addition of salt to the mixture could only result in the formation of a damp-attracting stone, and urine has only nastiness as its quality in such a connexion. If the small proportion of phosphates and other salts in such a fluid is of any real assistance, they might be added in a far less objectionable manner than the one proposed.

W. Kirrage in 1865 added to the mixture of sand, gravel, cement, &c., a solution of sulphate of iron in water. In this case the sulphate of lime formed assists in increasing the binding power of the cement, and the hydrate of iron simultaneously produced is also valuable in this direction, but imparts to the stone a brown colour.

Setchell preferred to add water and hydrochloric acid to a mixture of gravel, broken stone, or brick ballast, to which had been added Portland cement, iron filings, or slag. The iron filings are acted on by the acid, the chloride being formed, and this, decomposed by the lime salts present in the mixture, produces basic carbonate and hydrate of iron, increasing the density of the resulting stone. Unfortunately there will be formed at the same time the very deliquescent chloride of calcium, which neutralises to some extent the advantage gained. It would be well if patentees would avoid, whenever possible, the addition of chlorides to stone-forming mixtures; such additions almost invariably prove ultimately to be a source of weakness, and detract seriously from the reputation of an otherwise good stone. It may be, as some contend, that the proportion of chloride of sodium or salt in sea sand is so small that it constitutes no sufficient excuse for the rejection of this material in mortar-making; yet it is this small proportion that has caused it to be rejected in favour of river or other sand by the conscientious builder.

In Robertson's patent (1874, pat. 2,047) this undesirable formation of a class of soluble compounds in the body of the stone is again effected. The matrix, as the inventor calls it, is made up of gravel, shingle, stones, glass, burnt clay, and like materials, either separately or mixed, and is tritinated with water, making in solution either a chloride, bromide, iodide, or fluoride in saturated solution, chloride of calcium being preferred. The material so treated is subjected to high pressure, redipped in solution, and allowed to set on wet sand-beds. Drevet's "Béton Français" is composed of sand or river mud, hydraulic cement, and marine salt, this last being the point of novelty, and a most objectionable one.

A patent which deservedly received "provisional protection only," in 1875, was a remarkable instance of the astounding groping about in the dark which characterises the labours of some would-be patentees; in this case, with the object, as the specification describes it, of neutralising the quick-lime, which causes artificial stone made with it to crack after a time, "azotic" acid is added to the water used for making up the stone. This is truly a case of "save me from the doctor," for a destruction of strength directly proportional to the amount of acid added, and the formation of soluble nitrate of lime, which would form an unsightly efflorescence on the surface of stone so treated, would inevitably result.

**The Strike of Joiners and Carpenters in Leeds** has terminated. On the 7th inst. an interview took place between the deputations respectively appointed by the Leeds Master Builders' Association, and the workmen who have been on strike, to further consider terms upon which the dispute might be terminated. Mr. Craven presided, and was supported by Messrs. Irwin, Tomlinson, Nicholson, Mawson, and Thorp. The deputation from the operatives' associations consisted of Messrs. Pallister, Thompson, Stell, Goodson, Wilson, Sewell, Loft-house, and Knowles.—The masters now submitted for consideration an amended code of rules, the first and most important regulation being altered so as to read as follows:—"That carpenters' and joiners' wages be at the rate of 7½d. per hour for skilled workmen." These terms were accepted by the men on the condition that they were in future paid time and a-quarter for the first two hours' overtime, and time and a-half for every subsequent hour. Also that walking time be allowed as arranged before the strike.

\* A very antiquated term, applied to nitric acid.

### Books.

*Histoire de la Céramique Grecque.* Par OLIVIER RAYET. Professeur d'Archéologie à la Bibliothèque Nationale; et Maxime Collignon, Chargé du cours d'Archéologie à la Faculté des Lettres de Paris. (Paris: Georges Decaux, 7, Rue du Croissant. 1888.)

THE book before us supplies a want long felt. The study of Greek Ceramography has of late years advanced with strides; not only have new stores of material been added, but the whole method of the subject has undergone a complete revolution. Greek vases when first discovered were regarded as things of elegant shape and curious decoration, materials for the artist and antiquary; next, very slowly dawned upon the archaeological world that they are a storehouse of information as to mythology and ancient life; last, and quite late, they have come to be studied for themselves, as a branch of Greek art, well deserving the attention of the specialist. It was an uncommon thing to find a first-rate archaeologist of the past generation treating vase paintings as merely an elegant form of illustration of the legends left us by Greek poets, an attitude which the mere atmosphere of modern archaeological thought renders wholly impossible.

As soon as a subject has taken real hold of a professional mind, as one of independent value and wide-reaching interest, the next step is to be nowadays an attempt to present the subject, its method, and its interest, in readable form to the general educated public. As a further, it may almost safely be predicted that the attempt will be made by a Frenchman, M. Rayet, England we have, indeed, Birch's "Ancient Pottery," published in 1857, a book admirable in its day, but now practically obsolete. Still that date, if we in England have learnt anything new about Greek vases we have not dared to tell it, save in the ear of the specialist. Germany, always ahead in investigations, suffers from a national incapacity to popularise. A handbook of Greek Ceramography, by M. Furwängler, has long been looked for, but is not forthcoming yet. As he has lately been seen in the British Museum examining the Naucratis fragments, we may hope was with intention. At present Messieurs Rayet and Collignon hold the field undisputed. The book was originally projected by M. Rayet alone. He had many qualifications for the task; he was well known as an amateur collector, his lucid, easy style had been proved in his popular "Monuments de l'Art dans l'Antiquité." His work was, however, cut short by the distressing illness that ended in his death in February year. M. Collignon, at the desire of M. Rayet's family, completes the book. He may say at once that the chapters by M. Collignon are pure gain; they bring the book up to date,—a matter in which M. Rayet's portion is necessarily somewhat deficient. To M. Collignon is due the excellent "Introduction" on the technique of vases and the places of their fabrication, and their subsequent commercial distribution. Nothing could be more admirable than this chapter; and no chapter was more necessary. It is in the close study of technique and of material, and the tracing out of trade routes and the like, that the great advance has been of late made in the subject. This introduction,—as, indeed, the whole book is most amply and judiciously illustrated,—have, from vase paintings themselves, two scenes in the studios of potters by which every stage of the process is illustrated; a potter stoking his furnace, a view of the vases baking within, another of a merchant-ship with a cargo of pottery, the method of packing,—which seems somewhat unduly slight; and last, and perhaps most instructive of all, a fragment from the Sévres Museum in which the painting of the ground of a red-figured vase is only half filled in.

Speaking generally, the book does not disappoint its promise. It is very full and very clear, with that subordination of detail, the compactness of form, which seem to come by nature to the French. Any one who reads the book through will get a good general notion of Greek pottery of all periods, from the rude shapes of Troy belonging to—well, it is so not to say what century—down to the latest efforts of the Greco-Italian school; he will moreover, learn incidentally a great deal of subject-matter of vases, and nearly all that is known about the manner of particular vase-painters. He will have clearly brought before him the geographical distribution of vases, as



characteristics of the most important centres of civilization; and he will conclude with a brief chapter on the "Ceramics of Architecture." He will have for reference 16 beautiful red plates, and 145 for the most part of woodcuts, all chosen with great judgment. While on the subject of illustrations, must enter one protest. Why is a vase of this kind—say it without hesitation—the beautiful in the world—the Aphrodite from Cameiros in the British Museum—to be constantly reproduced in a manner which is simply a parody? We were not surprised to see this odious plate appear some six months ago in Baumeister's "Denkmäler"—the price of the book precludes any thought after perfection—but that it should appear in a French publication (pl. 10) which is not *de luxe* is too much. To atone—if argument were possible—we have some additional which will be welcomed even by professional archaeologists, notably two new vases, the Kachrylion.

Looking at the book from the specialist's point of view, which is unavoidable, there is much that might be altered with advantage. The popular purpose of the book compels a certain dogmatism. Everything cannot be discussed in a book of this sort; but how does Mr. M. know for certain that the vases of the Athenian style, inscribed in Corinthian letters, are found at Tarquinii and Caere, are "d'une civilisation Corinthienne transplantée en Italie"? The statement is a mere assumption, though only an interesting one. There is much to be said, notably the influence that these very vases, supposed to have been made in Italy, had on the vases of the Athenian style. This class of vases should certainly not have been dealt with apart from the Athenian plaques, which are numbered from 1 to nearly one hundred pages. Then, again, what have the all-important classical vases known as Chalcidian done that they should be simply omitted altogether? What theory we incline to as to their "provenance," they are not a class that we can afford to neglect. Speaking of the fragments of red-figured pottery found on the Acropolis by Ross, the text says:—"Il était bien évident que des débris dans ces travaux une indication 'céramologique';" but, alas, he, and many others, neglected the seduction, and so Mother Earth has then yielded up evidence, not only objective, but compulsory, and we have been to re-date most of our red-figured vases. It was, perhaps, too late to alter the text, surely a footnote was possible in a matter of so much importance. The unwary reader might go to the end and never notice the flyleaf of corrections. If some of these vases would escape the eye of any but the specialist, there is one serious defect even from a popular point of view. There is no chapter on the shapes and uses of vases. Such a chapter is an elementary necessity. It is true there is much excellent information about development and modification of shapes at different periods, but it is scattered, and, therefore, liable to be overlooked, or, at least, only remembered with difficulty. A want of this kind of knowledge of shapes and uses, knowledge if systematically presented can be acquired in an hour, will seriously hamper the reader if he be a beginner.

A fault found, however, the book is not only good one, but by far the best we have, and we get a handbook of our own it should command a large English public. The time is coming when mythology will largely be read on, and taught from, vase-paintings, and every classical student will perforce wish to know something of the sources from which mythology is derived.

*Historical Records of St. Albans, containing the history of the Grammar School and Leprosy in St. Albans during the Middle Ages.* By THOMAS E. GIBBS. (Gibbs & Bamforth.)

ALBANS is an inexhaustible quarry for the archaeologist, and its Abbey is only one out of many objects around which historical traditions of more or less interest cling. The Grammar School dates back a long way. It did not owe its birth to the revival of learning in the fifteenth century or to the Reformation, but has had an almost unbroken existence from the latter part of the twelfth century, was probably founded at a still earlier date. It was dependent upon the Abbey, and in its circumstances we owe the preservation of many curious details of medieval school and government reproduced by Mr. Gibbs.

But St. Alban's Grammar School underwent a thorough process of re-modelling in the reign of Edward VI. and Elizabeth. Sir Nicholas Bacon, whose fame has been almost entirely eclipsed by that of his son, took the school under his fostering care and procured for it an endowment. One source of revenue was to be from monies paid for selling wines within the borough, a privilege limited to two or, at most, to three publicans. The custom still prevails, and in 1883 the licences fetched at public auction the sum of £86. The Grammar School was held for a long time in the Lady Chapel of the Abbey Church, which, as may be supposed, suffered no little damage at the hands of the boys, the beautiful fourteenth century work of Abbot Eversden having been terribly mutilated. Transferred to the Gate House, the only part of the monastic buildings not destroyed at the Dissolution, the scholars have less scope for mischief, and it may be hoped, less inclination. The school has produced some men of mark, notably Chief Justice Pemberton and the late Professor Donaldson, and has had in its time some eminent masters. In the first place must stand the anonymous printer, contemporary with Caxton, who is called "sometyme scole mayster of Saynt Albon"; then we have Alexander Nequam, a scholastic divine and poet; and lastly James Shirley, the dramatist, who died of grief at the great Fire of London. Space will not allow us to notice what Mr. Gibbs has to say about St. Julian's Hospital, but we must find room for a word of thanks to him for the good service he has done in making public these interesting results of wide and careful research.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

13,588, Extinguishing Fires in Mills, Theatres, &c. L. A. Walker.

According to this invention, a large number of perforated pipes are led from the main pipe, and are so placed that a spray of water can be directed over the walls, ceilings, and floors. The flow is controlled by separate valves placed easily within reach.

13,680, Roofs. J. Seaton.

In roofs constructed entirely of iron and slate, the object of this improvement is to afford a more secure and better fastening. It consists in a simple mode of attaching the two sets of angle-irons together. The inner leaf of each horizontal angle is cut or notched for a depth equal to the depth of the crossing-leaf of the other angle-iron. The outside leaves of the horizontal or purlin angle-irons thus rest directly on the outside leaves of the inclined or rafter angle-irons. The two sets are secured where they cross by a bolt and nut, the bolt passing through the outer leaves of each. The slates are attached to the purlin-irons by copper nails or pegs, which pass first over the inner or top leaves, and are then bent down and back under the same.

13,858, Production of Designs or Letters in Artificial Marble or such like Substances. J. B. Rottenstein and H. A. Cousins.

According to this patent, mosaics or designs are formed by placing in a glass or other suitable mould sufficient plastic material, such as cement, as will cover the letter or design it is desired to produce. While still soft a template of the design is placed thereon, and a knife or cutter passed around the template. When the material has partially set, the superfluous pieces are removed, leaving the letters or designs alone in the glass or mould. If they are to be shaded, the material is filled in around them, and afterwards cut in the same way, after which the ground is filled in and the slab finished.

4,518, Opening and Closing Fanlights. J. H. Marston.

The fanlight which is the subject of this patent is actuated by a worm-fixed and cogged-teeth gearing, which is moved by a cord pulley. The opening and closing is controlled by a ladder-bar which guides the casement.

9,733, Double Fan for Wash-out Closets. E. Emmanuel.

By this invention fans are so filled as to spray the water in delivery. By the simultaneous action of the combined fans the basin is thoroughly cleansed. Two fans—an upper and lower one—are used, and by the rapid discharge of the double fan the contents of the trap are forced out each time the closet is used.

9,856, Window Sashes and Sash Frames. B. Münster.

The sashes which are the subject of this patent are hinged on vertical rods or axles, with bearings in guide blocks sliding in grooves in the top and bottom sash frames; the rods have mounted on them, near the top and bottom, pintons which engage with racks secured to the sash frames along the said grooves.

#### NEW APPLICATIONS FOR PATENTS.

Aug. 31, 12,540, J. Mason, Skylights, Ventilators, &c.—12,541, J. Cook, Water Closet Apparatus.—12,571, T. Harris, Stoves.—12,582, R. Allen, Door Lock.

Sept. 1, 12,589, H. White, Window Fasteners, &c.—12,592, C. Hamilton, Attaching Incandescent Electric Lights to Gas Brackets or other Fittings.—12,610, W. Evans, Stiles or Gates.

Sept. 3, 12,659, H. Atkinson, Suspending Window Sashes, Doors, &c.—12,660, T. Secker, Door-Steader.—12,668, J. Taylor, Stench Trap.—12,685, A. Spaul and C. Callan, Burglar-proof Sash Fastening.—12,701, O. Imray, Preventing Window Sashes from Shaking.—12,705, E. Nunan, Metal Laths.—12,709, H. Lake, Door Hinges.

Sept. 4, 12,713, T. Sharples and H. Graham, Windows.—12,715, O. Wright, Charging Syphons for Flushing Water Closets.—12,722, J. Finnis, Automatic Door Bottom Guard.—12,729, G. Bickles, Metallic Roofing.—12,739, J. Hancock, Creating Up-draught in Chimneys, and Ventilating.—12,741, J. Tonge, Chimney-pot.—12,747, W. Phillips, Portable Wooden Houses, &c.—12,753, H. Lake, Circular and other Saws.—12,771, K. Robinson, Die for Brickmaking Machines.

Sept. 5.—12,830, J. McChesney and A. Cobham, Sash-balance.—12,841, A. Jack, Manufacture of Cement.—12,845, F. Alchin, Asphaltic Floors, &c.

Sept. 6.—12,878, J. Howie, Flushing Cisterns.—12,886, J. Gerhold, False Back for Fire-grates.—12,910, E. Thomson, Laying Wood Floors, &c.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

14,955, D. and W. Bostel, Syphon Flushing Cisterns.—9,358, J. Lind, Stoves.—10,876, W. Hardcastle, Attaching Lanes, Cords, or Chains to Window Sashes, &c.—10,940, J. Willing, Sign Letters for Facies, &c.—10,960, E. Newton, Surveying and Levelling Instruments.—10,990, C. Shawbrook's Roofing Tiles.—11,199, J. Ferguson, Finger-plates.—11,254, J. Hollenthoner and A. Wiesenbacher, Flooring for Bakers' Ovens.—11,632, P. Mooney, Syphon Apparatus for W.C.s.—11,603, C. Darrah, Ventilators.—11,813, A. Lupton, Centrifugal Fans for Ventilating.

#### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

14,851, J. Coulter, Stone-dressing Machinery.—14,906, D. and W. Bostel, Syphon-flushing Cisterns.—15,065, F. Ransome, Manufacture of Cement.—15,071, J. Wright, Chimney Top and Ventilator.—15,203, J. West, Water-waste Flushing Cisterns.—15,763, A. Haslam and J. Settle, Fire-places or Grates.—16,450, D. Knowles, Sash-fasteners.—11,275, R. G. and E. Restall, Stoves.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

###### SEPT. 5.

By FAREBROTHERS, ELLIS, CLARE, & Co.  
City of London—57, Wood-street; and 2, London Wall, freehold ..... £100,000  
By CHADWICK & SONS.  
Westminster—53, Tufnell-street, freehold ..... 820  
8, St. Ann's-lane, freehold ..... 225  
Pimlico—7, Charlwood-place, 39 years, ground-rent £8 ..... 610  
Westminster—10 to 16 even, Coburg-row, 12 years, ground-rent £4 ..... 660  
Battersea—127, Church-road, 62 years, ground-rent £3 12s ..... 170  
32, Ethelburga-street, 39 years, ground-rent £5, 7s. ..... 205  
By WYER, FARMER, & ADAMS.  
Kingsland—4, Nancy-street, 44 years, ground-rent 20 ..... 160  
Mile End 29 to 35 odd, Longnor-road, 76 years, ground-rent £14 ..... 720

###### SEPT. 6.

By T. B. WESTACOTT.  
Horton—62, Murray-street, 54 years, ground-rent £5, 6s. ..... 420  
By NEWBOLD & HARDING.  
Barnsbury—59, Hemmingsford-road, 64 years, ground-rent £8 ..... 405  
29 and 31, Blundell-street, 63 years, ground-rent £10 ..... 465  
35 and 37, Blundell-street, 63 years, ground-rent £10 ..... 480  
Canonbury—27, Canonbury-square, 30 years, ground-rent £7, 4s. ..... 400  
Ball's pond—30, Stanley-road, 63 years, ground-rent £4, 2s. ..... 305  
Clerkenwell—34, Margaret-street, 37 years, ground-rent £8 ..... 300  
Burton-crescent—46, Sandwich-street, 18 years, ground-rent £17, 17s. ..... 350  
Tavistock-square—2, Tavistock-square, 9 years, ground-rent £7, 7s. ..... 70  
Brunswick-square—16, 48, 54, and 56, Colonnade, 4 years, ground-rent £6, 6s. ..... 120  
18 and 19, Colonnade, 18 years, ground-rent £28, 6s. ..... 60

#### MEETINGS.

##### TUESDAY, SEPTEMBER 18.

Glasgow Architectural Association.—Mr. T. Gildard (Hon. President), on "Recollections and Reflections."

##### WEDNESDAY, SEPTEMBER 19.

Builders' Foremen and Clerks of Works' Institution.—8.30 p.m.



## Miscellaneous.

**A New Seaside Resort on the Kent Coast.**

A few days since an extensive sale of building land took place on the Littlestone-on-Sea Estate, a new watering-place near the ancient Cinque Port of New Romney, in Kent. The estate, which is upwards of 200 acres in extent, is now being laid out for building. The estate is situated on the margin of an extensive bay, Dover and Folkestone being on the left, and Dungeness Point on the right. Amongst the several new roads which have been formed on the estate, one now in course of construction is 100 ft. wide, and upwards of a mile in length, from which by roads lead to all parts of the estate. Gas is supplied by the New Romney Gas Company, and water has been laid on. An area of twenty acres is to form a new park, in which a pavilion is to be erected for the accommodation of visitors. The centre of the bay has been selected for the erection of a pier, and opposite to it a large hotel, to be called "The Grand," is in progress of construction. A complete scheme for the sewerage and drainage of the whole estate has been prepared by Mr. Eacchus, C.E., and the work has been commenced. Several houses have already been erected on what is designated the Marine Parade, and others, together with a number of shops, are now in progress. The sale last week was held at the Station Hotel, New Romney, Mr. Charles, of the firm of Messrs. Charles & Tabbs, of Basinghall-street, being the auctioneer. The number of freehold plots offered was 170. The plots had frontages varying from 15 ft. to 30 ft. The sale was very well attended, the company consisting principally of London builders and speculators, who were conveyed to the estate from the Cannon-street station of the South-Eastern Company by a special train. Before offering the property, the auctioneer, amongst other remarks, incidentally observed that the works at the pier, the plans for which had been prepared by Mr. Driver, engineer, would be commenced early next year. There was a keen competition for the several plots, especially for those possessing a sea-frontage. Nearly the whole of the lots offered were sold, the prices realised ranging from 110*l.* to 145*l.* each. The proceeds of the sale amounted to about 7,500*l.*

**Sale of Building Sites near Southend.**

About a mile-and-a-half to the westward of Southend a large area of land, upwards of twenty acres in extent, and known as the Sea View Estate, is at present being laid out for building purposes, several new roads intersecting the estate being now in course of formation, and on Monday last an extensive sale of the building sites on the estate took place in a marquee erected on the property. The estate is situated between Cliff Town, Southend, and Leigh, standing on the brow of a hill elevated about 120 feet above the level of the sea, sloping gradually to the south, overlooking Southend, and commanding extensive views of the sea, and also of the opposite Kent coast. It is approached from the Leigh Station on the west side along a steep hill. A special train conveyed a numerous party from Fenchurch-street to attend the sale, which was conducted by Mr. W. H. Iles, of East India-road. The plots submitted were 185 in number, having frontages varying from 17 ft. to 20 ft., and depths of from 90 ft. to 160 ft. The auctioneer, in introducing the property, pointed out that Southend was rapidly extending westward, and there could be no doubt that the time was not far distant when Southend and Leigh would be united. He drew attention to the fact of the roads on the estate having been so laid out that from nearly every plot views of the sea might be obtained. The Local Board had greatly improved the west of Southend, and were about to extend the Marine Parade westward to this estate, when there would be a fine marine drive and walk upwards of four miles in length. In answer to questions as to the drainage of the estate, he said that they were within the district, and under the control of the Southend Local Board, who had now under their consideration a very comprehensive scheme for the drainage and sewerage of the entire district, which would include the estate. There was a very active demand for the several lots, the whole of which were sold at from 10*l.* to 20*l.*, and 30*l.* each, a tavern-plot, having a frontage of 51 ft. and a return frontage of 97 ft., realising 72*l.* The entire proceeds of the sale amounted to about 2,600*l.*

**Sale of Building Sites at Frinton.** On Monday last a further sale of building sites—the second during the present season—took place at Frinton, the new watering-place on the east coast, situated between Clacton and Walton-on-the-Naze. The plots offered were 75 in number, comprising sites on the East Cliff facing the sea, the Fourth Avenue, adjoining the West Cliff, the Crescent, Raglan-road, Old-road, and Harleston-road. Messrs. Hartman Bros. conducted the sale, which took place at the Queen's Hotel, where there was a large number of buyers present. The auctioneer adverted to the great progress which Frinton was at present making, as indicated by the increasing demand for sites and the building now in progress. He pointed out that in the course of three or four weeks all the houses would be supplied with a constant water-supply, the Tending Hundred Water Company having nearly completed the laying-down of mains, whilst gas was supplied by the Walton-on-the-Naze Gas Company. He added that a park was about to be laid out at the west end of the estate, ten acres of land close to the sea having been reserved for that purpose. Several of the plots offered had frontages of from 50 ft. to 60 ft. each, and none less than 25 ft., whilst the depths were from 120 ft. to 200 ft. Nearly the whole of the plots offered were sold at prices ranging from 2*l.* to 3*l.* per foot frontage. The sale realised 3,450*l.*, which, with 2,500*l.*, the proceeds of the sale in July last, brings up the total sum realised for the sites sold this year to close upon 6,000*l.*

**The English Iron Trade.** Owing to the well sustained demand, which for some products is increasing in volume, the English iron market continues very strong, and further advances in prices are reported this week. There is a good tone in pig-iron, the rising tendency of last week being maintained. There are slight increases in the value of Scotch pig-iron; Middlesbrough pig is quoted by makers is a ton higher, and a similar advance has taken place in Lancashire. Hematites are practically unchanged, although the quotation is from 45*s.* 6*d.* to 46*s.* for mixed numbers of West-coast brands. The market for old material is firmer, with an upward tendency. There is an increasing volume of business in finished iron. Small bars are 5*s.* a ton dearer, and other manufactured iron is very firm. Galvanised iron is still rising. Business in tinplates is brisk at the advanced rates. The steel market is as active as ever, and particularly strong. The call for ship-plates is described as unprecedented, and in consequence the manufacturers have again put up their prices, plates being now 7*l.* and angles 6*l.* 5*s.* Shipbuilding is carried on with great activity, and as orders and inquiries are satisfactory, and freights are rising, better prices for new tonnage may be expected. Engineers are now full of work.—*Iron.*

**Danish Railways in 1887.**—The reports of the Danish railways having just been issued for the current year, 1886-1887, it appears that there were then 973 miles of state railways and 248 miles of private railways in Denmark, no new lines having been opened during the year. The number of passengers conveyed was 7,674,000 on the former and 1,238,000 on the latter, being an average per mile of 7,800 and 5,000 respectively. On the state lines, for which alone returns are furnished on this point, 0.67 per cent. travelled first-class, 12.08 per cent. second, and 87.25 per cent. third. The total receipts on the state lines amounted to 736,000*l.*, against 711,000*l.* in 1885, leaving a profit of 108,000*l.* The value of the lines was estimated at about 1,620,000*l.* The number of men employed was 5,700. Only three passengers were injured, and these but slightly. The number of private railways was eleven, three of which show a deficit in working, and the remaining eight a profit of 80,000*l.* Thus, on the state lines the profit was 111*l.* per mile, against 323*l.* on the private ones.

**New Apparatus for Drying Buildings.** A Russian engineer, M. De Wrozninsky, has, according to the *Novoye Vremya*, invented an apparatus for drying buildings which is said to have proved very effective. It is based on the principle of carbonic gas rapidly absorbing the moisture of the air, and to this end the inventor has constructed a closed stove burning charcoal by the introduction of air into it direct from the open through two tubes. A steady current of dry warm carbonic gas is allowed to escape into the room to be dried, which rapidly absorbs the moisture in the air, and escapes in the ordinary manner through the chimney. The apparatus has been patented.

**Value of City Property.**—The high price which property in the City commands was shown at a sale which took place at the Auction Mart last week, when Messrs. Farbrother, Ellis, Clark, & Co. offered for sale, by order of executors, the freehold land and buildings at the corner of Wood-street and London-wall. The property was described as occupying one of the most prominent corner positions in the City, possessing a total frontage of 166 ft. It was stated that the premises were rebuilt and completed in 1884, after the great fire in Wood-street, by the well-known builders, Messrs. Bras & Co., from the designs of Messrs. Ford and Heskech, and that they contained altogether eight floors. They are let to Messrs. Silb & Fleming for a lease of twenty-one years from January, 1889, at a rental of 5,000*l.* per annum. Sir J. W. Ellis, who conducted the sale, described the property as amongst the most valuable in the City, whilst his own personal knowledge enabled him to say that the buildings had been erected in the most substantial manner, the elevation being unusually attractive, and presenting a fine example of architectural skill. He estimated the value of the site and buildings at something like 170,000*l.* The biddings commenced by an offer of 60,000*l.*, and by advances of 5,000*l.* each 100,000*l.* was reached at which the property was sold.

**The Railways of Finland.**—From the reports just issued of the railways of Finland ending December 31, 1886, it appears that in that year the Uleåborg railway, 210 miles in length, was opened, making the total length of the State railways 958 miles. The latter line will directly connect the railway systems of Russia and Finland with those of Sweden and Norway, surveys for its construction towards the frontier being actually proceeded with. The gross returns in 1886 were 330,000*l.*, of which 135,000*l.* resulted from the passenger, and 195,000*l.* from the goods, traffic. The returns of 1885 were 150,000*l.* higher. The average receipt per mile was 340*l.* The expenditure was 210,000*l.*, the profits being thus 120,000*l.*, or 2½ per cent. interest on the capital. However, on one line there was a loss of 1½ per cent. The value of the State lines,—five in number,—was about 4,000,000*l.* There is only one private railway in the country, 20 miles in length. Under construction is the so-called Knapio railway, about 200 miles in length, which will connect the central part of Finland with the capital and the south coast, and which it is expected will be finished early next year.

**Ventilation of the Guildhall, York.**—Messrs. Robert Boyle & Sons's system of ventilation has been applied to the Council Chamber at the Guildhall, York, an ancient structure, the ventilation of which was very defective, though a number of air inlets and open extraction-shafts were provided, but which had generally to be kept closed owing to the draught proceeding from them, thus rendering the ventilation practically nil. We are told that this has been obviated since the application of Messrs. Boyle's system, consisting, in this instance, of two of their latest improved self-acting "Air Pump" ventilators, 30 in. diameter, fixed upon the roof, and connected by means of 15-in. diameter shafts, with two hoppers placed over perforated panels in the ceiling. This provides for the extraction of the vitiated air, the supply of fresh air being admitted through seven of Messrs. Boyle's improved air inlet tubes, 5 ft. 9 in. x 10 in. x 4½ in., fixed against the walls in different parts of the chamber. Mr. E. G. Mawbey, the City Surveyor of York, writes:—"The ventilation of this Council Chamber, which I have carried out on your system, is very satisfactory, notwithstanding that the room is altogether too small for the number of persons occupying it during Council meetings."

**New English Church in Norway.**—A movement is on foot in this country and in Norway for the building of an English church at Bergen, on the west coast of Norway, for the benefit of English visitors, there being now only one such edifice in that country, viz., in Christianity. The cost is estimated at about 1,000*l.*, and the money is proposed to be raised by a shilling contribution from English tourists.

**Archæological Discovery in Russia.**—An Odessa journal states that an archæological commission making excavations in the Volga district has discovered the remains of an old town on the right bank of the Volga, which bespeak a high class of civilisation. A large quantity of Arabian, Persian, and Tartar coins were found, together with a number of objects bearing upon the life and culture of the inhabitants.



|                                |       |   |   |
|--------------------------------|-------|---|---|
| Green & De .....               | 1,337 | 0 | 0 |
| Ward & Lamble (accepted) ..... | 1,375 | 0 | 0 |

LONDON.—For a shop-front and fittings to new premises, Upper-street, Islington, for Mr. J. Chambers. Mr. Eugene C. Beaumont, architect :—  
Williams ..... £548 0 0  
Lascelles & Co. .... 540 0 0  
Drew & Cadman ..... 483 0 0  
Mollett (accepted) ..... 405 0 0

LONDON.—For repairs, painting, &c., at 30, Fitzroy-square, W., for Mr. H. J. Bradley. Mr. John H. Martin, 83, Albany-road, S.E., surveyor :—  
Bywaters ..... £297 0 0  
Dixon, Highgate ..... 217 0 0  
Gould & Brand, Camden Town ..... 187 10 0  
Wallden, Walworth (accepted) ..... 145 0 0

LONDON.—For repairs and decorations at the "Prince Albert," Provost-street, Hoxton, for the Berkshire Brewery Company. Mr. Herbert E. Saunders, architect, 18, Walbrook, E.C. :—  
F. W. Milman, \* New Cross-road ..... £144 0 0  
[No competition.]

MILE END.—For repairs to clocks, Sidney-street. Messrs. Searle, Halton, & Bowyer, surveyors, Tottenham :—  
Smithers ..... £104 8 0  
Porter ..... 85 0 0  
Monk ..... 92 0 0

NEW BARNET.—For additions and alterations at "Lymdown Hall," for the Committee, Mr. Joseph White, surveyor, High-street, Barnet :—  
Smith, Tottenham ..... £248 8 6  
Ellwood, New Barnet ..... 210 0 0  
Voller, Wood Green ..... 195 0 0

PORTO ALEGRE (Brazil).—For machinery and plant for Brazilian Extract of Meat and Hide Factory, Limited, Porto Alegre, Brazil, from the designs of Mr. Frederick Colyer, engineer, 35, Great George-street, Westminster, S.W. :—

No. 1 Contract, "Extract of Meat Plant."  
Fawcett, Preston, & Co. .... £1,970 0 0  
Pontifex & Wood ..... 1,544 0 0  
No. 2 Contract, "Patent Water-Tube Boilers."  
Patent Steam Boiler Co. .... £2,879 0 0  
Babcock Wilcox & Co. .... 2,000 0 0  
No. 3 Contract, "Pumping Machinery."  
Simpson & Co. .... £287 0 0  
G. Waller & Co. (error in estimate) ..... 896 0 0  
Moreland & Son ..... 695 0 0  
Fawcett, Preston & Co. .... 690 0 0  
No. 4 Contract, "Charcoal Plant."  
G. Waller & Co. .... £498 0 0  
No. 5 Contract, "Lancashire Boilers."  
Fawcett, Preston & Co. .... £2,290 0 0  
Horton & Son ..... 2,040 0 0  
Thornewill & Warham ..... 1,970 0 0

ROTHERHITHE.—For repairing, painting, lime-whiting, &c., to the interior, and repairing and painting the exterior, of the Infirmary, Rotherhithe, for the Guardians of the St. Olave's Union. Messrs. Newman & Newman, architects, 31, Topley-street, London Bridge :—

Balaam Bros. .... £1,200 0 0  
Bellchamber & Son ..... 945 0 0  
A. Mackie ..... 896 0 0  
G. Parker ..... 890 0 0  
J. & J. Greenwood ..... 874 0 0  
W. Furniss ..... 798 0 0  
J. Bullers ..... 798 0 0  
Bargman & Son ..... 733 0 0  
W. G. Lilly ..... 688 0 0  
Vigor & Co. .... 633 0 0  
Twichin & Ansell ..... 631 0 0  
A. Martin (accepted) ..... 300 0 0

ROTHERHITHE.—For repairing, painting, and lime-whiting the interior, and repairing and painting the exterior, of the Casual Wards, Rotherhithe, for the Guardians of the St. Olave's Union. Messrs. Newman & Newman, architects, 31, Topley-street, London Bridge :—

Balaam Bros. .... £155 0 0  
G. Parker ..... 118 0 0  
A. Mackie ..... 103 0 0  
J. & J. Greenwood ..... 98 0 0  
Vigor & Co. .... 95 10 0  
Bargman & Son ..... 95 0 0  
W. G. Lilly ..... 93 0 0  
J. Bullers ..... 90 0 0  
Bellchamber & Son ..... 89 10 0  
A. Martin (accepted) ..... 42 10 0

Alterations, Cheyne-walk, Chelsea. Mr. F. Blandford, of 21, Avenell-road, Highbury, writes to say that his tender for this job (see list on p. 186 of our last issue) was 7561, and not 5561. We printed the list as it was sent to us by Mr. Cole.

#### TO CORRESPONDENTS.

G. F. H. (shall appear)—W. F. R.—W. H. C. (amounts should be sent)—R. A. L. (ditto)—F. B. (list not received)—E. S. (too late).  
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# The Builder.

Vol. LV. No. 2381.

SATURDAY, SEPTEMBER 22, 1893.

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## Restoration and "Ruinatio."



THE question of church restoration seems in a fair way to take the place formerly occupied by the sea-serpent and the gigantic gooseberry. It is becoming one of the favourite amusements of newspapers in the dull season. We commented the other day on the absurd excitement got up by some crack-brained enthusiasts in regard to the repair of Costessy Church; and the solemn and orthodox comments of the *Times* on a subject to which it could never have devoted a word had Parliament been sitting. But, behold! it is the off-season, and the floodgates of archaeological ilk have been unloosed, and the misdeeds at Costessy have given rise to a whole cross-fire of indignant and virtuous letters; the encyclical of the Society of Antiquaries has been printed in the *Times*; and the Institute of Architects has almost simultaneously issued a paper of cautions and good advice in regard to "the conservation of ancient monuments and remains;" and the privileged swash-buckler of the *Times* caps the whole with a general abuse of everybody, coupled with the usual advertisement of himself and his own dealings with the ill-fated cathedral of St. Alban's.

The documents issued respectively by the Society of Architects and the Institute of Architects have this unquestionable and (in these days) rather rare merit, that they are obviously issued in perfect good faith and with an eye to the public good in matters of art and architecture, and not to the glorification or the advertising of any individual; and that they are expressed with entire moderation of spirit and language; in this respect contrasting remarkably with the sensational and claptrap appeals of persons of the stamp of Dr. Jessopp and his allies. Of these latter and their views it is not necessary to speak at length here; and it must be certainly useless to reason with persons who have apparently lost all control of themselves, and who speak of altering the windows or roof of a decayed church as if it were a crime comparable with burglary or murder. We will only refer to the remark made by one of them, a certain "J. H. M.," who writes to the *Times* in sup-

port of Dr. Jessopp's nonsense, suggesting the establishment of a body in each county to form a tribunal to whom every scheme for restoration should be submitted, and adding,—

"Whatever authority may be constituted, however, one thing is certain, and that is that the persons composing it must not be such as would be subject to the dominating influence of professional architects. They must be able to hold their own against the gentlemen under whose guidance, hitherto, so much mischief has been done."

This is the manner in which it is now the fashion for people to speak who owe all their knowledge of Mediæval architecture to the study and elucidation of the subject by architects. It is no exaggeration to say that Sir Gilbert Scott, single-handed, did more to illustrate the history of our cathedrals and churches than all the members of the "Anti-Scrape" Society among them, while the Institute of Architects has just put forth a document in regard to the restoration of ancient buildings, the only fault of which lies in its over-conservative character and the too great emphasis which is laid on the historical in contradistinction to the architectural value of a building.

In this respect the circulars of the Institute of Architects and the Society of Antiquaries run upon pretty nearly the same lines. Both emphasise the importance of the historical character of an ancient building, and the desirability of doing nothing to interfere with or falsify that. In regard to the Society of Antiquaries this view is perfectly natural, and what the Society is almost pledged to by its very name and profession. Antiquaries deal professedly with past history, not with present requirements, and frame their requisitions accordingly. Architects might be expected to look more to the architectural design and the practical uses of the building; and we suspect that this would be more the case than it is, in the Institute encyclical, if this document really represented the general opinion of the majority in the Institute. We are given to understand, however, that it practically represents rather the judgment of two eminent church architects, though formally and officially adopted by the Institute.

Considering this, the document affords curious evidence of the manner in which what may be called orthodox architectural feeling and principle has shifted round the compass since the Mediæval revival commenced. In the former days of that revival anything like respect for relics of the past on the ground

of purely historical interest would have been scouted as a weakness; the main question was, were they or were they not purely Mediæval in character and date? If not, they were sinful excrescences, to be swept away without mercy, because they interfered with the Mediæval ensemble. This was no doubt a species of bigotry, which has been succeeded by a reaction of bigotry in the opposite direction. Now, whatever exists is to be protected, because it exists; without reference either to its harmony with the main style of the building, or its practical usefulness as a modern addition.

This historical view of architectural monuments is one of entirely modern origin. It never seems to have existed before the present century, and it is only in very late years that it has assumed its present importance. It does not follow from this, however, that it is a mistake or an absurdity. On the contrary, it may be considered to have been a defect in the perceptions of past generations, that they never recognised the historical interest and value of architecture as a record of the character and tastes of times past. Now that people have at last recognised it, they seem disposed to clutch at it and to cling to every remnant of old work as a precious possession which, once gone, can never be restored. It certainly never can; but something worth as much might be put in its place, if only we did ourselves justice and believed that things done in the present day, if done with all our heart, might be worth something to posterity, and become history in their turn.

It is the want of any hope or confidence of this kind that strikes one so much in the aforesaid encyclical of the Institute. A respect for the historical value of architectural monuments is one thing, a blind worship of everything old is another thing. One can hardly call it less than this, when we read that "the external halves of mullions, sills, and jambs should, where possible, have such parts as are decayed restored by dowsing new stone on to the old internal halves." What a way to treat stonework, and what a piece of fetish-worship of old fragments! Again, when the ends alone of beams and rafters of old roofs are decayed through leakages from gutters, "the old roof should not for this reason be discarded, but new ends should be scarfed on." The preservation of an old roof, unless it were a most unique and fine example, would surely not justify such a piece of unconstructural patchwork as this. Upon what principle, again, are absolutely modern



additions to be removable, while additions made a hundred years ago are to be held sacred? The theory implied, both in the Institute and in the Society of Antiquaries' circular, is that the changes in style in the furniture and fittings of a church are part of its "history," valuable records of the changes of taste at various periods. But why, in that case, are not the recent or "modern" fittings and alterations equally part of the history? They are not history to us, but they will be to our grandchildren. But the Institute circular evidently contemplates the removal of these:—"Any clearance of wall-linings, pavements, flooring, galleries, high pews, modern wall partitions, or other encumbrances (*provided they be clearly modern*), necessary before detailed arrangements are made for the restoration, should only be carried out under the direction of the architect," &c. We have not the slightest objection in most cases to the removal of high pews, galleries, &c.; they are mostly ugly excrescences, and at variance with the style of the church; but on what principle does the Institute recommend or allow their removal, any more than any other portions of "history"? Or will the authors of the "General Advice" define to us at what precise date things cease to be "modern" and become "history"? They will find it rather difficult to do so logically.

Why, again, does the Institute speak of "restoration" at all, if the object is to preserve everything as it is in its present state? That is certainly not "restoration" if the word has any meaning at all. "Restoration" implies bringing a building back to its original state, and sweeping away excrescences. This is obviously what the Institute does not recommend except in cases of completely modern additions; and it is illogical in recommending it in that case, since they are part of "history" as much as any other additions.

The "historical view" in its entirety, therefore, seems to us a wholly untenable one, the undue emphasis at present laid upon it being a natural and perhaps necessary reaction against the views of the earlier restoration period, which were for reproducing everything Gothic and sweeping away everything post-Gothic. The case as against this principle is put by the Society of Antiquaries as follows:—

"The Society cannot too strongly insist on the great historical value of our ancient parish churches, every one of which contains in its fabric the epitome of the history of the parish, frequently extending over many centuries. What would appear to the Society to be the duty of the guardians of these national monuments is not to 'restore' them, but to preserve them,—not to pretend to put a church back into the state in which it may be supposed to have been at any given epoch, but to preserve, as far as practicable, the record of what has been its state during all the period of its history."

The Society does not overlook the necessity of adapting the buildings to the wants of the present day, but it contends that the greatest part of the mischief that has been done to our churches has not added to the convenience of the buildings, which is in no way aided by destroying the more recent portions of a church and rebuilding them in a style which imitates the older portions, nor by the destruction of furniture and monuments only because they are not of the date which is assumed to be that of the church. New work done to suit new wants, and not pretending to be other than it is, will carry on the history of the building in the same manner as did the old, and the Society has no wish to prevent that from being done. It only urges that the ancient record should not be wiped out to make room for the new, nor falsified by making the new a servile imitation of the old. Uniformity of style was very rarely a characteristic of our old churches, and a part of the building or a piece of furniture in it is to be judged, not by its conformity to this or that style, but by its fitness for its place and for the work it has to do."

This is moderately and fairly put, and without the hysterical ranting which accompanies all the protests of the Society for the Protection of Ancient Buildings. As to the great historical value of our parish churches, we quite agree with the Society of Antiquaries. But the Society entirely overlooks the question of architectural design, and practically overlooks that of convenience. They say that they "do not overlook the necessity," &c., but they immediately go on to assert

that the greatest part of the "mischief" (anglicised "restoration") done to our churches "has not added to the convenience of the buildings." Has it not? Nor, perhaps, to their order, decorum, and decency for divine service? Are we to take the Society of Antiquaries to be seriously asserting that the parish church blocked up with galleries in a decayed and corrupt Renaissance style, put in with no regard to the lines of the architecture, and the floor covered with square boxes, like the divisions of a cattle-market, was in as good and fitting and presentable a state for the celebration of public worship, and represented as agreeable a spectacle architecturally, as the church cleared out and restored to order and architectural consistency by a competent hand? If they mean that, they are asserting an absurd paradox, and showing as much bigotry in one direction as the mediævalising restorer shows in another direction. The argument, again, that "uniformity of style was very rarely a characteristic of our old churches," is one that must not be pushed too far. There is, at all events, far more analogy of style and feeling between one period of Mediæval architecture and another, than there is between any period of Mediæval architecture and Renaissance work. However good the latter may be, it makes an architectural discord; and if it is not very good, it is better away, history notwithstanding. The fact that the Mediæval architects made additions to a church in the style of their own day, without regard to the style of the existing portions, does not prove that they exercised the highest architectural judgment in doing so. Their naive indifference to any style but that of the moment, their manner of patching a piece of their fourteenth-century Gothic on to a Norman or Transitional building, without the least regard to consistency of style or detail, is a very curious and significant fact in architectural history, but it does not prove that consistency in architectural design and detail is of no importance. It only appears as if the Mediæval architects were indifferent about it. Possibly they were wrong. Perhaps their architecture would have had even higher intellectual interest if they had exhibited a distinct effort to assimilate the new work architecturally to the old, preserving a certain distinction of character. Or, possibly (which does not seem to have occurred to any of the disputants in the matter) the Mediæval architects never contemplated or intended leaving a cathedral in a patchwork state in regard to style. They added or rebuilt as much as they could afford to build in the style of their own day. Each generation of them, had it possessed the time and the means, would probably have pulled down a whole cathedral to rebuild it in their own taste, regardless of "history."

It is, however, the rôle of a society of antiquaries to emphasize the historical aspect of the question. But it is not the rôle of a society of architects to do so. The encyclical of the Institute is merely the antiquarian view over again. From this point of view, the advice given is no doubt good, and is from the experience of those who have had long acquaintance with ancient churches. If the object is to save every scrap of old work that can be saved, no advice could be better or more to the point than what is given in their code of suggestions. But some of it is advice such as never was given by "architects," in the true sense of the word, in any generation before this learned and critical one. The idea that an architect may be called upon to improve an old building never seems to enter the heads of the advisers. If the floors are out of level, this fault of level is to be carefully preserved. Where it is absolutely necessary to construct a new roof, "either the old roof, where it exists, should be carefully reproduced, or the new roof should be

made of the same pitch as the original roof," &c. Why "carefully reproduce" the old roof? Why not try to make a better one? That is what a Mediæval architect would have done. Then, "in all church restorations one main object should be to get rid of modern additions, put up without regard to architectural propriety." Precisely: and what are Jacobean additions? Gothic churches but "modern additions put up without regard to architectural propriety." They are not "modern" now, but they were when they were done. Why are they to have the halo of sanctity merely because they have been there so many years? Consistency of architectural design and feeling is a matter of importance, and ought to be so regarded by architectural designers; the Renaissance and Georgian adapters of our churches absolutely ignored it, and the modern Institute of Architects, instead of cursing them, blesses them altogether.

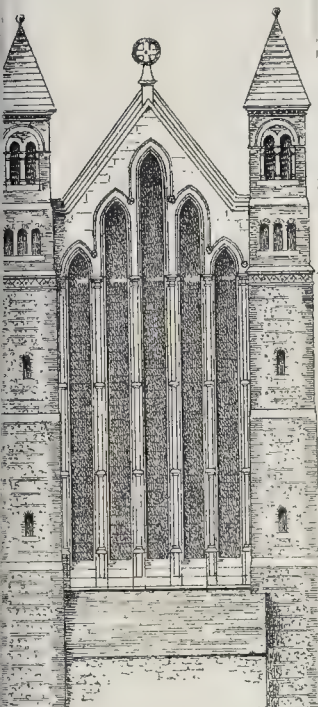
It is the more to be regretted that the Institute should thus have emphasized the merely antiquarian view of architecture, and failed to take up the true architect's position in the matter, because they thus assist in giving a kind of point, which it would not otherwise have, to such a rampant assault upon everybody and everything architectural and archæological as Lord Grimthorpe's latest in the *Times*. Of all the absurdities of the recent letter-writing about restoration, perhaps the greatest is the appearance of Lord Grimthorpe as the champion of true restoration, considering the enormities of which he himself is guilty, and of which the *Times*, which can wax eloquent over such a little matter as Costessy church, seems to be, or chooses to be, entirely ignorant. On paper, however, there is a good deal in which Lord Grimthorpe is quite correct. His manner of writing, indeed, is so increasingly insolent and offensive that we wonder the *Times*, for its own credit as a journal, admits such letters; and it is natural that a cultured and courteous gentleman like the President of the Society of Antiquaries should feel that he is entitled to decline to take any notice of a critic who writes with such an entire and ostentatious disregard of all courtesy or good manners. But Lord Grimthorpe has a great deal of reason on his side, in spite of his ill manners, when he calls the policy of mere letting alone and patching-up of ancient buildings a policy of "ruination," and both the Institute and the Society of Antiquaries would have a better case if they recognised that architecture, as a living art, is something, and that archæology and history are not everything. We have always recognised that, and Lord Grimthorpe has been so much put out by the perverse reasonableness of our views on the matter, that he has found it necessary more than once to misrepresent us in the *Times* as being allied with the do-nothing and "anti-scrape" party; in respect of which he is in this predicament, that if he reads his *Builder* he knew that what he said of it was false, and if he does not he was in the equally dishonest position of making positive statements about a journal of which he knew nothing, to serve his own purposes. That, however, will not matter to Lord Grimthorpe; nor does it matter much to us. There is one portion of his recent letter, however, which it is worth while to comment on. Lord Grimthorpe is now flourishing Ferguson in the face of the *Times* readers, as a supporter and admirer of his work at St. Albans. Concerning this it may be remarked that, although Ferguson was a remarkably diligent and comprehensive student of architectural history, and has left a unique book thereupon, which is of permanent value, he has never been recognised as an infallible, or even as a very trustworthy, critic; that his chief sympathy and his best comprehension were for Classic architecture—he never really understood or sympathised with Gothic; and that he was, as he himself told us, "as blind as a bat" (those were his own words), and could not recognise a man he knew at the distance of a yard; and, consequently, if he was carried off to look at and give his *imprimatur* to the front of St. Albans, it is impossible

\* Where, as in some exceptional cases, there has been a decided and intentional slope in the floor for the purpose of some fancy of architectural effect, of course this should be preserved unless exceedingly inconvenient to the modern congregation; but the reference in the circular appears to be to varieties of level arising out of mere carelessness and bad building.

\* The italics are ours.



at he could have really seen the details, which are the head and front of the offending case. What is more to the point than is, perhaps, that we have seen no evidence



Sketch elevation of new facade to south transept, St. Albans; showing the lancet lights carried above the ceiling-line, and the sham heads towards the interior.

of Fergusson's approbation except from Lord Grimthorpe's own statement in a letter in the *Times*; and as Lord Grimthorpe has more than once put in print imaginary quotations from our columns, invented by himself, we should not be surprised to find that his citation of Fergusson's words was equally imaginative and ideal, if the truth were known.

However, the more recent Grimthorpean architecture at St. Albans, at all events, was executed since Fergusson's death, and therefore cannot have been included in the blessings supposed to be uttered by that architectural prophet. And the transept work is ten times worse than the west front. The former we characterised as being essentially what might be called "Dissenting Gothic"; it is very bad, clumsy Gothic, but it would have passed muster fairly as a design for the façade of a great Dissenting chapel—taken as a whole, at least; some of the details are furiously bad, even from that point of view. The Clerk of Works who assisted in the west front, and who had picked up a kind of smattering of Gothic under Scott, is dead since then, and the new "ghost" seems to be inferior to the old one. What term to apply to the new south transept front we hardly know; "railway-station Gothic" would perhaps be the most appropriate. At all events, as Lord Grimthorpe applies the term "ruination," not unhappily, to the procedure of the party of ultra-conservatism in the treatment of ancient buildings, and as he poses as the champion of the architectural treatment of buildings, we have thought the best comment on his letter in the *Times* would be to publish an illustration of his last piece of work at St. Albans (see plate in this week's number), and ask any readers who know anything of architectural art, professional or amateur, what they think of that as

a specimen of design to be stuck on to an ancient cathedral, and whether there is not more than one kind of restoration which may fairly be called "ruination"? The illustration is reproduced from a photograph, so there can be no pretence that it is not a fair representation. As far as its style and beauty of design are concerned, we leave it to speak for itself; comment would spoil it. But this is a remarkable design in other ways than style; there is more in it than appears on the surface. The reader will observe in the plate the bold and even sublime soaring up of the lancet windows into the gable. But what will he say when he is told that



Window as seen from interior.

these windows cross the line of the internal ceiling, and that sham window-heads are ordained within, as shown in the rough interior and exterior elevation subjoined, to range under the ceiling-line! If any student perpetrated such an absurdity in a design sent in for our Academy or Institute architectural prizes, he would be the butt and laughing-stock of his fellow students.\* But this is the way in which a great English cathedral is allowed to be botched up by an architectural pretender who can pay for the privilege of amusing himself in this manner with a building which is the property of the nation; and it is the author of this kind of architecture who is allowed to lecture by the column on architecture to the English public in the pages of its leading journal.

#### TESTING MATERIALS.†

**T**HE behaviour of building-materials such as stone, brick, timber, and iron when actually combined in a structure, and subject to the compressive and tensile strains which such a combination involves, must always be, to a certain extent, a matter of conjecture, as it is impossible to apply accurate tests to the materials in such a position. Up to a quite recent date it was assumed that the behaviour of such materials could be deduced from the phenomena observed with small specimens when tested in a laboratory under conditions as nearly as possible like those occurring in actual practice. For instance, if the average crushing strength, as ascertained by experiment upon a number of one-inch cubes of a certain kind of stone, were two tons to the square inch, the assumption was that we might take this as a constant, and deduce from it the crushing strength of a block of similar stone of nine square inches area. It was soon seen, however, that even with the small specimens there were considerable and inexplicable variations of strength, and it was rightly felt that the possible number of unknown disturbing elements would be largely increased as the size of the specimens became greater, and hence a very large margin of safety, in many cases as high as one-tenth the breaking weight, was prescribed. This "margin of safety" is, however, more or less a matter of

\* The true way to treat the windows in such a case is that shown at York Minster, where the "Five Sisters" form the windows of the church itself, and the roof is lighted by a smaller series of lights, which fill up the gable-head. Lord Grimthorpe seems to have been improving on York Minster.

† Notes on the Compressive Resistance of Freestone, Brick Piers, Hydraulic Cements, Mortars and Concretes, by Q. A. Gillmore, Ph.D., of the United States Army. New York: John Wiley & Sons. London: Trübner.

guesswork, and it has been recognised of late years that the breaking strength of any material is not a sufficient criterion of its usefulness. The cases where any material actually used in a building is regularly and continuously loaded up to a certain point and the load then maintained at that point are so excessively rare as to be almost non-existent. In practice the loads are constantly changing, and the probability is that this variation of load has more effect than anything else upon the ultimate strength of the material. Thus Wöhler, in the exhaustive series of experiments which he made for the Government of Prussia, proved conclusively that an iron bar which would bear a steady load of 40 tons for an indefinite period without breaking would last but a very little while if alternately loaded with 40 tons and 10 tons. It has, therefore, been the aim of experimenters during the last few years to apply tests of varying character upon pieces of large dimensions, and these form the only trustworthy data upon which to base calculations. Germany and the United States have taken an honourable lead in these investigations, and we have already called attention to the experiments on timber made at the Massachusetts Institute of Technology by Professor Gaetano Laiza.\* Professor Bauschinger, in Munich, and Dr. Böhm, in Berlin, have also carried on a series of the most elaborate and minute experiments with a view to ascertain the effect not only of purely static loads but also of repetitions of strain and other variations. Unfortunately, the results of the tests made by these and other experimenters lie hidden in the scattered pages of numerous scientific journals, and Professor Unwin has conferred a great benefit upon English readers by publishing a considerable number of the results in his recent work on "The Testing of Materials." The difficulty of making these experiments lies in the fact that, with such materials as iron, stone, and cement, a testing-machine of very great power is required, and it must also register very accurately or it would be useless. It is needless to observe that such a machine is a very costly apparatus. One of the best testing-machines in this country is that at the City and Guilds Technical Institution at South Kensington, but it is nothing like as powerful as is required for an exhaustive series of tests, and is not to be compared with the machine at the Watertown Arsenal, near Boston, which was erected by Mr. A. H. Emery under an Act of Congress passed in 1875. This is described by Professor Unwin as probably the most perfect and reliable instrument in the world, as, although capable of exerting and registering a pressure of 450 tons, it is delicate enough to register the force required to snap a horse-hair. The results obtained from such a machine are so valuable that it would be well worth the while of any Government to follow the example set by that of the United States, and have one constructed. A series of experiments had been made under the order of the Government of the United States previous to 1875, by Colonel Gillmore, upon specimens of stone and brick with the best instrument that then existed, a 50-ton machine, but after the construction of the new and more powerful machine, it was resolved to extend these tests, and the results are published in the work now before us. The following materials were tested. (1) A kind of sandstone known as Haverstraw freestone in the shape of cubes varying from one to twelve inches on the side by regular increments of an inch; also the same material in the shape of prisms 4 in. by 4 in. area, and 1, 2, and 3 inches thick respectively, and 8 in. by 8 in. area and similar thicknesses. (2) Cubes and prisms of neat cement. (3) Cubes of mortar and of concrete mixed with cement in varying proportions. (4) Short brick piers built in cement. Great care was taken that the surfaces of the specimens in contact with the plates of the machines were as smooth as possible, and, to ensure this, a very thin coating of plaster of Paris was given them.

\* See the *Builder*, vol. 49, p. 632.



We believe this is the plan now generally adopted for securing evenness of bearing, and it is very interesting and instructive to notice in this connection the extraordinary results obtained when thin sheets of lead were placed between the surfaces of the material and the pressing-plates of the machine. In every case the specimens were crushed with a pressure far below that which was generally required to break them, and instead of showing the ordinary phenomena of breakage, viz., the two pyramidal fragments, they seemed completely to disintegrate and suddenly to go all to pieces. Professor Unwin's experiments entirely confirm these results. It appears that the lead not only penetrates into the minute interstices of the stone and thus acts as a wedge, but that at a certain pressure it begins to flow and then exerts a very powerful strain at right angles to that produced by the machine. This shows how wrong it must be to bed iron girders on lead sheets, or to place this metal between the stones of a column, as used to be the practice.

It would be impossible to allude in detail to the large number of tests recorded in the work in question, and we can only refer to the leading facts brought out. With reference to the stone cubes, it was invariably found that if the surfaces in contact with the plates of the machine were plastered, the blocks resisted a greater weight than when rubbed only, however finely this was done; thus giving an additional proof, if one were needed, of the great importance of accurately dressing the beds of stone used in buildings. The comparative resistance of various sized cubes, as shown in the experiments, is interesting, but we cannot think it safe to base any rigid conclusion upon the results, because the number of specimens tested was too small. For instance, the crushing strength of 1-in. cubes was greater per square inch of area than that of all other sizes operated upon, except the 5-in. and 6-in.; but we feel convinced that this must have been due to the fact of these latter specimens being more homogeneous than the others, and it would require far more tests to be made before any definite law as to the resistance per square inch of bed increasing or diminishing with an increase of the size, could be formulated. In any case the experiments point to one conclusion,—viz., that the results recorded in the "Transactions of the Royal Institute of British Architects," for 1863-4,\* must by no means be implicitly relied on. In the tests of prisms of stone of the same area of bed but less height than the cubes, the results were invariably that the less the height as compared with the bed, the greater the strength of the specimen per square inch of bed. This almost appears to show that the particles of the material are acted upon by pressure much in the same way as columns, and that the smaller their height the less is their liability to be forced out sideways. But we still cannot avoid expressing our belief that the data are insufficient for laying down a precise formula such as the complicated one given by Colonel Gillmore on page 33.

The experiments on cubes and prisms of neat cement are not so interesting as those on blocks of cement, mortar, and concrete of varying proportions, as very few previous experiments on these materials have been made. Two kinds of cement were used, but neither is known in this country. The general results obtained may be summarised thus:—(1) That in comparing specimens of mortar made with varying proportions of sand, those which were strongest in cement bore the heaviest strain; (2) That in comparing mortars with concrete—the latter having in each case six volumes of broken stone added to the ingredients of the mortars—the concretes were the strongest. A few tests of brick piers, laid in cement gauged 1 cement to 2 sand, were made, and the average crushing strength was 119 tons per square foot. This is a far higher strength than is given in English text-books, and we have always believed that these have erred on the

side of safety if good bricks and cement are used, but it would be manifestly wrong to rely upon a high compressive strength for many of the bricks which are now sold in the English market.

By far the most important results of the experiments which we are describing are those observed during the process of crushing, as these throw light on the resilience and the elasticity of the material, which, as we stated, are the most important qualities. We must refer the reader who is interested in the subject to the tables of experiments, but we may say that Colonel Gillmore may fairly claim to have proved that some law, similar to that which Wohler discovered in the case of iron, does undoubtedly hold good with such materials as stone, brick, and concrete, viz., that the taking off a load and then putting it on again weakens the material more than if the load were continued, and that constant repetitions and relaxations of the load exert a very prejudicial effect on the material. For instance, a 16-in. concrete cube, which was ultimately broken with a load of 268,400 lb., was regularly loaded up to 50,000 lb., and the compression was measured at '0048 in.; 45,000 lb. was then taken off and the set was measured at '0028 in.; upon again raising the load to 50,000 lb. the compression was found to be '0049 in., and the load was then regularly increased to 100,000 and the measured compression was '0083 in.; the pressure was again reduced to 5,000 lb. and the set again measured at '0042 in.; when the pressure of 100,000 lb. was again applied the compression was found to be '0090, or an additional compression of '0007 in. with the same weight. At 150,000 lb. similar measurements were taken, with the result that the compression after relaxation was '0012 in. more than before. Similar results were obtained with the freestone, the neat cement, the mortar, and the brick piers. If these results should be confirmed by future experiments, it would seem that concrete suffers very slight diminution of elasticity when loaded up to nearly one-third of its ultimate crushing strength. The whole of the tables of observation and the diagrams of strain-curves are well worthy of careful study, not only for themselves, but because they are very suggestive of the lines which should be taken by future investigators. Our chief complaint of the work in question is that it is too pretentious. Colonel Gillmore has been unable to resist the temptation of attempting to lay down general rules from inadequate data, and before the conclusions which he suggests as probable can be accepted it will be necessary to carry out far more numerous experiments. We should be glad to see the tables and strain-curves, with the observations made during the experiments, published in a much less expensive form.

#### NOTES.



WE have received a circular from the Honorary Secretary of the Irish Exhibition (Lord Arthur Hill) embodying the following remarks:—

"Lately there has been a great increase in the articles, such as lace, embroidery, underclothing, painting, knitting, wood-carving, &c., sent over to the Old Irish Market Place by poor peasants in Ireland. In most cases this work is the vendors' sole means of support, and it is most desirable that it should not be returned to them unused. Visitors to the Irish Exhibition would be giving material help and encouragement to these poor peasants by going to the Old Irish Market Place, and making some purchases, however small."

While complying with what we presume to be the wishes of the Honorary Secretary by giving further circulation to this appeal, we cannot help pointing out that those who are thus endeavouring, with the best motives, to create an artificial market for the products of the industry of the Irish poor, are acting in a most illogical manner, and showing a very doubtful kind of philanthropy towards their Irish protégés. A request of this kind, thus worded, is in fact simply an appeal for charity veiled under a thin pretext of another kind; and if the effort succeeds in creating a kind

of small artificial demand for these Irish products this year, it will only be at the cost of encouraging false hopes of a similar market next year. Considering that the Irish Exhibition has been largely got up and supported by people who profess to be philanthropists of the modern rational (or rationalistic) school, we have seen with astonishment the constant repetition of these appeals to the English public to discover a want for certain classes of goods, because they are made by Irish peasantry. We would give our hearty support to anything that would do good to the deserving poor in Ireland; but this will do no good.

THE struggle for life seems to be still in a doubtful stage at Windsor, where the insanitary state of many of the poorer houses has been the subject of comment in our columns from time to time for many years past. Certain houses in Distil House-row have been reported on as unhealthy four years ago by the Medical Officer of Health, in consequence of their having the waste-pipes in direct connexion with the drain, and only protected by a bell-trap. A fatal case of diphtheria is traced to this cause by the medical officer, and he has now reported the houses to the urban sanitary authority as unfit for habitation, in consequence of this defect and deficient w.c. accommodation. We have now to see for how much longer they will remain in their present state before any actual improvement is made. Windsor seems one of the slowest places at sanitary reform in the world.

THOSE who are interested in the very multifarious provisions of the Local Government Act just passed, will find their consideration of it assisted by a "Popular Summary" of the Law Relating to Local Government,\* drawn up by Mr. G. F. Chambers. This summary is in itself a considerable piece of reading, but it sets forth, in a readily intelligible form, statements of the practical effect and working of the Act in its bearing upon various departments of public work and procedure, with reference to the sections of the Act under which these provisions are respectively dealt with.

DR. DÖRPFELD publishes in the *Mittheilungen* of the German Institute at Athens (vol. xiii. part 2, 1888) a paper which will somewhat startle the archaeological world. During the excavations at the Dipylon Gate, the mouth of a large cloaca a little to the south-west of the actual Dipylon was discovered. This cloaca debouches through the city walls just at the point which we have been taught to venerate as the site of the "Sacred Gate." Dr. Dörpfeld believes there was no sacred gate at all, but that the term was only a second name once used of the Dipylon, through which the Eleusinian procession went. This, however, he does not hold to be proved. Revolutionary as this view is, there are disclosures more surprising behind. Topographers have certainly been in difficulties what to do with the river Eridanus,—which of the small streams running into the Ilissus was to be identified with it. Leake made it out to be the small stream rising near the Kaesariani Convent. Wachsmuth put it on the right bank of the Ilissus; Lolling holds it to be the Kykloboros. Dr. Dörpfeld, from an examination of the lie of the ground, and from the existing springs and watercourses of the modern city, comes to the conclusion that a river must have flowed right through the ancient city to the north of the Acropolis, rising in the south-west slopes of Lycabettus, passing through the so-called Sacred Gate north-west of the Pnyx hills, and finally joining the Ilissus where the modern road to the Perreus runs, and that this river was the Eridanus. If this is so, the *loci classici* on the Eridanus, in Strabo, Plato, and Pausanias are capable now, by the light of the new discovery, of simple straightforward interpretation. Surprise will naturally be felt that if the Eridanus flowed straight through the ancient

\* See Tr. R.I.B.A., vol. xv., p. 168.

\* London: Stevens & Sons; 1888.



mention of it is so rare. Dr. Dörpfeld says out that this is explained by the fact that the river was at an early time not only used by bridges, but almost entirely covered in, and he points to the pertinent illustrative fact that there are many inhabitants of Berlin who have never seen the river flows through their own "Graben."

THE number is altogether a brilliant one. We can only briefly call attention to Winter's paper on his own interesting narration of the famous Moschophotos, which we noted some time back. It is for the text of a most important discussion of early Attic art, and the influence of the school upon it. It will now no longer be possible to label a statue found at Athens merely "Early Attic." The vast recent discovery of archaic statues is beginning to rate up into distinguishable classes, in which already pre-Chian and post-Chian are readily discernible. It is fortunate that in the very same number, Dr. Six brings his most ingenious restoration of the kladai and Archemos basis, a restoration delightfully neat and satisfactory that one bet trembles to accept it. Accepted, it is for ever the question, long disputed, whether the winged Niké belongs to the pre-Chian, and it gives us a certain standpoint and criterion for early Chian work that we have not date for no other school. It is a piece of the greatest good fortune that the Acropolis excavations have yielded the actual signature of Archemos, so that this Chian influence is a matter of mere conjecture.

DR some time past a correspondence has been going on in the columns of the Builder respecting railway fares and facilities. Though the original question was the "one is only" proposition, other matters were imported into the discussion, and a very interesting letter appeared last Friday from John M. Cook, of "Tourist" fame, commending the facilities afforded by our railways to those of other countries. It has frequently been argued (and proved) that in the matter of charges for goods-traffic the English manufacturer is at a disadvantage compared with his foreign competitors,—a state of things brought about by a number of different circumstances. But, as regards the convenience, safety, and speed of our passenger system, we can hold our own against any country. There are generally discontented people ready to disparage our system, because in minor matters are managed better on the Continent or in America; but Mr. Cook emphasises the undoubted fact that in exchanging with any other country we should be courting evils that we know not of. He sums up his wide experience as follows:—"I do not state to say that there is no empire, kingdom, or country in which the general travel-public of every class and every grade is afforded such facilities and such low fares as those afforded them as those afforded by the British railway companies in general." That is an authority as Mr. Cook should have ended at such a conclusion,—after having, as incidentally remarks, travelled more than 60 miles annually for upwards of twenty years,—must be highly gratifying both to the laudatory mind and to the railway companies themselves; although the latter will be allowed to rest on their laurels. The reform is still needed in the minor matters alluded to. Punctuality is a virtue in which some of our companies are very deficient, and the conditions under which return tickets are issued are often so unreasonable, that the question of "return tickets good till used" is worthy of consideration. It is extremely irritating to be called upon to forfeit a ticket without having received full value for the money paid for it, the regulation prohibiting the transfer of tickets is often a ridiculous absurdity. The statement that the fares in this country are now as in any other will be received with surprise, as we have been accustomed to look that for the superior accommodation which we enjoy we have to pay in proportion.

The late Mr. Grierison, in the course of his defence of the English railways in "Railway Rates, English and Foreign," admits that the passenger fares in Belgium are lower than in this country, and writers in the *Times* during the present controversy have referred to the low rates in force in America. With the latter point, however, Mr. Cook ably deals in his letter; and, as he tells us that his interests are now greater on the Continent than in his own country, his conclusions must be received with the respect due to a, perhaps, unparalleled experience.

THE current number of the *Scottish Art Review* devotes a short article to enquiring why the new municipal buildings at Glasgow are not "what they might have been," a feeling which is said to be making its way "among the discriminating." We thought people, even in Glasgow, would begin to find that out before long. The critic has no objection to make to the general style selected, nor to the disposition of the ground-plan. The demerits he considers to lie in "an undue preponderance of horizontal lines, a faulty system of fenestration, producing a want of unbroken wall-spaces, a lack of artistic refinement in the details, and an over-lavish use of sculpture." In regard to the fenestration, the *Scottish Art Review* refers especially to the use of the so-called Venetian window, an arched compartment in the centre, and small square-headed compartments at the sides, separated from it by columns. The *Scottish* critic objects to this form of window that it destroys repose in a building, and is especially at variance with the leading horizontal lines of a classic design. We share his feeling about that form of window, which we have always thought one of the most artificial and unsatisfactory forms of window-opening. As to the other detailed criticisms, they may be true in general, but they do not touch the real defect of the building, which is in many respects a praiseworthy one, carried out with care and without sparing trouble, and so far creditable to its architect. But there is not a touch of genius about it. It is a respectable building, but absolutely uninteresting, and this we knew very well would be the final verdict on it at the time the design was selected. It will do very well for its purpose, but no one will be made happier by it, and no one will come to Glasgow to see it.

WHILE referring to the subject mentioned above, we may congratulate the *Scottish Art Review* on its continued high style of art criticism, and the generally cultivated tone of its literary matter. Glasgow is not, we fear, essentially an artistic town at present, but there appears to be a leaven of righteous men in it who will probably get up an artistic public spirit in time.

WE have received a card of invitation to what is called the "Continental Gallery" in New Bond-street, to see what is described as a collection of "the most remarkable paintings of this year from the Paris Salon." The announcement is little better than a fraud on public credulity. The collection does not contain a single one of the pictures which were prominent at the Salon Exhibition, and only one or two even by eminent names. The majority are of the most commonplace description, and many of them are mere artistic rubbish. To placard these as the most important and remarkable pictures of this year's Salon is an insult to French art. Of course the initiated know very well that it is not likely the best works from the Salon would come over here: they are commissioned or purchased in France; but the managers of a picture gallery have no right to gull the more ignorant public by announcements so completely at variance with fact.

**Wiley Park, Shropshire.**—A large Cambridge chiming clock was completed last week in the parish church here, the gift of the Right Hon. and Rev. Lord Forester. The makers are Messrs. John Smith & Sons, of Derby.

## SCIENCE AND MANUFACTURE.

AT the annual meetings of the British Association for the Advancement of Science we are informed what new discoveries have been made,—that is, a few of the most startling; and by the graciousness of the professors of science, and of those who apply it to the useful arts, a review of some of the discoveries and experiments which have been made during a term of years is placed before the meeting; all made as delightful as possible, not omitting a few jokes, or at least attempts which show the joyous spirit of the occasion.

But although science has its charms for a few,—those, namely, who can devote their lives to it,—it has not much charm for many who cannot do so. These, who have to earn their daily bread in one way or another, in some of the industrial arts of life, cannot know everything, for want of time, and in most cases for want of a previous education which would enable them to attain the knowledge. And it is not necessary, even if possible, that those who make things should each on his own account undertake an original research into the qualities and properties of the materials he uses and forms into articles of commerce; but it is yet very necessary that each should be informed of those qualities and properties which he cannot know by his own investigation. It is for the professors of science to see that the makers of things are each taught the nature of the material he uses, for, understanding its nature, he may produce without waste an article of value, because one of beauty as well as of use. It is for the professors of science to give this information to all who desire to have it. If, besides the makers of things, we regard the carriers of articles of commerce, whatever they may consist of or by whomsoever made (for it is said that we are now a nation of carriers, not shopkeepers), the case is still the same, for the means of carriage have to be provided, and this involves the making of appropriate implements and ways by which they may be transported, whether by land or sea; and the whole question is how to make things. As they must be made by the many, and as these cannot have a full knowledge of the nature of everything, they await the teaching of those who have that knowledge, by which they may learn the true nature of every material they use and apply. It may not be necessary to the immediate result that the workman shall himself understand these things; if the master understands them, and the workman is sufficiently intelligent to obey orders, that may be sufficient for the time. But, at least, the master must know the nature of the materials he uses, if trade is to be kept going. The workman, indeed, if he is wise, will not seek to know these things, for he cannot do so without the loss of that nerve and muscle which are his peculiar possession as workman,—nerve to give direction to the tool and muscle to compel its movement. The workman cannot attain a full knowledge of the nature of his materials without an amount of study which unfits him for his daily work, and a little knowledge of them is dangerous because it will probably seem to be sufficient when it is not really so; and the pursuit of the knowledge in full is to him too tiresome. So far as science is amusing it is worth the workman's attention, and that it is sometimes amusing we see by the attendance of so many people at the annual meetings of the British Association for its advancement; but, otherwise it does not make a man happy; it opens so many avenues of thought that the mind alone groans while the body starves. To shut the door of each avenue as soon as it has stood open long enough for personal happiness is the act of a wise man, if his circumstances are those of average men; but who can be at all times wise? Truly, we see a few of the professors of science, who appear round and sound enough in wind and limb, but they probably have had exceptional advantages and facilities for acquiring knowledge; but, whether with much or little difficulty, the knowledge of the nature of things is proper to be had by those who are able and willing to devote themselves to it, and to inform the world when they are assured of the truth of what they have discovered, by a sufficiently long examination of all the facts upon which their reasoning is to be based.

Persons in the average circumstances of life cannot do this, and knowledge which falls short of it is worse than none—knowledge, observe, not information, which is a very different thing. The man who knows,—the professor, say, of a science,—can impart information to persons





Hatfield House. — From a Sketch by Mr. J. Johnson.

whom he could never make to know what he knows, teach he ever so long; but the information he can give them (for their gratification, not knowledge) may be very useful to them in many ways, and they can put it to practical use every day.

Of course, they have to trust what they hear to be true, to be full, to be honest, to be in every respect made in good faith; and this information, so imparted, is more useful to them than pseudo-investigations, which land them nowhere, more puzzled and uncertain than ever.

It remains that exact knowledge of all materials should be taught by competent professors to all who make things for sale abroad or use at home. We should be better off at home if workmen felt they understood the nature of the materials they use, and that to do the work well was a matter of interest to them; they would be quickened in spirit, and welfare would ensue. If this cannot be done—whether for politico-economical reasons or any other—at least the employers of workmen may be so instructed, and possibly the spirit of the master may inform the rest. When the very great number of materials is considered which are daily worked upon in England, it will be seen how far and how much science is required in their use; notwithstanding that the whole subject may cover but a small part of the ground of science altogether.

Sir Frederick Bramwell, the President of the Association for the ensuing year, is a civil engineer, using that term in its full sense as embracing all engineering other than military, and in his address to the meeting the other day at Bath he said that, although engineering does not contribute much to pure science by original research, but devotes itself more to the application of science in following its art of directing the great sources of power in nature to the use and convenience of man, yet, for the very object of the Association, the advancement of science, it is absolutely necessary there should be the application of science.

Abstract science, or original research, and its application, as in engineering, act and react upon each other, it was said,—an illustration of which was the story of Galileo, Torricelli, and the pump-maker; that Galileo first, and his pupil Torricelli afterwards, were led to investigate the question of atmospheric pressure by observing the failure of a pump to raise water by suction above a certain level, and these men of science, reflecting upon what they saw, discovered the conditions under which water rises in a pipe from which the atmospheric air has been removed.

This illustration serves as well as any other to show the truth of many things about which people dispute. The inventor's principle is, what you find, keep; it is yours if nobody owns it. What you discover apply to your own advantage to the exclusion of everybody else. This principle is good or it is bad, according to what it refers to, whether to the application of a universal law of nature already discovered, or to the discovery of the law itself. Galileo and

Torricelli discovered the conditions under which a universal property exists, and proclaimed them; the knowledge is public property; but being so, an individual has no personal interest in pursuing such researches; they must be undertaken, if done at all, by those who work for ends other than private ones. It is the application only of these to special purposes which it is worth the while of the individual to follow out. He does, indeed, pursue them in a small way for commercial purposes, but stops when those ends have been attained. The one, in short, is science; the other, engineering or manufacturing.

A worthy tribute to the memory of one of the greatest of scientific men was made by the late President of the Association, Sir Henry E. Roscoe. When the Association last visited the city of Bath, in 1864, its President was Sir Charles Lyell, the great forerunner of that system of geology which has for its principle that the action of small things such as rain, as we now see it; frost, as we now feel it; and other occurrences such as take place at the present time, are sufficient, often enough repeated, to account for the vast changes which have evidently taken place in the ground beneath our feet since its formation.

Lyell, said the late President, was a typical example of the expositor of nature's most secret processes. His work was that of an investigator of science pure and undefiled, and as such his life and labours stand for ever as an example to all those who love science for her own sake; but then, as now, it was recognised that just as man does not live by bread alone, so it is not only by purely scientific discovery that the nations progress or that science advances; the application of the results of scientific research to the great problems of everyday life is a necessity.

#### HATFIELD HOUSE.

This sketch of Hatfield House, for which we are indebted to Mr. J. Johnson, may be of interest in connexion with the account of the visit of the Architectural Association to Hatfield, and the paper on it by Mr. Gotch, reported in our last number (page 191 2, ante).

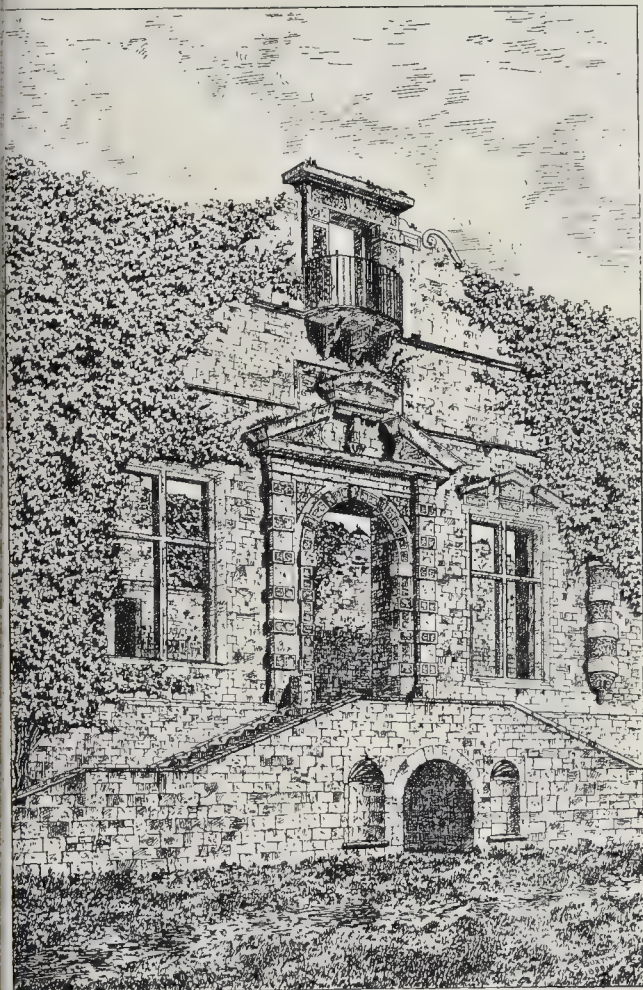
#### YORKSHIRE ARCHÆOLOGICAL ASSOCIATION AT FOUNTAIN'S ABBEY.

LAST week this Association paid a special visit to the abbey to hear an account from Mr. St. John Hope of the results of some recent excavations made by him on the site of the abbey. Mr. Micklethwaite previously read a paper on the "Cistercian Rule;" and after a short address from the Marquis of Ripon, who expressed his gratitude to the Society for the work they were doing in connexion with the elucidation of the history of the abbey, Mr. St. John

Hope conducted the members over the abbey. He prefaced his remarks\* by sketching the foundation and early history of the abbey, after which, in the course of his general observations, he said it was not easy to discover the original disposition of the church. The popular notion was that when, in Mediæval times, people built a church like that, they intended to have a grand view from end to end. That was an erroneous opinion. They built in that manner because it was the easiest way of building, and having got their erection, they proceeded to cut it up by screens. There was no documentary evidence to tell them how the house at Fountains was divided, but the original limits of the church were different to what they were now. He could not say whether the nave and the aisles showed their original setting out. The limits of the early choir were marked out by thin lines in the grass upon the platform near where he was standing. The Cistercians seemed to have generally completed the plan of a church before going on with the other portions of their structure. The choir originally, like most Cistercian choirs, was flanked on either side by three chapels projecting eastward from the transept. The old choir must have been very dark, because there was just room for a narrow window on either side. There was very good and clear proof of walls dividing the church from end to end, and in some of the Cistercian abbeys they were marked even more strongly than at Fountains. The evidence as to the *conversi* stalls he was not quite sure about, but three of the pillars on either side had the plinths chopped down, and his theory was that that had been done to fit the ranges of stalls. Another feature was that the aisles and the nave were cut by screens at intervals into a number of chapels. There was a chapel in almost every bay. The roofing of the aisles was peculiar. The ordinary way was to have a regular vaulting right along, but here an arch was thrown from the pillar to the wall, and then a pointed barrel vault from arch to arch. It was rather a weak form of building, and not at all English in feature. There were strong indications of an organ having been erected at the west end, because against the pier there were cuts for two very strong beams, and other marks. Against the west end of the choir there was a solid stone screen, with a sort of music gallery on the top. Between two screens there was a space in which sick brethren used to sit on a bench. There was a great rood screen, with images of Our Lady and St. John. In the last few days he had excavated the pits underneath the upper rank of stalls, and the total number of earthenware pots found embedded in the walls had now reached the number of twenty-four. One authority advanced the theory that they were put there to augment the sound of the music; but on the south side there were no traces of pots, and it might be that the singing

\* We take the report as given in the *Leeds Mercury*.





At Bolsover Castle. - From a Sketch by Mr. A. S. Buxton.

as better on that side than on the north.\* hat the central tower collapsed at an early ate was clear by the buttresses. The community must have first under-pinned the Norman work, and then, finding that to be of no use, ad built the great buttress, which looked glier now than when the stalls ran past it. The entral tower had fallen certainly just before he suppression of the house. The great tower as one of the most imposing in the North f England. Near it was an altar to St. Michael the Archangel, with a bracket for the mage of the Archangel. The Norman part of he choir was utterly gone, and even of the later work there were no remains whatever. What was commonly known as the altar platform, nd was supposed to have been the high altar, was nothing of the kind. The high altar was a old piece of masonry rising through the ound, and that was not it at all. Behind is platform, and underneath the perpen- icular window, were the nine altars against he east wall. Each altar was divided by a old stone wall, and subsequently the number as reduced from nine to one. The whole of hese altars were screened off from one another nd from the church, so as to leave a passage rom end to end.

\* We need hardly observe that this explanation of the re-quent building of pots into the walls of the choir of a church is a very old one, and not so absurd as Mr. Hope seems to have implied. Has he any other explanation to suggest?—Ed.

#### BOLSOVER CASTLE.

MR. A. S. BUXTON sends us the accompanying sketch of part of the ruined portion of Bolsover Castle, in illustration of the recent visit of the Architectural Association during their annual excursion, reported in the *Builder* of August 18 (page 118).

#### Remains of a Norwegian Cloister.—

Herr Nicolaysen, Norwegian State antiquarian, has just completed the excavation of the ruins of an ancient monastery, on the west coast of Norway. The assembly-hall, sacristy, and refectory have been laid bare, as well as the covered corridor running along the courtyard. The roof of the assembly-hall appears to have been supported by a huge pillar in the centre. A large number of finely-cut sandstone blocks have also been found, making certain parts of the edifice almost complete. These blocks were obtained from a quarry close by, celebrated for the quality of its stone in olden times. All the details of the architecture show a rich and advanced Romanesque style, and the interior arrangements are generally identical with those found in early English monasteries. The whole building remains form a square, with the chapel on one side and the dwellings on the two others, the fourth being a brick wall. A few graves were encountered, but only one contained human remains. The skeleton is believed to be that of an abbot, from the cloak and mitre found with it.

#### WELBECK ABBEY AND ITS TUNNELS.

WELBECK ABBEY is situated in the midst of that district of Nottinghamshire still known as Sherwood Forest, though a large portion of it has long been disafforested. The Abbey forms also a part of the "Dukeries,"—a tract of well-wooded lands so called because within a circle of ten miles there were no less than four mansions once owned by Dukes, viz.: Thoresby, the Duke of Kingston's; Worksop Manor, the Duke of Norfolk's; Clumber, the Duke of Newcastle's; and, lastly, Welbeck Abbey, the seat of the Dukes of Portland since the middle of the last century. Worksop no longer stands in its entirety; Thoresby now belongs to Lord Manvers; but Clumber and Welbeck still have ducal owners.

As is well known, ever since the death of the fourth Duke of Portland, in 1854, very extensive works have been carried on underground at Welbeck, works about which a sort of mystery hangs, as well as about the fifth Duke, who designed them and carried them out. For some reason of his own, the Duke shunned the very sight of strangers, and he was in other ways also eccentric; but his chief eccentricity lay in the fact that he had come to the same conclusion as the aboriginal Britons, namely, that an apartment wholly or mostly underground has the double advantage of being warm in winter and cool in summer. To this, apparently, he had added a conviction that, if it could only be lighted, such a dwelling would be more comfortable than one wholly above ground, and exposed to the alternations of frost and of heat which mark the English climate. Possibly he had read in Virgil's "Georgics" of our and his own forefathers' doings nineteen or twenty centuries ago,

"Ipsi in defossis specubus secreta sub altis  
Otus agunt terra."

and what they did rudely and crudely he resolved to execute in a more scientific manner. The Duke was fond of planning and designing; he was a first-rate amateur carpenter; and so he resolved, without destroying the noble building which he had inherited, to add to it another structure, or rather another series of structures, which should make it unique at all events among "the stately homes of England." Accordingly, he had not been very long in possession of Welbeck before he commenced the work of carrying out his designs, still only partly completed.

During the eighteen years that this Duke reigned at Welbeck, he is said to have carried out his building experiments at an outlay of £100,000 annually, and to have kept in active employ an army of 1,500 workmen, more or less skilled; indeed, writes the author of a local guide-book, "the villages of Holbeck and Whitwell owe a large proportion of their population to the apparently interminable works going on there." In fact, he showed himself a greater friend of "bricks and mortar"—or rather of hewn stone—than even Bess of Hardwicke. On account of the seclusion in which he lived, and the great reluctance which he felt to allow any part of Welbeck to be seen by strangers, he was known throughout Sherwood—and, indeed, through Nottinghamshire—as "the invisible prince;" and when it became known that he was excavating a new site in his Park, not far from the Abbey walls, for an entirely new subterranean structure, his neighbours indulged in all sorts of speculations as to whether the site was intended for a chapel, a library, or a ball-room.

It may be well, however, to state more in detail the improvements at Welbeck which are due to the late duke. First of all, the Abbey itself, we mean the part used for a private residence and facing the lake, was very low in comparison with its great extent of front; and therefore the Duke added a story to it, at the same time improving its internal decorations. Then, again, one of the great features of Welbeck Abbey, as it was known to visitors during the last century and the first half of this, was its great Riding House, erected by William Cavendish, the first duke, in the reign of Queen Anne and George I. This building the late owner converted into a gallery, in which to exhibit his fine collection of family pictures from Sir Peter Lely down to Sir Joshua Reynolds and the modern school. He increased its length to 180 ft.; he removed its ancient roof, substituting for it a new roof of corrugated copper, lined within with carved wood in the style of Westminster Hall; he panelled the walls after a new fashion, lining them with silvered glass, about a yard in depth, with cut-glass mouldings, and lighting the huge apartment with some



two thousand gas-lights, which, when lit up, give a most brilliant effect. He also inserted four huge chandeliers, each weighing something over a ton. "On the roof he added two turrets, in one of which is a clock of unique construction, made of hard gun-metal, and showing the time on four illuminated dials, striking the hours and the quarters; while in the other he placed a timepiece showing the time on two dials, driving two calendars showing the month, the day of the week, and the age of the moon, and equation of time on two dials." These were made by Messrs. Benson, of London. This building, as to the destination of which so many strange surmises were afloat, is now used as a picture-gallery, one end being screened off by a large thick curtain and used as a chapel. This picture-gallery covers a rood in area. Another huge structure of the same character, partly underground, is the library. It may be added that the present Duke has withdrawn many of the restrictions imposed by his predecessor on the admission of visitors, and thus has dispelled much of that air of mystery which surrounded the place.

But "in the lowest depths," they say, "there is a lower still," and so beneath this half-underground structure immense wine-cellarars have been dug out and made, and lined with bins, all of cast-iron; and subterranean passages connect these cellars with the Abbey itself, the kitchen, and the servants' apartments, almost of palatial magnitude. The kitchen, it should be here remarked, stands at a respectful distance from the Abbey, and "its arrangements combine everything which art, wealth, and ingenuity could devise to render it complete." And our readers must not think that we are romancing when we add that the diners are conveyed to the dining-room in the Abbey proper from these apartments by a short underground railway.

In other respects, also, the late Duke so far altered and improved the Welbeck which was built in semi-monastic style in 1604, that the only surviving architectural gem now to be discovered *in statu quo* is the Gothic Hall, which was restored by the Countess of Oxford, his maternal ancestress, in 1751.

But the most extraordinary of all the late Duke's building works, and that which has been most widely spoken of, is the subterranean roadway which he formed through a portion of his park, even carrying it by a tunnel under the great lake. This roadway he designed in order to supersede the road through the park to which the public had, from time immemorial, a "right of way," and which the stout yeomen of Sherwood Forest would not be inclined to allow even "the Duke" to stop up, any more than the inhabitants of Sevenoaks would allow the Lord of Knole to shut his gates against them. Still, the Duke resolved to find out a way to satisfy the law, and yet, at the same time, to gratify his taste for seclusion. He accordingly first sunk the roadway several feet underground, so that the eyes of passers-by were just on a level with the turf; and then, as in winter this sunk way would hold the rain, and not suffer it to escape, he arched it over partly with glass and partly with turf, externally removing the eyesore of long glazed roofing by plantations of rhododendrons and other flowering shrubs. This passage which cuts off more than a mile between the Abbey and the neighbouring town of Worksop, is lined with glazed white bricks, and lighted from above by circular lights of plate glass; these are twelve yards apart, with intermediate gas-lights, which are kept burning day and night, for the convenience of passengers. This tunnel, though large enough to admit a carriage and four, is used only by the carriages of the family and their visitors, being shut against others, as there was no right of way above ground for other than foot-passengers. In this subterranean road the Duke has placed a drinking-fountain, which now takes the place of the Welbeck Ale, which was formerly at the command of every wayfarer who chose to call at the Abbey gates. One of the local guide-books ascribes this fountain to the late Duke's "usual thoughtfulness" for others; while another alludes to it sneeringly as an arrangement due to parsimony. The entrance to this subway is opposite the South Lodge of the Worksop Manor estate, from which Welbeck is generally approached by visitors, and the roadway itself terminates, not at the Abbey itself, but at the new buildings near Holbeck. It is about a mile and a half in length. About these new buildings, distant half a mile from the Abbey, we must now speak.

On emerging into the light of day from this tunnel, through some portion of which he must pass from whatever point he enters the park, the visitor finds himself face to face with a long series of new buildings of stone, divided into separate blocks. Before him is the building used as a school, and on the right and left are the abodes of the coachmen, stablemen, and groom. The principal stable forms a quadrangle, at the gate of which the visitor will find someone to show him in what direction to turn; for, to say the truth, it is rather a perplexing task to find one's way about this huge encampment—for such it seems to be. In the far distance before us we see a long range of buildings, in a style apparently imitating the Abbey itself, and for which, indeed, they are often mistaken; but these are only the farm-buildings, including the timber-yards, &c. On his left is the new Riding-house, which is no less than 385 ft. in length, over 100 ft. in width, and over 50 ft. in height. It is built of the native stone of the district. The roof is in three divisions, not unlike the nave and side aisles of a cathedral; the central one is circular, and made of iron and glass; the two side roofs are made of pitch-pine, covered with copper.

The hunting stables are fitted up with accommodation for a hundred horses, and are all fitted in a most luxurious manner, so that the saying in the neighbourhood is, "Better be a horse at Welbeck than a weaver at Nottingham." The floors are bright and gay with encaustic tiles; and the brasswork of the doors and managers is kept bright and polished, and we do not to the groom who neglects this work. Another large range of stables is devoted to the Duke's carriage-horses, and these and the coach-houses beyond are fitted up in the same expensive style. Other substantial buildings are grouped, at different distances, and apparently on no fixed plan, around the stabling, to which they are evidently regarded as subservient. On one side are the steward's offices, on another is a canteen, and on another the common room of the grooms, stablemen, and jockeys. Beyond these, again, is a spacious poultry-yard, with ornamental out-buildings, and a dairy of the newest and most costly fashion, lined with glazed tiles throughout, and kept cool by a *jet d'eau* in the centre, which plays day and night; and further still are an immense cow-house and a laundry, both designed and constructed on the newest and most approved plan. In another part of this remote portion of what we have termed the Welbeck encampment are the timber-yards. These yards are on a most extensive scale, and stand in the same relation to the Welbeck settlement as the kitchen does to the Abbey itself. The local guide-book writes: "They contain machinery of the very best construction for sawing timber with upright and circular saws, a saw-sharpening machine, with arrangements for steaming and steeping timber for preservative purposes. The shafting works are under the floors, and the machinery is driven by a steam-engine of thirty-five horsepower." The kennels are still further off, a mile-and-a-half away.

In a line with the northern side of the new stables is an arcade, covered with glass, like that of one of our largest railway stations. This is nearly 1,300 ft. in length, and contains upwards of 64,000 ft. of glass. It was built as a tan-gallop for the exercise of the Duke's horses on rainy days, and in winter, when the ground of the park is frozen. The eastern and western terminations of this "tan-gallop" are of imposing magnitude. Far away, and scarcely visible from here, on the new Worksop and Mansfield road, are the gasworks, erected by the Duke to supply his stables, offices, domestic apartments, and the subterranean roadway.

If the buildings of Welbeck proper are so huge, the accessories of its gardens, hothouses, roseries, and so forth are quite in proportion to them. The range of hothouses and greenhouses close to the Abbey itself is several hundred yards in length, and filled with the choicest of English and foreign specimens. At a cursory glance one would say that they are scarcely surpassed at Sion House or at Windsor Castle. The kitchen garden alone (which is near the new stables) encloses within its walls no less than ten acres, and say nothing of six acres of orchard outside, and the main range of the hothouses here is nearly 800 ft. in length.

The gardens at Welbeck have been remarkable for their productiveness, even from monastic times, for the monks were excellent gardeners, and even in bleak and barren situations they often "made the desert smile."

But here, in the midst of the green glades of Sherwood Forest, they had no such difficulties; all that they had to do was to tell an owner of a well-watered domain. The garden has long been famous for its grapes, especially for the Syrian variety, one specimen of which, weighing nearly twenty pounds, was carried on a pole by two men to Wentworth House, near Rotherham, twenty-five miles further north, as a present to Lord Fitzwilliam. So much in the same way as the grapes from the land of Canaan were carried by the spies in the time of Joshua. In the pleasure-grounds between the Abbey and the new buildings grow many of the Mexican and Himalayan pines and firs, and other trees from North and South America, all in great luxuriance, to say nothing of aucubias and some Indian cedars the seeds of which were sent home to Welbeck by the late Lord William Bentinck when he was Governor-General of India.

But it is not only on *terra firma* that the late Duke of Portland carried out his experiments and improvements. The lake before the Abbey formed originally by damming up a brook was designed by Repton in the reign of George III. It has now been extended nearly to Carburton, and is some three miles in length. It has also been widened in places, and deepened so as to prevent the growth of weeds, and its sides have been planted in such a way as to produce the effect of a natural lake. Added to this the deer park, ten miles in circumference, has been lately surrounded by an iron fence of excellent construction; but this, and the bull's-eyes in the turf of the park, elicit no feelings of gratitude from the fox-hunters of the county. So fond was the Duke of his plan of subterranean burrowings that even in the park lodges of his estate, five-and-thirty in all, he ordered the same construction to be repeated. Most of these lodges would make good, though small, vicarages for country parishes; and even though the stone was close at hand, they must have cost from 700*l.* to 800*l.* a piece. They form pleasing additions to an estate so large that in their absence it would look almost deserted of inhabitants; and a striking feature in their architecture is that the out-offices are all underground, being lit by large circular lights of plate-glass, which produce a curious effect when seen at night.

The Duke has lately had printed, on a small card, a brief summary of the measurements of the various parts of his estate. This card tells us that the underground tunnels measure nearly two miles and a-half; viz., (1) the Main Tunnel, from the Abbey to the junction, 400 yards; from the stables to the junction, 1,170 yards; from the junction to the south lodge, 1,070 yards. (2) The Leper Tunnels: from the Abbey to the south lodge, 1,470 yards; from the dining-room to the riding-school, 1,020 yards. The picture-gallery measures, inside, 63 yards by 159 yards. The riding-school, externally, measures 132 by 36 yards; the tan gallop is 422 yards long; the hunting stables alone stand upon an acre of ground; the gardens, glass-houses, &c., occupy 32 acres; the lakes cover 159 acres; the deer-parks extend over 1,640 acres; and lastly, the iron-fencing round the deer-parks is just ten miles and a-half in length. Such are "The Wonders of Welbeck" in 1888.

One special charm of the park at Welbeck is to be found in its oaks, many of which bear historic names; one of them, the Greendale Oak, has had an archway cut through its sturdy trunk, large enough for a carriage and four horses to drive through it. This and many of its companions are supposed to be a thousand years old; so far back as 1790 they were described by Major Rooke in a book which he published, but which is now very scarce, entitled "Descriptions and Sketches of Remarkable Oaks in Welbeck Park."

Some idea of the huge settlement—for such it really is—that we have here outlined may be formed when we say that from the Abbey, on the margin of the lake, the furthest of the outlying structures is more than a mile distant, and that persons who drive over from Cresswell, and who come on the "new buildings" first, often drive away fancying that they have seen the Abbey itself, though they have not been within half-a-mile of the latter or seen its roof. On leaving the bounds of the Welbeck estate we find the road between the Cresswell Craigs, where the late Duke of Portland has gratified the weary pilgrim's eye by damming up another little stream into a second lake or riverhead. These CRAIGS, on either side of the ravine, are deeply indented



in caves in the rock, partly natural and partly artificial. We would strongly advise the pilgrim who by so fortunate as to get from the Duke of the agent an order to see Welbeck to go. He will thus see the least attractive of the estate first, and gradually work way down to the Abbey itself, leaving the most interesting parts for the last. It will then do well to take a stroll in that part of the park which is accessible to the public, and to leave Welbeck by the underground tunnel for Workop, whence he will go by train. In former days, when railways were not, Welbeck was best approached from the little market town of Ollerton; but this is now forgotten, and scarcely known, save five miles at least from any railway station.

The Abbey of Welbeck, founded in the reign of King Stephen for Premonstratensian Canons of the Cistercian order, was dissolved and suppressed by Henry VIII., when it was bought by a populent clothier named Whalley, who sold it to Edward Osborne, a citizen and clothworker of London. From him it passed, through some intermediate hands, to the Cavendishes, Dukes of Newcastle, the first of whom we have mentioned as the original designer of the Riding-school here, and who is still known as the author of a folio treatise on "Horsemanship." His granddaughter and heiress, Margaret, carried the estate by marriage to Holles, Earl of Oxford, in whom the Dukedom of Newcastle was revived; but it again expired for want of male issue. His daughter and heiress married Harley, Earl of Oxford, the founder of the Harleian Library; and their daughter and heiress in the manner married William, second Duke of Portland, and so caused that family from that day to this to bear the name of Cavendish-Pembroke. The present owner is William John Cavendish, the sixth Duke of Portland, now Master of the Horse to her Majesty. The Duke of the Bentineck family in England was General Bentineck, one of the favourite officers of William III., and his second in command at the Battle of the Boyne.

# APPLIANCES FOR SAVING LIFE AND PROPERTY FROM FIRE.

A LITTLE while ago, when noticing the recent Fire Rescue Exhibition at the West End, we said that we would on a future occasion refer in detail to some of the most typical inventions exhibited for the saving of life and the preservation of property from fire. We are now enabled to notice two of them,—one for saving life and the other for saving property. The "Cuff" Structural Fire Escape is the invention of Captain A. St. George-Cuff, of Burn. This escape consists, essentially, in a balcony, or any number of balconies (according to the number of stories in the building to which the invention is applied) connected with each other and with the ground by ladders (with handrails). These ladders are only lowered when an alarm is given, so that they would not afford facilities for the ascent and descent of burglars. The invention of Captain St. George-Cuff possesses considerable practical merit, as will be seen by the detailed description we give of it, but it must be said that it is only houses of the Harley-street, Wimpole-street, or Baker-street type which would not be injured in appearance by iron balconies of the usual stock character at the level of each floor. But we apprehend that the balconies which are a necessary part of Captain Cuff's fire-escape might be treated architecturally, thus making an effective feature arise out from a constructive necessity.

We quote the following from the inventor's description of his appliance:—

"The invention takes the shape and appearance of an ordinary window balcony, and is attached to each floor of the building. In case of fire the pressure of a lever-handle, pull of an ordinary bell-pull in the chamber or chambers which the balconies are affixed, or pressure on a lever-handle placed in a convenient position on the balcony itself, uses a ladder to descend from the bottom of the balcony, and rest on the floor of the balcony beneath, the lever end attached to the bottom of the floor of the balcony, from which it is lowered by means of an axle. As the ladder is falling into an inclined position at any required angle, a strap-door formed of a portion of the balcony floor rises up, thus the balconies are affixed, by depressing the ladder steps. On reaching the balcony beneath, a similar lever-handle is depressed and a ladder or stairs similarly attached immediately drops. The same operation is repeated on each balcony till the ground is reached. By means of a specially-constructed lock (patented) tied close beside the hall door, a key for which is carried by the policeman on duty, the entire apparatus is actuated by the motion of the key. It matters not how many

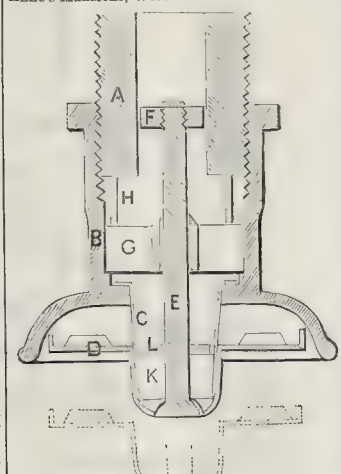
doors there may be to the house, the instant the key is turned in the lock, and while the several ladders or sets of stairs are dropping into position, an alarm is given on each floor or in every sleeping-chamber by means of an electric attachment. The battery most suited is the 'American Continuous Alarm Action.'

There is hardly any possibility of any part of the apparatus failing to act by reason of oxidation, dust, or jamming. The only part that could be affected is the bearing of the ladder or stairs through which the axle passes, and the plumber-blocks in which the axle on which the cams are attached which hold the ladders up when not in use. To prevent rust and dust affecting any parts, all bearings are bushed with gun-metal, and both axles have moveable collars fitting tight with a thumb-screw to admit of their removal when it is deemed necessary to insert a small piece of Russian tallow; the collars can then be replaced and made secure by means of the thumb-screw.

Any person able to pull an ordinary bell-pull, or depress a lever-handle about 1½ in., can instantaneously drop the ladder or stairs. The lever-handle or pull when in the chamber is protected by a frame glazed and locked. In case of sudden emergency the glass is broken, the pieces falling to the floor, the lever-handle or pull can be used. When the lever-handle or pull is placed outside the house beside the balcony, a like protection is provided at the option of the resident.

Any person having the use of his or her hands and legs can have no difficulty in descending. The steps or rungs of the ladders are not round, as in ordinary ladders, but are formed of T-iron riveted at the proper angle; a flat step similar to a stair is provided. The outside of each ladder or stairs has a hand-rail of any desired height."

Working models of this invention which we have seen appear to fully demonstrate the practicability of Captain Cuff's invention, which, indeed, has been already applied to several buildings of importance, including the Imperial Opera House at Moscow. Since the invention was exhibited, we hear that Captain Cuff is fitting a set of his escapes to the London Hospital, Whitechapel-road, and that he has also been commissioned to apply them to the new extensions of Queen Anne's Mansions, Westminster.



Vulcan Sprinkler, Closed.—Actual size.

- |                                |                                         |
|--------------------------------|-----------------------------------------|
| A.—Connecting Nipple.          | F.—Nut, screwed and soldered.           |
| B.—Body, nickel-plated.        | G.—Gallery.                             |
| C.—Copper Tube, nickel-plated. | H.—Distance Piece.                      |
| D.—Deflector, nickel-plated.   | K.—Paraffin Wax and BaCO <sub>3</sub> . |
| E.—Stem, nickel-plated.        | L.—Lead Washer.                         |
- (The dotted line shows position of distributor when open).

The other invention of which we have to speak is one for saving property from fire, and takes the shape of an automatic "sprinkler," known as the "Vulcan." It is the invention of Mr. James Henry Lynde, M.Inst.C.E., of Manchester (son of the late J. G. Lynde, who was for many years, if we mistake not, Borough Surveyor and Engineer of Manchester). We quote the inventor's description of the "sprinkler":—

"The 'Vulcan' is of the sealed type, and depends on its sensitiveness upon two principles, new in their application to sprinklers,—namely, the use of a non-conductor of heat interposed between the sprinkler and the water-pipe, and the prevention of contact between the water and the seal. The advantages of these principles were discovered during a long series of experiments, which were not made for the purpose of inventing a sprinkler, but for ascertaining why certain forms were more sensitive than others. The application of these principles resulted in the construction of two forms of sprinkler, one being suitable for ordinary purposes, and the other specially for the interiors of elevators and other similar situations.

The 'Vulcan,' for ordinary purposes (see section), consists of a brass body, B, connected to the water-pipe by means of wooden nipple, A. This prevents the heat absorbed by the body being conducted into the water and pipe, thereby retaining it where it is required. The brass body, B, terminates at its lower end in a short copper tube, C, projecting downwards. Over the orifice of this tube a cap, D, is secured by sensitive solder. The cap forms the central part of the distributor, D, which is provided with diagonal sails projecting upwards. Into the centre of the cap is fixed a stem, E, which passes upwards into the body of the sprinkler, through the gallery, G, and terminating with a brass nut, F, which is both screwed and soldered to it. In the interior of the tube, C, terminating the lower part of the body, is placed a plug of paraffin wax and carbonate of barium, K, which is covered with a lead washer, L. This mixture has the double effect of preventing contact between water and the seal of sensitive solder, and also of lubricating the parts when the sprinkler opens. The specific gravity of this mixture is 1.65, or about 1½ times heavier than water; its tendency, therefore, in the melted state, is to remain in its proper position. Both the substances used in this mixture are chemically inert, and no chemical action or combination takes place. It is a curious fact that when once this mixture has been made it is impossible again to separate the substances, unless by solution in ether, or by heat sufficient to evaporate the paraffin wax. Enquiry shows this peculiar property to be new to science. If paraffin wax is mixed with precipitated chalk (which is similar in its nature to carbonate of barium) and placed in water and warmed, the paraffin wax at once leaves the precipitated chalk and floats on the water, the separation being complete. In one case the mixture is friendly and in the other unfriendly. The melting-point of the mixture is 135 deg. Fahrenheit, or about 25 deg. Fahrenheit lower than that of the sensitive solder.

The action of the 'Vulcan' Sprinkler is as follows: When the temperature of the air in which it is situated reaches 135 deg. Fahrenheit, the mixture of paraffin wax and carbonate of barium melts, and assumes the consistency of thick porridge. Being heavier than water, it remains interposed between the sensitive solder and the water. When the sensitive solder has melted, the cap, with its deflector, D, and stem E, drops downward until a proper aperture has been formed for the escape of the water. It then rests upon the gallery, G, by means of the nut, F, at its upper end. The water impinges upon the distributor, and, by means of the diagonal sails, causes it to spin rapidly and distribute the water evenly over the space it is properly intended to protect. If the deflector be forcibly prevented from revolving it acts as a fixed deflector, and gives a satisfactory distribution. The outer surface of all exposed metal is nickel-plated, in order to prevent corrosion by the products of gas combustion. The 'Vulcan' is fitted up in a similar manner to that adopted in the case of other sprinklers."

It remains to be said that by a very ingenious mechanical arrangement, the flow of water ensuing on the coming into play of one of these sprinklers can be made to ring a large bell or blow a steam-whistle, or both. The object of giving an alarm of this kind is to apprise the custodians of the building, as an additional precaution, especially with a view to prevent undue damage by the flow of water after the fire has been extinguished.

**Historical and Archaeological Association of Ireland.**—This Association will hold its next quarterly general meeting in the Court-house, Cashel, on Wednesday, October 3, 1888, at the hour of three o'clock p.m., when Fellows and members will be elected, the hon. local secretaries' reports and correspondence will be considered, and other business transacted. After the meeting the Rook of Cashel (for centuries the residence of the Kings of Munster) will be visited, and, if time permits, the Hoar Abbey and St. Dominick's Priory will also be visited. In the evening there will be a meeting at eight o'clock, when a number of papers on archaeological subjects will be read.

**Church, Birkdale Common, Southport.** In a limited competition for a new church at Birkdale, the designs of Mr. J. Francis Doyle, of Liverpool, were selected by Mr. Ewan Christian, acting as assessor, and accepted by the building committee. The church will accommodate 600 worshippers.



## Illustrations.

## THE EQUESTRIAN TAVERN, BLACK-FRIARS-ROAD, S.E.

THESE premises are being built for Mr. W. Turner on the site of the old "Equestrian" Tavern, adjoining the Surrey Theatre, Blackfriars-road, and comprise extensive cellars in basement, bars and club-room on ground-floor, billiard-room, club-room, and residence on first and second floors, the third floor being arranged as a residential flat, which has been let, with offices on first floor, to the Hatters' Society, who for some years have had their headquarters at this house.

The front is carried out in red brick with stone dressings and granite pilasters on ground-floor, the ornamental frieze between the second and third floor windows being modelled in cement on a red back-ground; this, together with the other carving, having been executed by Mr. Gilbert Seale.

The whole of the partitions and fittings in the bar are in mahogany.

The works are being carried out by Messrs. Allen & Sons, of Kilburn, from the designs and under the superintendence of Mr. T. H. Smith, architect.

## THE CHURCH OF ST. NICHOLAS-AT-WADE, IN THANET.

ST. NICHOLAS-AT-WADE is situate in the north-east quarter of the Isle of Thanet, and, according to Hasted, derived its name from its position, — the Wading-place over the river Wantsum, near the bridge at Sarre.

The church is characteristic of and presents all the distinctive features peculiar to the churches in and near Thanet. Much Norman and Early English work is to be met with in them, the latter period generally in the chapels and chancel aisles, though the windows and other features are often later insertions.

Splendid examples of early work, having more or less the same character, are to be found in St. Clement, Sandwich, and at Minster, both typical churches. These remains are of very considerable interest, and their details well worthy the most careful study.

The Church of St. Nicholas originally was a Norman structure, but a portion of the south arcade, and a pier, with the original base and cushion-cap on the north side, are the only remains of this period.

It would seem that the aisles occupy the position of the Norman plan, a part of the original south aisle being thus retained. As at St. Mary, Sandwich, and at Worth, it is probable there was a Norman tower at the west end of this church.

The walls of the chancel, the chancel arch, and the north and south chapels, are Early English, but all the original windows have been removed, and those of a later period inserted. Under the east window of the north chapel is a spayed recess, indicating the position of the altar. A part of the north pier of the arch opening into the aisle, it may be noted, is built of tufa.

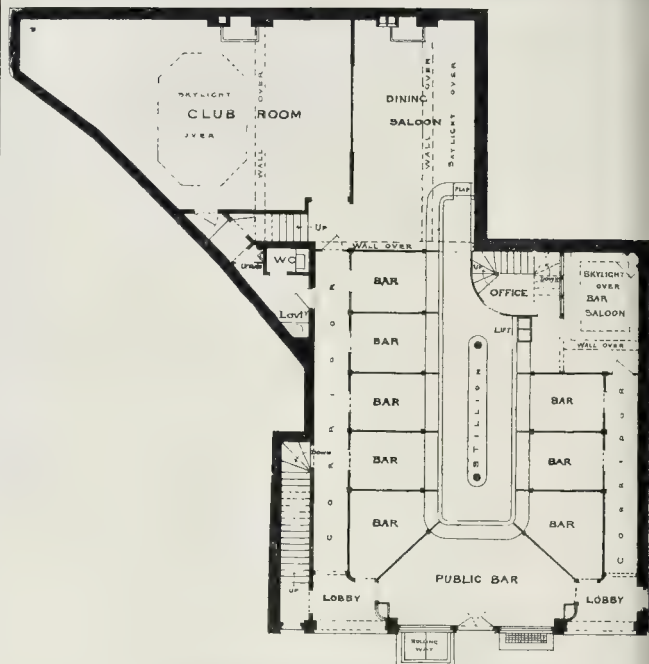
On the outside of the east wall of the South Chapel are indications of an early triplet window, and it is supposed that this was removed when a new window was built in, by the will of one John Andrews, of Thanet, in 1480, who devised six marks for this purpose, and ordered himself to be buried in the Chapel of St. Thomas the Martyr, on the south side. A perclose screen no doubt formerly occupied the arch into the chancel from this chapel.

It is supposed that over the rood loft, besides the image of Our Lord on the cross, were the images of St. Katherine, the Blessed Virgin Mary, and the Holy Trinity, altars and candles belonging to each. A part of the original nave roof still remains, and from it hangs a very fine candelabra, dated 1757.

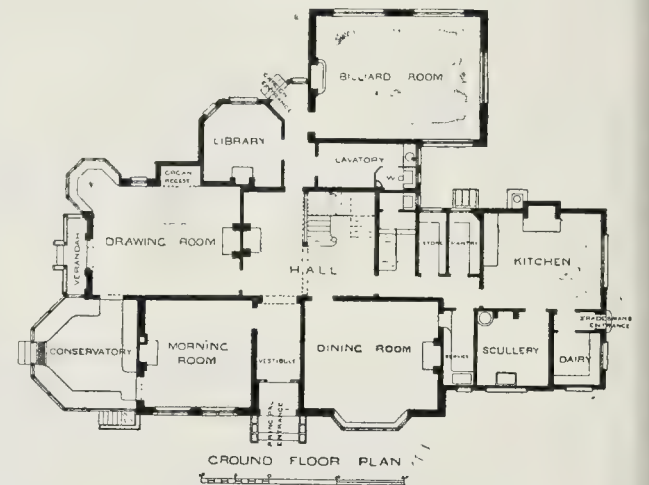
Decorated work may be seen in the south wall of the aisle, and the unusual way the wall breaks back, in order to meet the inner face of the tower wall (also of this period), were remarkable.

The fourth arch in the south and the whole of the north arcade, with the upper stages of the tower and the porch, are Perpendicular work.

Over the south porch is a parvise in very good condition, and retaining its original approach and fireplace. The tower, which was originally groined, is used as a baptistry.



*Equestrian Tavern, Blackfriars-road.—Plan.*



*House at Bromley, Kent. (See page 215.)*

St. Nicholas' Church was anciently a chapel of the Church of Reculver, and in the possession of the see of Canterbury, until it was united to the neighbouring church of All Saints, Sarre, and made parochial by Archbishop Winchelsea in A.D. 1298. Its fine tower, situate at the south-west angle of the church, is one of the noblest in Kent, and, built upon rising ground, forms a conspicuous landmark far over the Isle of Thanet.

There is a good brass in the floor of the north chapel (now called the Bridges' Chapel), and an inscription in old English characters below the figures states the memorial to be Valentyne Edvard, who died in 1559, and his two wives, Agnes and Joan.

"Here lyeth buried y<sup>e</sup> bodies of Valentyne Edvard gentylman who had too wyfes Agnes and Joan by Agnes he had iiiii sonnes and too daughters and also by Joan his second wyfe iii sonnes and vi

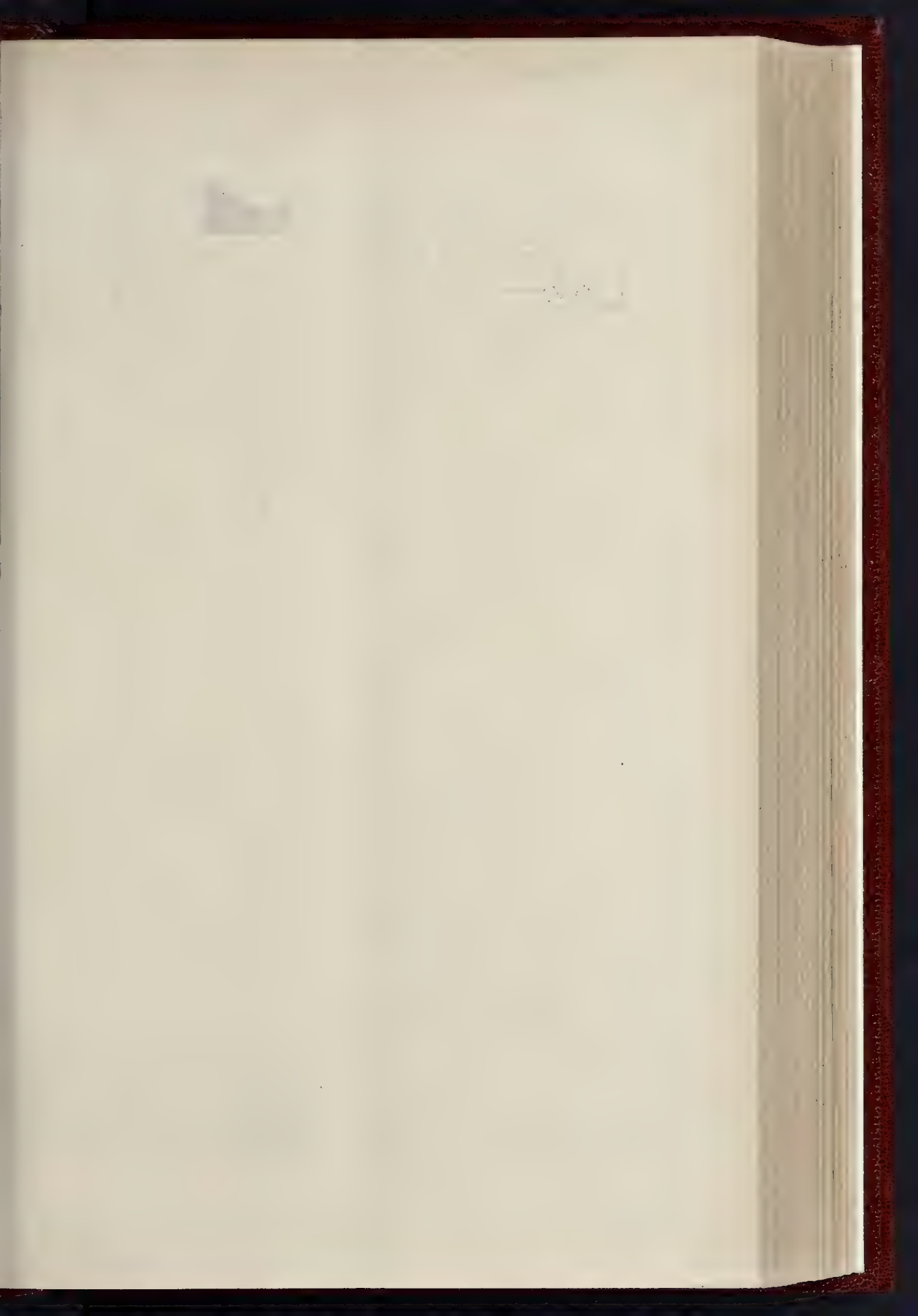
daughters which Valentyne decessed the xxv daye of February in the yere of o<sup>r</sup> Lorde God mcccclix after whose decess the ladye Joane maryede with Thomas Parramore and by him had a sonne and a daughter and the ladye decessed the ffith day of April in the yere of o<sup>r</sup> Lorde God mcccclxiii whose soules God hathe taken to his mercy."

The male figure is probably that of Valentyne Edvard, and the second of Thomas Parramore.

Undoubtedly the south arcade of nave is the most interesting part of the church, and, turning to the lithographed illustration, it will be seen that it consists of four bays. Its two eastern-most arches are equal in width and carried on Roman piers, while a striking feature is the very curious blending of Norman and Early English carving on the caps.

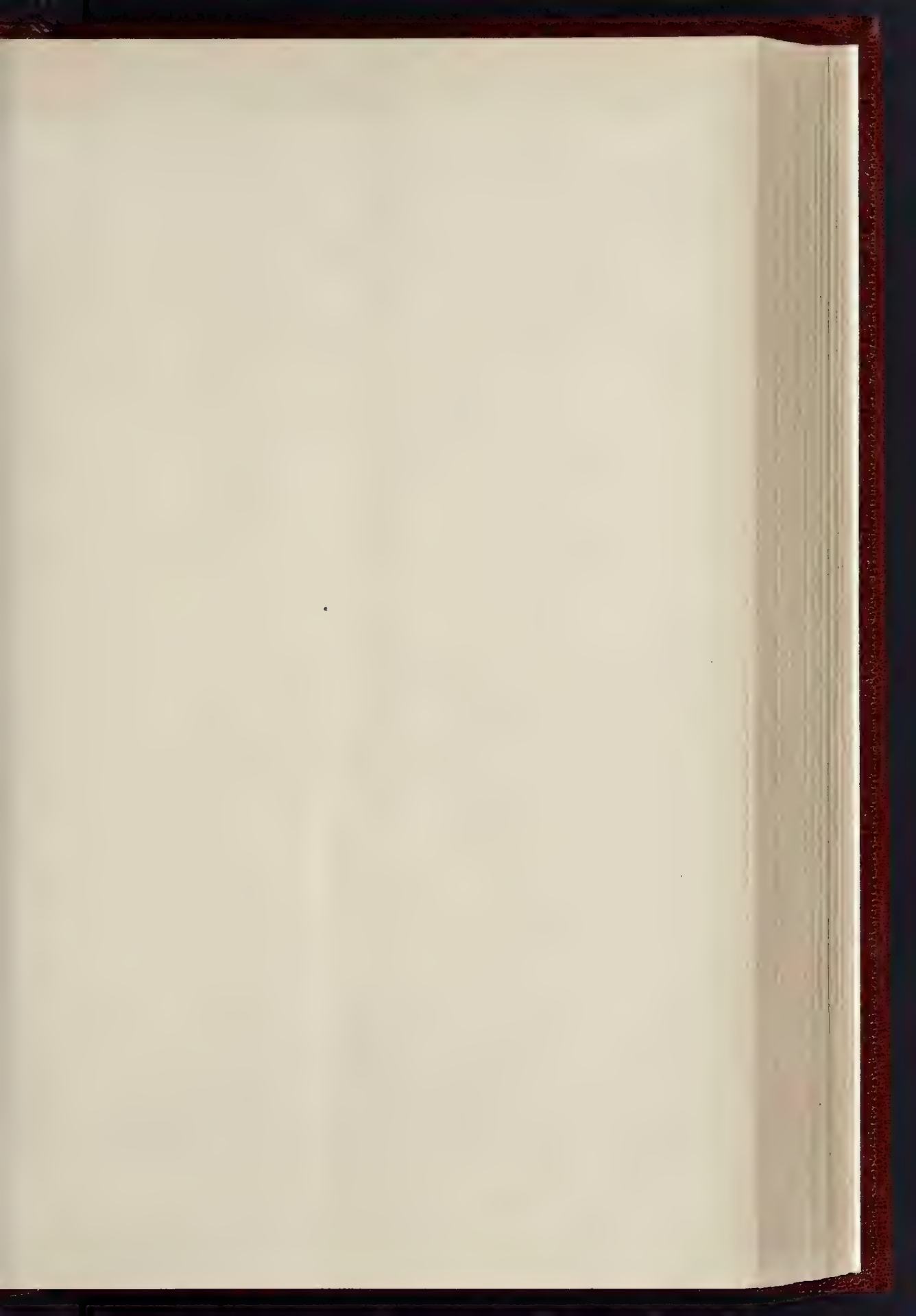
The first archmold is extremely beautiful, and seems almost unique. The third arch is Early English, and its simple and telling character









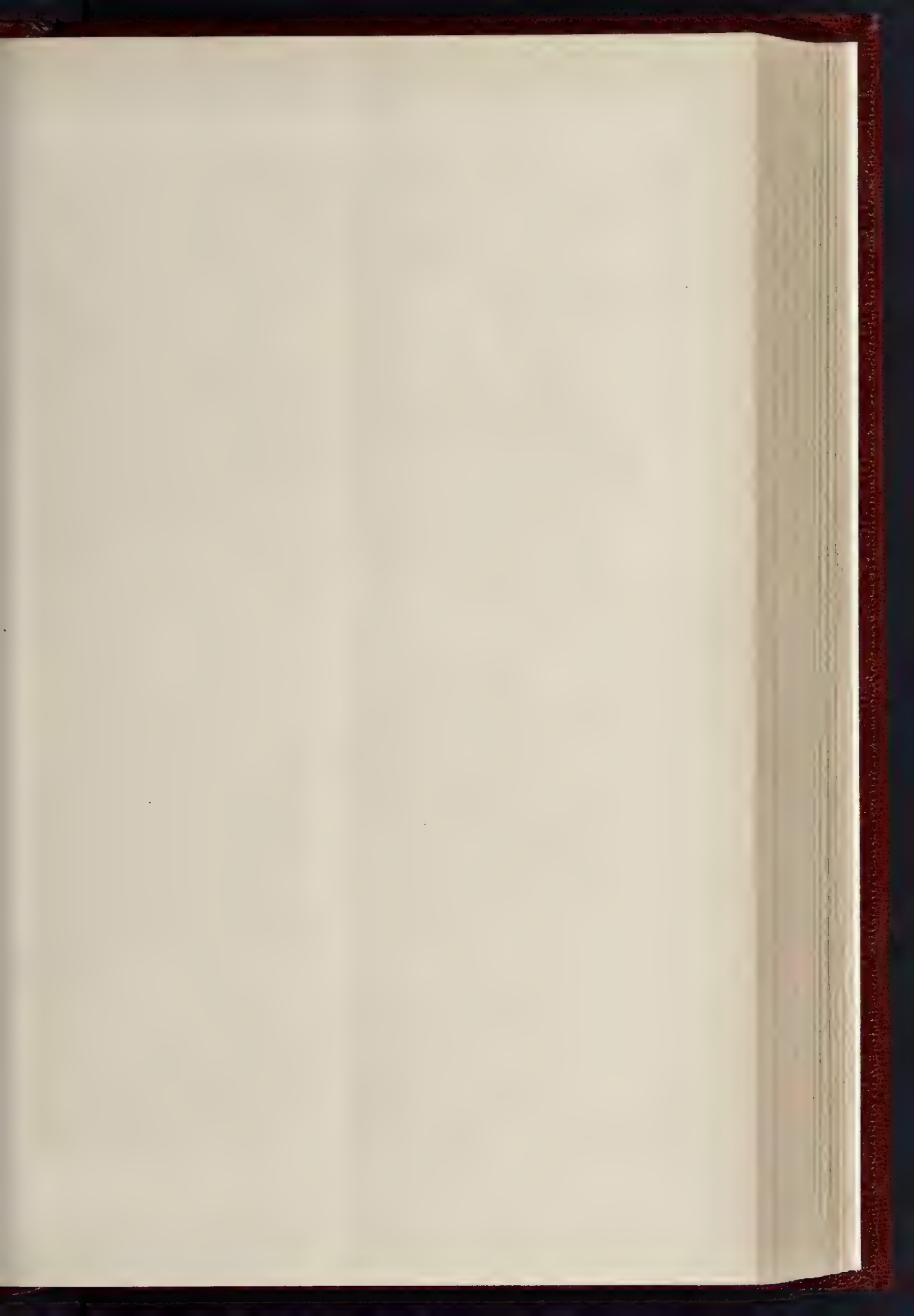


THE BUILDER, SEPTEMBER 22, 1868.

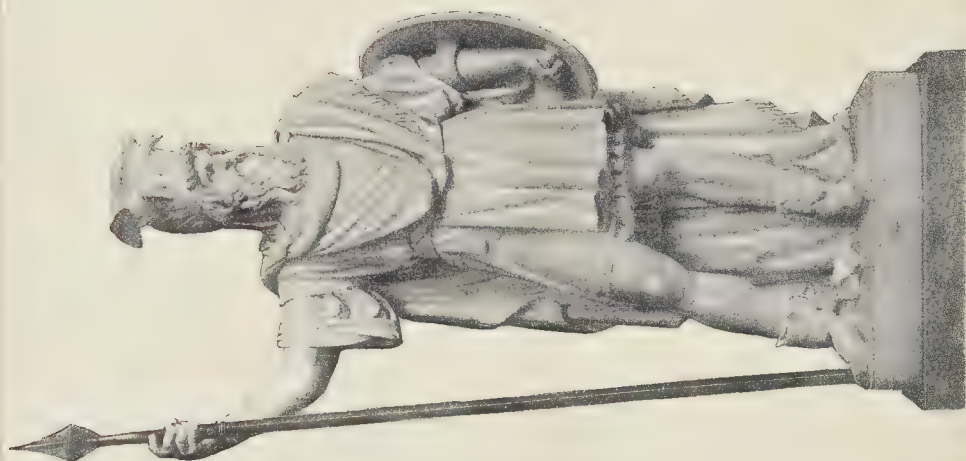


SOUTH TRANSEPT, ST. ALBAN'S CATHEDRAL.

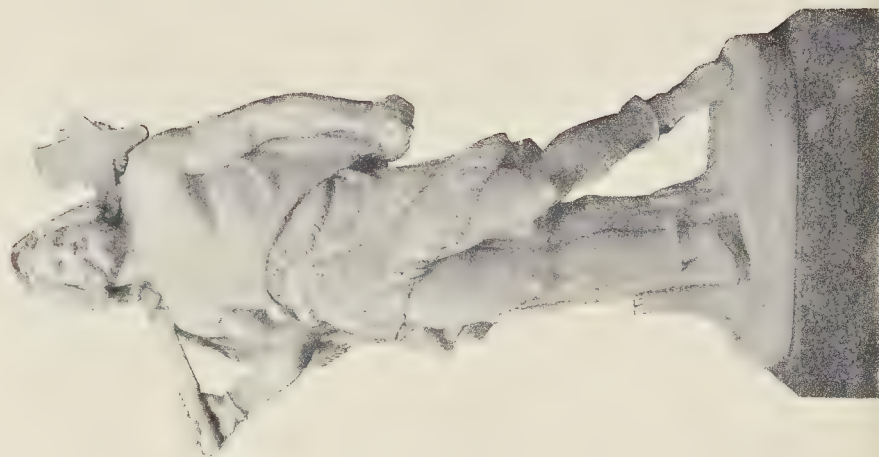




THE BUILDER, SEPTEMBER 22, 1888.



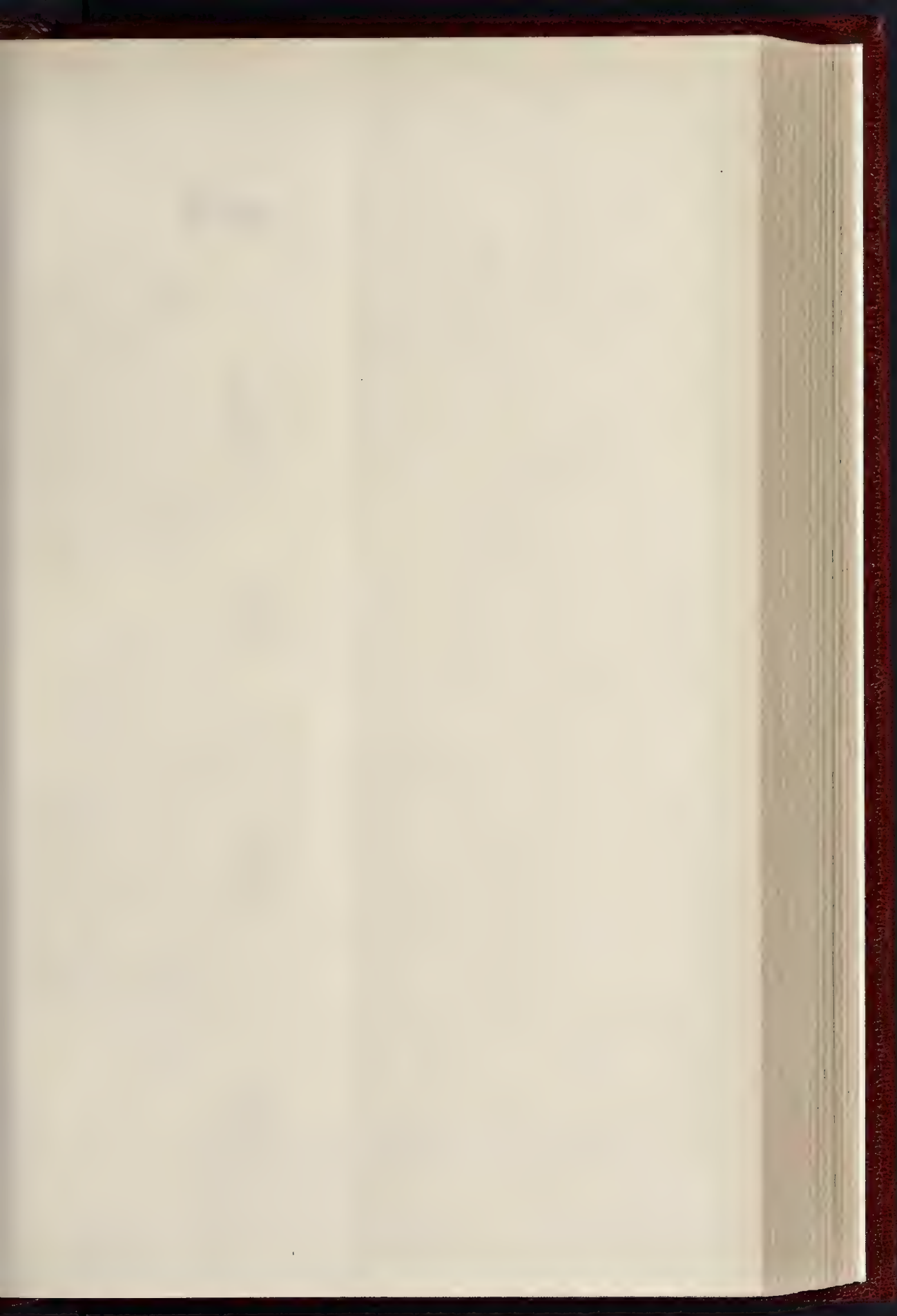
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3 MODNO AU HONNE, JNE DE LA FORM ET BEAU COUPE VOUSSE EN LA





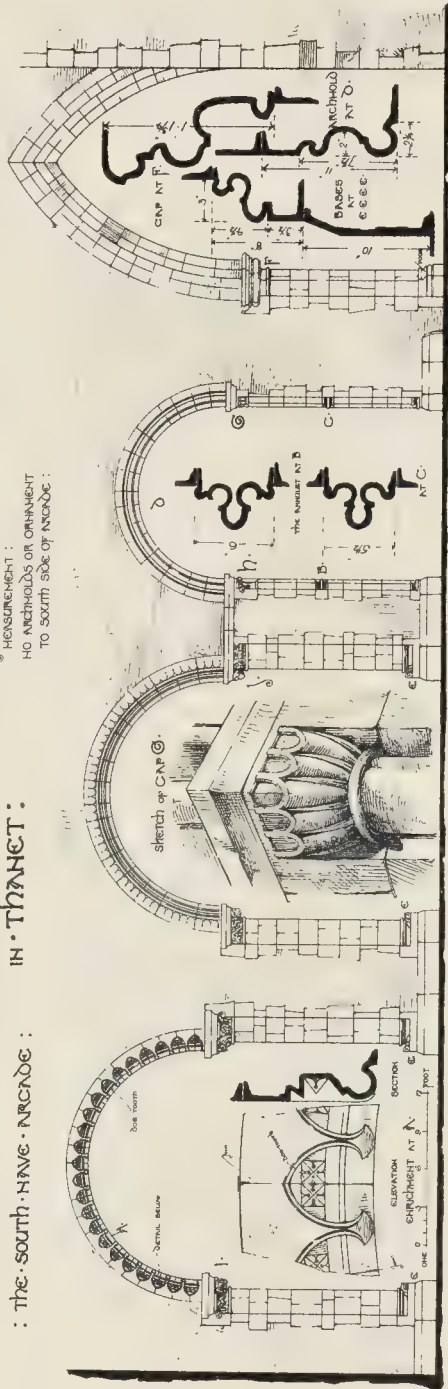
THE BUILDER, SEPTEMBER 22, 1888.

† the ch. of S. NICHOLAS. AT WADDE.

: the south nave arcade :

IN THANEET :

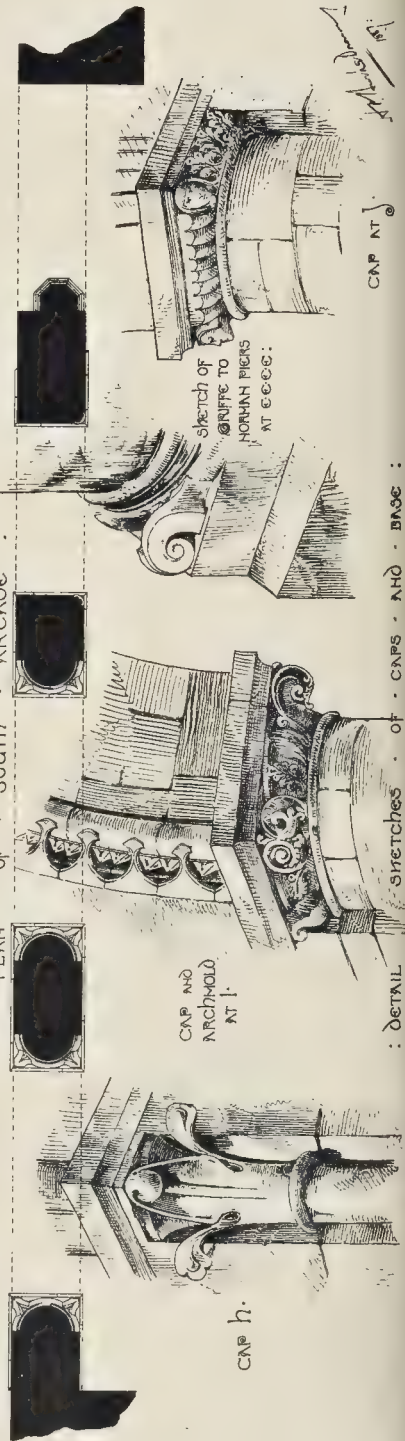
: NOTE :  
 DIMENSIONS FROM ACTUAL  
 MEASUREMENT :  
 HO ARCHHOLDS OR ORNAMENTS  
 TO SOUTH SIDE OF NAVE :



: ELEVATION OF ARCADE - LOOKING SOUTH :

PLAN OF SOUTH ARCADE :

SCALE OF FEET 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100





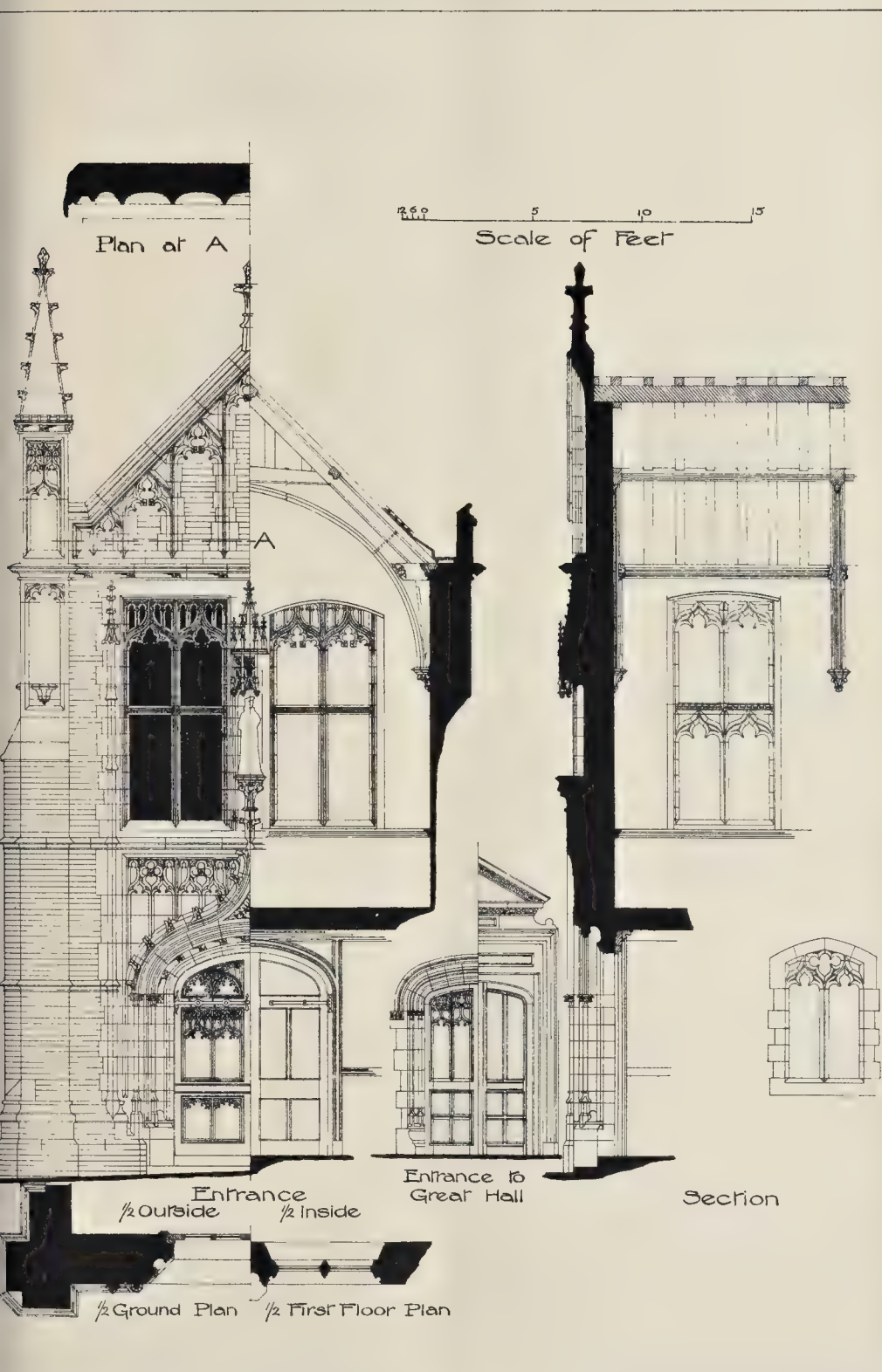
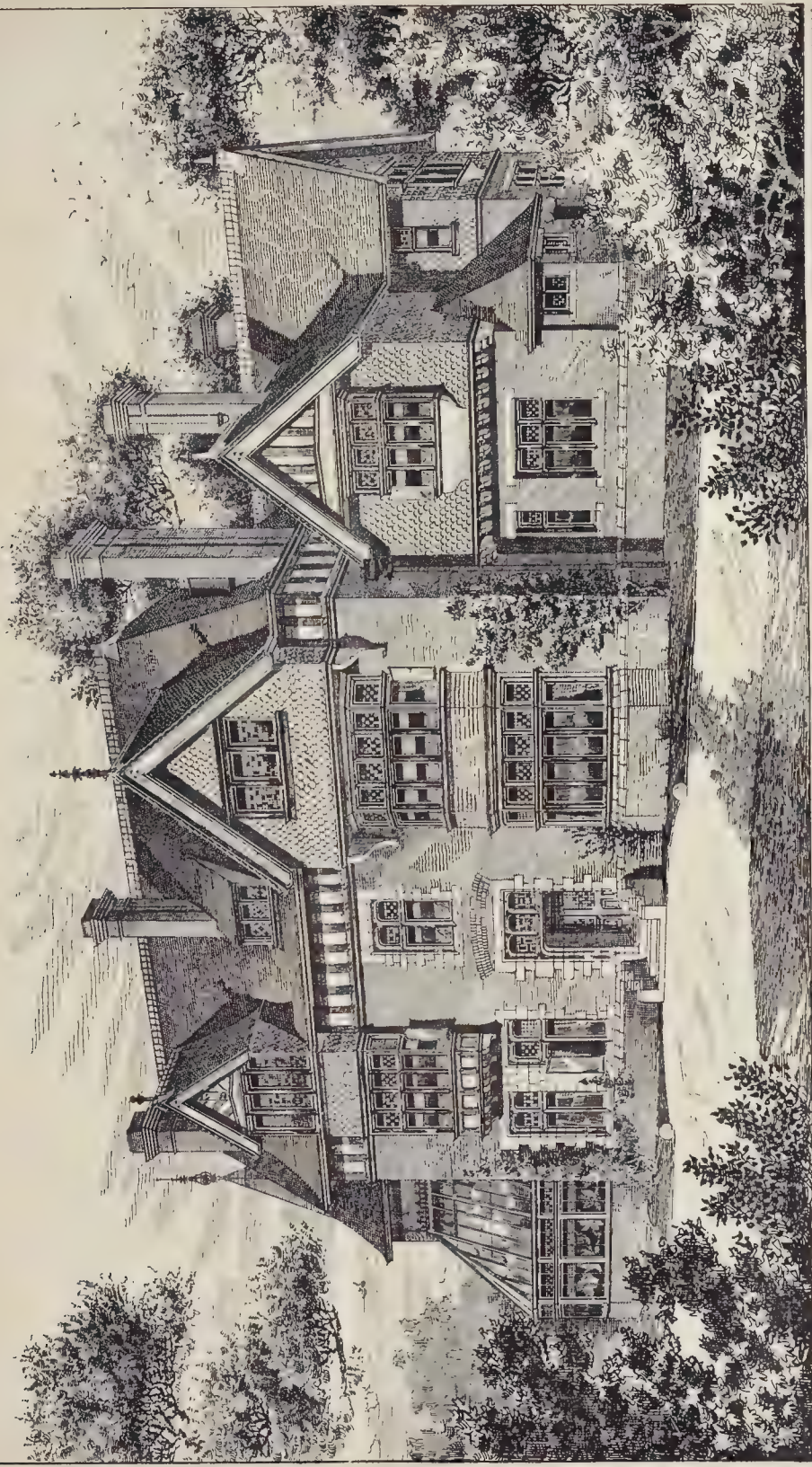


PHOTO LITHO, SPRAGUE & CO. 22 MARTIN LANE, LONDON, E.C.







HOUSE AT BROMLEY, KENT.—MR. H. PERCY MONKTON, F.R.I.B.A., ARCHITECT.





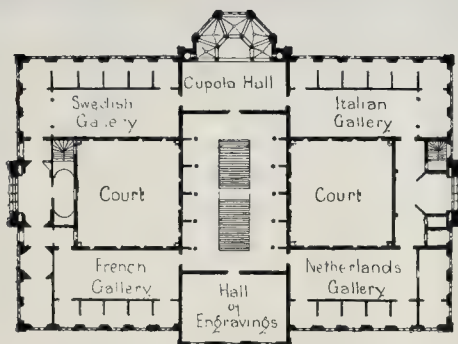


NATIONAL MUSEUM, STOCKHOLM.

The Phototype Co., 303, Strand, London.







National Museum, Stockholm.—Plan of principal floor.

irely accords with much of the work in the arches of Thanet.

The fourth arch, next the tower, is Perpendicular. It was most probably reconstructed in the upper stages of the tower were built, it is not nearly so true in style.

H. P. BURKE DOWNING.

#### ENTRANCE PORCH, SION COLLEGE.

We give an illustration of another portion of a building, reproduced from a portion of the architect's working drawings. We gave an illustration of the details of the principal front in *The Builder* for May 5 of this year, and a description of the building in the *Builder* of March 6, 1886.

The architect is Mr. A. W. Blomfield, A.R.A.

#### HOUSE AT BROMLEY, KENT.

THIS residence, which is now in course of erection for Mr. A. Gurney Smith, of Bromley, is situated on an elevated and well-timbered site, the Tootswood-road, and commands fine views of the surrounding country.

The materials used for the construction of the house are dark red bricks and Bath stone, the hanging tiles being bright red, and the roofs covered with dark purple Ayley tiles, with bright red ridge tiles and leaded finials.

The walls of second-floor are of brickwork, and externally with stout-framed timbers, and plastered between same with cement, and finished with rough-cast shingle.

All the constructional timbers showing externally, including barge boards, will be painted black, and the windows and sashes cream white.

The works, which also include extensive plumbing and an entrance lodge, are being carried out by Mr. Ernest Roome, builder, of Chelmsford, under the superintendence of the architect, Mr. H. Percy Monckton.

#### THE NATIONAL MUSEUM, STOCKHOLM.

THIS is not a new building, having been in existence for some time; but, as one of the largest and most important public buildings in Sweden, on which no expense and pains were spared, an illustration of it may be of interest to English readers. The building was erected on the designs of Stüler, at a cost of considerably over £100,000. A plan of the principal floor is subjoined.

In another plate we give an illustration of the statues of Odin and Thor, by Fogelberg, which are among the prominent sculptural decorations of the interior.

#### ST. ALBANS ABBEY: SOUTH TRANSEPT.

THIS illustration, reproduced from a photograph, represents the new façade of the south transept at St. Albans, supposed to be designed by Lord Grimthorpe, or for which, at all events, he is directly or indirectly responsible. For further remarks on it, and our reasons for illustrating it, the reader is referred to the first issue in the present number.

#### MEMORANDA FROM THE BRITISH ASSOCIATION MEETING.

WE put on record here some of the information or suggestions brought forward in papers read at the British Association meeting in regard to the class of subjects which are of special interest to our readers. The reports are chiefly taken from those given in the columns of the *Times*.

##### "MECHANICAL PATHOLOGY CONSIDERED IN ITS RELATION TO BRIDGE DESIGN."

This was the title of a paper by Mr. G. H. Thomson, read for the author by Mr. B. Baker in Section G. (Mechanical Science). After pointing out the applicability of the ordinary terms of medical science in the consideration of mechanical problems, the author asked, How many railway bridges are structurally competent to perform the work for which they were erected? How many are being taxed mechanically beyond the limit ever intended? And how many are able to withstand the sometimes rough usage (as in the case of collisions) incidental to railroad operations? A railway bridge was ordinarily constructed upon the assumption that all the conditions governing its use and life would always remain favourable, and the non-recognition of the fact that an unfavourable combination of circumstances might occur was responsible for many of the deficiencies that occurred in practice. No fewer than 251 truss railway-bridges had failed in the United States and Canada during the ten years ending December, 1887, from preventable causes such as were alluded to, involving in each case the wreck wholly or partially of a train. The author investigated the causes of these several accidents under different headings. He discussed successively broken axles and wheels, increase of tonnage, power, and speed. He doubted the utility of laboratory tests as a means of affording thoroughly reliable information in regard to broken axles, and pointed out that whereas the earliest engine used in America only weighed 0.875 ton per wheel, those now in use weighed 8 tons and upwards. Since 1874 the speed of freight trains on the New York Central had increased from 15 to 25 miles per hour, and passenger trains at times attained a maximum speed of no less than 74 miles an hour. The author then discussed certain experiments he had made with a view to ascertain the strains that occurred in various types of bridge when loads passed over them, and proceeded to describe an extensive series of photographs illustrative of bridge accidents, which were exhibited to the meeting. In concluding he strongly advocated the use of riveted lattice bridges instead of pin-connected trusses for railway service up to spans of 250 ft., and gave numerous reasons for preferring them, as well as conditions to be observed in their construction.

##### UNDERGROUND WATERS.

Mr. J. Bailey Denton read a paper on "The Replenishment of the Underground Waters of the Permeable Formations of England," in which he said: The author, having long advocated with the late Sir John Rennie and others the storage of the surplus rainfall in reservoirs or lakes to be constructed in the higher tributary valleys of our river systems to maintain them in full service, in-

vites attention to the capabilities existing of replenishing at the same time the subterranean supplies of the water-bearing strata by shafts to be sunk down to the line of their saturation. Of the 27 inches forming the mean average annual rainfall, about two-thirds, or 18 inches, are evaporated from the surface, while of the remaining third 4 inches serve to maintain the river system, and 5 inches pass away as floods and freshets. Instances are numerous in which the year's rainfall exceeds 30 inches, while they are very few in which it is less than 20 inches—about three times in twenty years. As the amount of evaporation is nearly a constant figure, and the quantity required to maintain effectually the river system necessarily remains the same under all conditions, the amount of flood or excess water greatly varies. It is sometimes double the average. On the few occasions when the rainfall does not reach 20 inches it is insufficient to satisfy the demands of the river system, and then the river becomes a borrower from the stored supply of the subterranean reservoirs. On such occasions the quantity of water flowing down the Thames to Kingston has been so reduced as not to reach 300 million gallons in 24 hours. The importance and bearing of this fact upon the proposal to replenish the subterranean supply will be appreciated when it is pointed out that the quantity of water supplied daily to the metropolis by the water companies has already exceeded 150 million gallons. Of these 150 millions the River Thames contributes 50 per cent., or 75 millions, which is a quarter of the quantity flowing past Kingston. The Lea furnishes 35 per cent., and deep chalk wells the remainder, or 12 per cent. The quality of deep-well waters has become of late years more and more approved. Dr. Edward Frankland, in his classification of potable waters, places deep-well waters only second to springs issuing from the outcrops of the same formations. To make good the loss of this superior water, the author proposes that whenever the water in the river rises above a certain datum height recognised as the gauge of its full service, the excess shall be diverted out of the river course on to filter-beds formed near at hand. The outlet from these filter-beds would be steined shafts or sumps sunk down to the water level beneath, and into them the filtered water would pass after it was freed from flocculent matter. The steined shafts would be made water-tight, and sealed against all surface contamination.

##### LIGHT OR ROAD RAILWAYS.

"A Few Arguments in Favour of Light or Road Railways" was the title of a paper read by Mr. T. S. Sellon before Section G (Mechanical Science). The author's object was to demonstrate that there was no reason why the present tramway system, familiar in most of our principal towns, could not be made (with some modifications) of exceptional value as feeders to the trunk lines, and as a means of transit for every description of goods and merchandise as well as passengers. By utilising the sometimes considerable waste, so often met with along the side of our country roads, cheap and efficient feeders could be constructed, thereby saving the cost of land purchase, or the heavy cost of maintenance if constructed on the road. A line which had been constructed on this principle, and which had been working for the last eighteen months, was mentioned, as proving how increased facilities made increased traffic. It carried the entire population of the whole district once a week, besides dealing with the whole of the cartage and delivery of goods to and from the London and North-Western Railway, with which the line was connected, as well as all the parcels and mails. Besides the advantages proved by the large patronage it received, the property in the district since its opening had risen 20 per cent. in value, and houses which had long been in want of tenants were now all occupied. As the object of this class of railway was to carry heavy goods and other merchandise that would otherwise be drawn along the road, it was clear that there must be a great saving in the wear and tear of the same, as well as a material relief to the road rates, which, in some country districts, were a great burden. Being a tramway, the working expenses, as compared with railways, were very small, owing to the absence of stations and station officials, signals, and telegraph. The author was strongly against the construction of this class of light railway to any other gauge but that of the line it fed, as he affirmed that the plea of economy could not in that case be maintained, and that one of



the chief causes of the failure of the Irish Tramway Act, 1883, was the fact that the gauge was fixed at 3 ft., the fallacy of which had been demonstrated by the report of the late Royal Commission on Irish Public Works. He also pointed out the great necessity there was for the reform of Private Bill legislation, there being far too much expense in the introduction of a scheme,—*i.e.*, prior to consideration; a mutilated Bill being often accepted by the promoters in consideration of the money already expended. In these days of progress landowners were urged to thoroughly examine the merits of a scheme before they threw away their money in opposition, as by arrangement with promoters all their objections might often be overcome. By a comparison between the ordinary service of a branch line and the ordinary service of a light railway, it was demonstrated by the actual returns of the latter that it was to the interest of all railway managers and railway shareholders to give every facility for the construction of these feeders, which must largely increase the value of their properties.

Mr. Shelford thought the great difficulty in the way of light railways in this country was the want of legislation. At this moment, farmers were unable to obtain those light railways because Parliament had not afforded the legislation in order to accommodate them. There were no means available at present in this country of obtaining power to make a really light railway. In our colonies, however, and elsewhere, there was a wide field for those lines of railway.

Mr. Wheeler bore testimony to the advantage which the farmers of this country would derive in the conveyance of produce were light railways constructed. It was desirable, however, that there should be no break of gauge between the main lines and the subsidiary ones. Holland and Belgium were able to send cheap vegetables into this country, owing to the traffic facilities which they enjoyed.

Another speaker thought that an increase in the small branch railways would have an enormous effect in preventing aggregation of the working population.

#### THE ELECTRICAL TRANSMISSION OF POWER.

This was the subject of one of the evening discourses delivered at Bath during the recent meeting of the British Association. The discourse was very fully illustrated by apparatus and by views thrown on a large screen.

The lecturer, Professor Ayrton, F.R.S., said,—What is power, and why should we wish to transmit it? Power has one very definite meaning in science and several rather vague meanings in practice. We speak of a powerful athlete, the power of the law, we sing of the power of love, and we say that knowledge is power. But by "power" an engineer understands the rate of doing work. When you walk upstairs you exert power, only perhaps the one-twentieth of a horse when you go up slowly talking to other people. But when you run upstairs because you have forgotten something that you intended to bring down, then your exertions represent perhaps the one-tenth of a horse-power. You only get to the top of the stairs in either case, but the breathless sensation of running fast upstairs tells you that the more quickly you go the harder you are working. A person exercises power in the engineer's sense when he exerts himself physically, and the greater the exertion the greater the power. Probably the most familiar example of exerting power at a distance, that is of transmitting power, is pulling a handle and ringing a bell in another room. It was not until just 100 years ago that it dawned on people that if one person, A, wanted to attract the attention of another person, B, the place where the bell ought to sound was where B was and not where A was. Indeed, in many English villages down to the present day the knocker principle of attracting attention is alone resorted to, with the result which you may remember happened when Mr. Pickwick was staying in Bath at lodgings in the Royal Crescent. But if some houses can still dispense with mechanical or other methods of transmitting power even to ring bells, factories cannot. The looms, the lathes, or whatever the machinery used in the factory may be, must either be worked by hand or foot in the old style, or must be connected with the steam, gas, or water-engine in the new. In America there are 6,000 electro-motors working machinery; in Great Britain hardly 100. The holiday tourist, when admiring the splashing water dashing over the stones, hardly

realises that the money loss is as if the foam were composed of flakes of silver. The newspapers of last week contained a long account of the spiral electric mountain railway that has just been opened to carry people up the Burgenstock, near Lucerne, and worked by the River Aar, three miles away, so that we see that electric traction worked by distant water-power is extending. But splendid as are these most successful uses of water-power to actuate distant electro-motors, it is but a stray stream here and there that has yet been utilised, and countless wealth is still being squandered in all the torments all over the world. A general supply of power to workshops is to the manufacturer what a general supply of light or to the householder; it is all part of the steady advance of civilisation that leads the man of to-day to go to the tailor, the shoemaker, the baker, the butcher, instead of manufacturing his own moccasins and lassoing a buffalo for dinner. And in case any of you may be inclined to think that we have gone far enough in these new-fangled notions,—and we are all, perhaps, prone to fall into this mistake as we grow older,—let me remind you that, while each age regards with justifiable pride the superiority of its ways to those of its ancestors, that very age will appear but semi-civilised to its great-grandchildren. Let us accept as an undoubted fact that a general distribution of power would enable the man of civilised life to be better satisfied, and, therefore, would greatly benefit humanity.

There are four methods of transmitting power to a distance:—1. By moving a rope. 2. By air compressed or rarified at one end of a pipe operating an air-motor at the other end. 3. By water forced through a pipe working a water-motor. 4. By electricity. We have an example of the transmission of power through a short distance by an endless belt or rope in the machines geared together by belts on this platform, and in the rotary hair-brushes at Mr. Hatt's establishment in the Corridor Bath. At Schaffhausen, and elsewhere in Switzerland, the principle is employed on a large scale. Spain and other countries use it in connexion with the mining operations, and lastly wire ropes replace horses on many hilly tramways. For short distances of a mile or so there is no system of transmitting power in a straight line along the open country so cheap to erect and so economical of power as a rapidly-moving endless rope; but the other systems give much greater facilities for distributing the power along the line of route, are much less noisy, and far surpass wire-rope transmission in economy when the rope must move somewhat slowly, as in tramway traction, or when the distance is considerable over which the power is transmitted, or when the line of route has many bends. The electric transmission of power even now bids fair to surpass all other methods in—1. Economy in consumption of fuel. 2. More perfect control over each individual machine. 3. Ability to bring the tool to the work instead of the work to the tool. 4. Greater cleanliness,—no small benefit in this dirty, smoky age. 5. And lastly, there is still one more advantage possessed by this electric method of transmitting power that no other method can lay claim to—the power which during the day-time may be mainly used for driving machinery can, in the easiest possible way, be used during the night for giving light.

Our knowledge of electrical action in this respect resembles our knowledge of gravitation action. The only thing quite certain about the reason why a body falls to the ground is that we do not know it; and yet astronomical phenomena can be predicted with marvellous accuracy. The power of producing an action at a distance of many yards, or it may be many miles, by the aid of electricity without the visible motion of any substance in the intervening space is by no means new. It is the essence of the electric telegraph, and electric transmission of power was employed by Gauss and Weber when they sent the first telegraph message. But until about ten years ago the facility that electricity gave for producing signals almost instantaneously at a great distance was the main thing thought of. The electric power consumed for sending the telegraph messages was so small, the amount of power lost *en route* comparatively so valueless, that the telegraph engineer had no need to trouble himself with those considerations that govern us to-day when we are transmitting power large enough to work a factory or an electric tramway. Although there are as many as 22,560 galvanic cells at the Central Telegraph

Office, London, which cost some thousands annually to keep in order, what is that compared with the salaries of all the 3,089 superintendents, assistants, telegraph clerks, messengers, and the maintenance of the 1,150 telegraph lines that start from the central office? Until 1870 the pump most generally employed for pumping up electricity and giving it pressure was the galvanic battery, scientifically an extremely efficient converter of the energy in fuel into electric energy; but, unfortunately, the only fuel a battery will burn is so expensive. A very perfect fireplace in which there was very complete combustion and very little loss of heat, but which had the misfortune that it would only burn the very best wax candles, would be analogous with a battery. Suppose, however, a process be devised by means of which burnt zinc can be unburnt with an expenditure comparable with the burning of the same weight of coal, then it might be that, although coal would still form the basis of our supply of energy, the consumption of zinc in batteries might be an important intermediary in transforming the energy of coal economically into mechanical energy. While, then, some experimenters are aiming at possibly increasing the working power of a ton of coal to eight times its present value by earnestly seeking for a method of converting the energy it contains directly into electric energy without the intervention of a wasteful heat engine, it should not be forgotten that in the cheap unburning of oxidised metal may lie another solution. The solution of this latter problem is quite consistent with the principles of the conservation and dissipation of energy, since the heat required to theoretically unburn 1 lb. of zinc is only one-seventh of that given out by the burning of 1 lb. of coal. A very great improvement in electro-motors was made by Pacinotti in 1860, but, although his new form of electro-motor was described in 1864, it attracted but little attention, probably because any form of electro-motor, no matter how perfect, was commercially almost useless until some much more economical method of producing electric currents had been devised than the consumption of zinc and acids. A point to consider is the loss of power on the road between the dynamo at the one end and the motor at the other. This problem was, perhaps, seriously attacked for the first time in the discussion of a paper read by Messrs. Higgs and Brittle at the Institution of Civil Engineers in 1878, and that problem was considered in some detail theoretically and experimentally at the lecture I gave during the meeting of the British Association in Sheffield in the following year. It was then shown that, since the power developed by the generator and motor depended on the product of the current into the electric pressure, while the loss when power was transmitted through a given wire depended on the square of the current and was independent of the electric pressure, the economical transmission of power by electricity on a large scale depended on the use of a very large electric pressure and a small current, just as the economical transmission of much power by water depended on the use of a very large water pressure and a small flow of water. At that time it was not thought possible to construct a small dynamo to develop a very large electric pressure, or potential difference, as it is technically called, and, therefore, it was proposed to join up many dynamos in series at the one end and many lamps or electro-motors in series at the other, and to transmit the power by a very small current, which passed through all the dynamos and all the lamps in succession, one after the other. We laugh a good deal at the rough and ready manner adopted on the other side of the Atlantic. The Americans, no doubt, are very ignorant of the difficulties that properly-minded people would meet with, but it is a blissful ignorance where it is folly to be wise. Every English electrician who has travelled in America comes back fully impressed with their enterprise and their happy-go-lucky success. They have twenty-two electric tramways, carrying some 4,000,000 passengers annually, to our four electric tramways at Portsmouth, Blackpool, Brighton, and Bessbrook. Why, New York City alone, Mr. Beckenham tells me, possesses 300 miles of ordinary tramway track, and Philadelphia City 430 miles; so that there is more tramway line in these two cities than in the whole of the United Kingdom put together. But it is possible to use a very large potential difference between the main wires by means of which the electric power is economically conveyed a considerable distance



and transformed into a very small potential difference in the houses where it is utilised. The vast district in London, extending from Regent's Park on the north to the Thames on the south, from the Law Courts on the east to Hyde Park on the west, has over 20,000 incandescent lamps scattered over it, all worked from the Grosvenor Gallery in Bond-street by means of alternate current transformers, which convert the 2,000 volts maintained between the street-mains into 100 volts in the houses, and the London Electric Supply Company have arranged for a vast extension of this system to be worked from Deptford. In America alternate current transformers are, due to the remarkable enterprise of Mr. Westinghouse, used in light 120,000 incandescent lamps in sixty-three towns. In fact, the electric lighting of a whole town from a central station begins to excite less astonishment than the electric lighting of a single house did ten years ago. The efficiency of a well-made alternate current transformer is very high, being no less than 96·2 per cent. When the transformer is doing its full work, it draws 89·5 when it is doing one quarter of its full work, according to the experiments made by Mr. students. It certainly does seem most remarkable, and it reflects the highest praise on the constructors of electrical machinery, that motor power can be converted into electrical power, electrical power at low pressure into electrical power at high pressure, or electrical power at high pressure into electrical power at low pressure, or, lastly, electrical power into motor power; in each case with an efficiency of 94 per cent. As a further illustration of the commercial importance of this electrical transformation, I will show you some experiments on electric welding, one of the latest developments in electrical engineering. I will weld a bar of iron one square inch in section and require a gigantic current of some 13,000 amperes. To convey this current even a few yards would be attended with a great waste of power, consequently, while an enormous current passed through the iron to be welded, only a comparatively small current is transmitted along a circuit from the dynamo to the welding apparatus. During the last few months fierce has been the battle raging among the electricians, the war of being alternate current transformers *versus* accumulators, while the workers on, with that better view of the contest that they are proverbially said to possess, have decided that the battle is drawn one. Neither system is the better under all circumstances; if the district to be lighted be a very scattered one, use alternate current transformers by all means; but if the houses to be lighted are clustered together at a distance from the supply of power, then the spring property possessed by accumulators, which enables the supply of electric power to far exceed the capacity of the dynamos and engines in the busiest part of the twenty-four hours, will win the battle for accumulators. The direct current system of distribution such is furnished by accumulators has also the very great advantage that it lends itself to the use of the very efficient electro-motors which I have been using this evening. Alternate current motors do exist, but they are still in the experimental stage, and are not yet articles of commerce. I showed you a little while ago an electric fire. Was that a mere toy, or had it any commercial importance? To burn coal, to use dynamos, and to use the electric current to light your houses and your streets is clean and commercial; to use the current to warm your rooms, clean but wasteful, on account of the inefficiency of the steam-engine. But when the dynamos are turned by water power, which would otherwise be wasted, the electric current may be economically used, not merely to give light, but also to give heat. And when the electric transmission of power becomes still more perfect, as at present, even to burn coal at the pit's mouth, where it is worth 1s. a ton, may, in spite of the efficiency of the steam-engine, require only one-tenth, be the most economical of warming distant towns where coal could cost 20s. a ton. Think what that would mean—no smoke, no dust, a reform effected commercially which the laws of the land and smoke prevention are powerless to bring about; a reform effected without the intervention of a State, and therefore dear to the hearts of Englishmen. But of all the many commercial uses to which the electric current may be put, probably, after the electric light, electric traction has most public interest. Now, while it costs 3d. or 7d. to run a car one mile with

horses, it only costs 3d. or 4d. to propel it electrically. Indeed, from the very minute details that have recently been published of the four months' expenses of electrically propelling thirty cars at seven and a half miles an hour along twelve miles of tramway line in Richmond, Virginia, it would appear that the total cost, inclusive of coal, oil, water, engineers, firemen, electricians, mechanics, dynamo and motor repairers, inspectors, linemen, cleaners, lighting, depreciation on engine, boiler, cars, dynamos, and line work has been only 1½d. per car per mile. The "series" system of propelling electric trains was, oddly enough, entirely ignored in all the discussions that have taken place this year at the Institution of Civil Engineers and at the Institution of Mechanical Engineers regarding the relative cost of working tramways by horses, by a moving rope, and by electricity, and yet this series system is actually at work in America. There is a series electric tramway in Denver, Colorado, and a series electric tramway of twelve miles long, on which forty cars are to be run, is in course of construction in Columbus, Ohio. The first track on which electric trains were run in series was the experimental "Telfer line," erected at Glynde in 1883, under the superintendence of the late Professor Fleeming Jenkin, Professor Perry, and myself, for the automatic electric transport of goods. The Series Electrical Traction Syndicate are now developing our idea, but it has received its greater development in the States, where the Americans are employing it instead of spending time proving, *a priori*, that the automatic contact arrangements could never work. In addition to the small waste of power, and consequent diminished cost of constructing the conductors that lead the current into and out of the passing trains, the series system has another very marked advantage. Some years ago we pointed out that when an electric train was running down hill, or when it was desired to stop the train, there was no necessity to apply a brake and waste the energy of the moving train in friction, because the electric motor could, by turning a handle, be converted into a dynamo, and the train could be slowed or stopped by its energy being given up to all the other trains running on the same railway, so that the trains going down hill helped the trains going up hill—the stopping trains helped the running trains. At that time we suggested detailed methods for carrying out this economical mutual aid arrangement, whether the trains were running on the parallel or on the series system. But there is this difference—that, whereas on the parallel system it is only when a train is running fairly fast that it can help other trains, the series system has the advantage that, when a motor is temporarily converted into a dynamo by the reversal of the connexions of its stationary magnet, the slowing train can help all the other trains, even to the very last rotation of its wheels. Brakes that save the power instead of wasting it are of purely English extraction, but their conception has recently come across the Atlantic with such a strong Yankee accent that it might pass for having been born and bred in the States. Economy is one feature that gives electric traction their right to claim your attention, safety is another. This model telfer line, worked on the "post-head contact" system, is so arranged that no two trains ever run into one another, for in addition to each of the three trains being provided with an automatic governor which cuts off electric power from a train when that train is going too fast, the line is divided into five sections connected together electrically in such a way that as long as a train is on any section A, no power is provided to the section B behind, so that if a train comes into section B it cannot move on as long as the train in front is on section A. (Three trains were shown running on a model telfer line with four automatic locks.) Whenever a train—it may be even a runaway electric locomotive—enters a blocked section, it finds all motive power withdrawn from it quite independently of the action of signalmen, guard, or engine-driver, even if either of the latter two men accompany the train, which they do not in the case of telferage; no fog, nor colour-blindness, nor different codes of signals on different lines, nor mistakes arising from the exhausted nervous condition of overworked signalmen can with our system produce a collision. Human fallibility, in fact, is eliminated. It may be interesting to mention that the last difficulty in telferage, which consisted in getting a proper adhesion between the driving-wheels of

the locomotive and the wire rope, has now been overcome. The history of telfer locomotives is the history of steam locomotives over again, except that we never tried to fit the electric locomotives with legs, as was proposed in the earlier days for steam locomotives. It is a tedious, discouraging history; but it is so easy to be wise when criticising the past, so difficult to be wise when prospecting the future. Gripping wheels of all kinds, even the indiarubber tires used for the last three years, have all been abandoned in favour of simple, slightly loose, cheap iron tires, which wear for a very long and give a very perfect grip when the bar supporting the electro-motor is so rivetted, pendulum-wise, to the framework of the locomotive that the weight of the motor no longer makes the locomotive jump in passing the posts, as it did until quite recently. After several years of experimenting we have in telferage, I venture to think, at last a perfectly trustworthy and at the same time a most economical method of utilising distant stream or water power to automatically transport our goods, and in time it may even be our people, over hills and valleys without roads or bridges, and without interfering with the crops or the cattle, or the uses to which the land may be put over which the telfer trains pursue their snake-like way; we have, in fact, the luxury of ballooning without its dangers.

#### LONDON SCHOOL-BOARD COMMITTEE.

SIR.—I cannot see an architect under whom I served in 1874 assailed without joining the fray.

If ever a captain sailed with a scratch crew, Mr. Robson did at that date. He had only two competent assistants, viz., Mr. Bailey and Mr. Macfarlane, and the latter's duties were secretarial, not architectural.

The story of the twin staircase referred to in your article in last number, is a very old one. It used to be related at every meeting when the clerks of works met at the Bank of England monthly to receive their pay. I have heard it dozens of times at that date, with variations, but then it was a clerk of works at a school at Clapham that figured as the hero, and Mr. Robson was stated to have called him a fool to his face, and I always said "serve him right."

I am speaking from memory of drawings that passed through my hands fifteen years ago, and am subject to correction, but these stairs were a clever attempt to utilise space, getting two stairs in the superficial area of one, and a mezzanine floor over a coal-place to be used as a lavatory. The height from floor to ceiling being only 15 ft., it is clear that only 6 ft. 6 in. from the top of the lower step to the soffit of the one over could be obtained. Only eighth-scale drawings were supplied, and any clerk of works worth his salt would have done as I did,—make an inch-scale drawing, as very careful working was required to get the head-room regular.

A word in defence of the clerks of works. The Board's system of giving monthly payments on account to builders enabled a very impecunious lot to get schools to build. The clerks of works were given several schools, and they could not watch everything. As an illustration, a builder of one of the fire schools given me to superintend was given the materials of an old cottage bought to enlarge the playground. I had been absent all the morning of one day, and, on arriving at the school, found the cottage gone. The foreman, with a smiling face, told me they had a lot of carts early, and carted it all away. He looked too happy, and, on looking the building over, I found a long and deep trench to the infants' school filled and nicely levelled up with concrete, ready to receive footings; but, on removing the top six inches, I found the grave of the old cottage, old bricks, plaster, and rubbish filled in the centre of the trench, and a little concrete plastered up the sides and bottom and over the top. I need not say there was a row till it was all taken out. If I had not discovered it, under the present feeling I should have been declared dishonest.

I think Mr. Robson was tripped by Mr. Christian's question, as all his specifications at the date I mention were for "joints of brickwork to be struck as the work proceeds." Builders were always asking to be allowed to point down on completion, and Mr. Combe gave them consent, I believe without Mr. Robson's knowledge.

I have examined some hundreds of old brick buildings of the date of Queen Anne and the Georges, but have never found *nick* pointing except as a repair. The joint used is the same in nearly all cases; thus, the joint is struck full and flat, level with the face of the brick, with the trowel, a jointer about a quarter-of-an-inch wide is then drawn along a straight-edge, leaving a slight groove about one thirty-second of an inch deep and a quarter-inch wide.

The strings and arches are always of orange-coloured bricks, gauged and set with a very close joint in lime putty and silver sand, and the joint



ironed full and flat. This white joint sets like cast iron.

Tuck pointing is a decided mistake.

ROBERT PHILLIPS.

20, Brook-street, Gloucester.

#### OLD COTTAGE ARCHITECTURE.

SIR,—I am not one of those who object to the 'simplicity' of the old cottages now being illustrated in your pages; and when the papers are completed I should be glad to see them separately published in a correspondingly simple and inexpensive form. The plans and diagrams, with the letterpress, are especially interesting. The sketches would, I venture to think, be more useful if they were given chiefly in outline, with some of the main dimensions, at any rate, figured upon them.

In the plans Mr. Nevill seems to have made rather a leap from the one-roomed cottage to a good-sized house (Rake House). I hope he will not forget the numerous old parsonages that remain,—now usually in the occupation of the parish clerks. In Kent and Sussex they are all of nearly the same plan and external appearance, containing a good-sized living-room, with two cellars or offices at one end, and two rooms above. Query,—What might their date have been? That they were originally occupied by the parish priests is, I think, tolerably certain, not only from tradition, but because the early stone-built parsonage at West Dean, near Eastbourne, which has some architectural pretensions, is of a precisely similar plan.

I cannot say I quite agree in the propriety of stripping the rough-cast which may now cover a timber cottage, when that proceeding is not necessary for repairs. I confess that to my mind the Staples Inn houses looked more "clothed and in their right mind" as they were.

R. C.

#### ANCIENT STONE CROSS FOUND AT GLOUCESTER.

SIR,—A glance at the views of an ancient cross found at Gloucester proves it to have been the work of Irish hands, without the confirmatory evidence furnished in Mr. Medland's letter.

He states that St. Oswald lived at Iona, which monastery was founded by the Irish saint Columba, or Columbkille, who was born A.D. 521, and was one of the earliest Irish missionaries from Ireland,—or, as it was then called, Scotia,—to England.

The Irish monks brought Irish artificers with them, and there are stone-towers and the remains of numerous crosses covered with Celtic ornament which prove the truth of the Irish annals, which record the missionary work done by the Irish monks in England long prior to the arrival of St. Augustine in A.D. 590.

The ornament on the Gloucester cross and the so-called Saxon crosses found at Peterborough, and illustrated in the *Builder* for August 25, is identical with that found on the crosses at Monasterboice, Glendalough, Clonmacnoise, and several other places in Ireland. Archaeologists have often been mistaken in attributing such work to Saxon hands, and I think that a careful examination will show how widely such Celtic remains are distributed through England. I have myself seen two Celtic crosses in the churchyard of Leek, in Staffordshire; and when on the A. A. Excursion last month in Derbyshire, came across the remains of a Celtic cross in the churchyard at Bradbourne, and a large number of beautifully-carved crosses and tombstones covered with Celtic interlaced ornament and Byzantine-like crosses in the porch of Bakewell Church, where they have been deposited, having been found built into the walls on the restoration of the church some years ago.—Yours, &c.,

JOHN L. ROBINSON.

148, Great Brunswick-street, Dublin.

Sept. 19, 1888.

#### CHURCH BUILDING NEWS.

**Clyst St. George, Exeter.**—A short time ago the new additions recently made to the chancel of the parish church of St. George, at St. George's Clyst, were for the first time used for Divine service. The new work consists of a vestry, choir, and organ chambers on the north-east end, porch and small transept on the south side, new chancel fittings and screens, and enlarged organ. The new masonry is of red Heavitree stone, with Bath stone dressings, and pitch-pine is used for the timbers of the roofs and the vestry fittings. The vestries and transept open into the chancel, and are divided therefrom by arcades of masonry. These arcades contain three parolose screens of English oak, surrounded by pierced crusting. The screens are the work of Mr. Harry Hems, of Exeter, and also two new priest's desks of carved oak and carved bench-ends to the enlarged stalls. The general contractors were Messrs. J. L. and

H. Steer, of Clyst St. George, and the architect was Mr. Robert Medley Fulford, of Exeter.

**Colchester.**—The upper part of the tower of St. Leonard's Church, Colchester, is being rebuilt, and portions of the church restored, by Mr. L. J. Watts, mason, of Colchester, the detail, except some portion found embedded in the eighteenth-century work, being designed by Mr. W. Scargill, architect, of the same town. We are informed that the original design is being followed as nearly as possible from the best ascertainable authorities. The portion of the tower rebuilt contains four three-light Perpendicular louvre windows, over which is a frieze and graduated battlement, with a small turret at each angle, and four lesser-sized windows over in the centres of the four sides. The tower is faced with rubble with Combe Down dressings, and the parapet faced with black flint.

**Newton Heath.** The Bishop of Manchester consecrated the new Church of St. Augustine, Newton Heath, Manchester, on the 12th inst. The church, which has only lately been completed, will accommodate 540 persons, and is built of red pressed bricks, the mouldings and tracery work being of Ruabon terra cotta. Early English Gothic is the style of architecture adopted, the nave being 44 ft. wide and 96 ft. long. The north transept is temporarily used for a vestry, the south transept being arcaded only, with a view to future extension. The chancel is 26 ft. wide, but is only 10 ft. in length at present, the choir stalls, pulpit, and reading-desk being placed on a raised platform in front. Future extension will be met by the erection of a south transept, the completion of the chancel, and the building of a vestry. The whole of the internal fittings, roof timbers, vestibule framing and doors, pews, pulpit, and communion rail are of varnished pitch pine. The floor of the church is laid with wood blocks, and the chancel and aisles are tiled. The church is ventilated by means of Boyle's ventilators on the roof, connected by galvanised iron tubes with the various ceiling ventilators. Hot-water pipes are fitted for heating purposes. The total cost, including boundary fences, laying out of the ground, fittings, and furniture is 4,000l. Mr. A. W. Smith, of Manchester, was the architect, and Mr. George Macfarlane, also of Manchester, was the contractor.

**Northstoke.**—The restoration of the little church at Northstoke (says the *Bath Chronicle*) has added another link to the chain that binds the city of Bath to Roman times. In addition to the exposure of a supposed Saxon sun-dial, further interesting discoveries have been recently made. The church, it is generally known, is situated close to the Roman Via Julia, which led from Bath to Caerleon, and on a portion of a Roman Villa, that, judging from fragments which have been found, must have been one of the largest in the neighbourhood. Its architecture probably even excelled that of those at Newton St. Loe and Wellow. In the work of restoration fragments of pottery have been found embedded in the walls, which lead to the belief that the church is of the most ancient foundation; indeed, it has been surmised from an inscription on the wall that it must have been a Christian edifice in Roman times. The chancel arch, instead of being set at right angles to the wall, is at an oblique angle, and built of very large stones, placed somewhat in the way that is known as "long-and-short" courses. The system of masonry, instead of being circular, leads to the belief that it was "blunt-pointed." At the side of the arch have been found the steps which lead to a roof loft. These were formerly hidden by the pulpit, which used to be on the south, and has now been removed to the north, and above them has been discovered the doorway which led to the loft itself. Here a notch in the stone shows the precise line of the loft. The church appears to have fallen into partial ruin some time after the Restoration, but was formerly a cell of Bath Abbey. Its architecture, with the exception of the porch and a buttress of the tower, justifies the belief that it was re-established about the time of Laud, or rather when he was bishop of the diocese previous to his translation to Canterbury. The old pews were of that date, and in the restoration the same pattern has been followed. To harmonise with this, the stalls of the chancel and the lectern have been made in the same style. The east window is entirely new, and in it has been placed the stained glass about which so much has been heard recently in connexion with St. Saviour's Church. Major Davis has been the architect for the new work, which has been

carried out by Messrs. W. Cowlin & Sons, of Bristol. The church was reopened on the 7th inst.

**Plymouth.**—The Bible Christian Chapel in Zion-street, Plymouth, which has been closed for alterations and repairs, was re-opened on the 12th inst. The old side and end galleries have been taken down and replaced by galleries of a more ornamental character, and the narrow pews, both in the body of the chapel and the galleries, have given place to open pitch-pine benches. Among other improvements are the lowering of the rostrum, the painting and re-decorating of the walls, and the fixing of ornamental gas brackets and pendants. Mr. H. J. Snell, of Plymouth, was the architect, the contractor being Mr. J. J. Marshall, also of Plymouth.

**Rockwell-green, Wellington.**—The foundation-stone of the new church of All Saints, Rockwell-green, Wellington, was laid on Monday, the 10th inst. The building will consist of a lofty nave with clearstory, 44 ft. high to the top of the roof, north and south aisles, chancel, north and south transept, and a vestry adjoining the north transept. A chamber for the warming apparatus will be built under the vestry. The tower, which is shown in the design, but which, as stated, is not included in the present contract, will be on the south side of the church, and the lower stage will form the main south entrance. The style of the building will be of the transition period from the Early English to the Decorated. The windows will be chiefly lancet, but the east window of the chancel is to be of three lights with tracery head. The walls are to be built of local red sandstone, laid on random courses, lined internally with brick and Hamdon-hill stone dressings. The roofs are to be covered with Staffordshire tiles, and the tower will be covered with a flat lead roof. The interior walls, to the height of 3 ft. from the floor, will be cased with red brick-work, above that line with brick-work of various colours. The pillars supporting the nave arcades will be of Hamdon-hill stone, and the arches will be of coloured brick-work. The roofs will be open-timbered, with tinted plastering between the rafters, except in the chancel, where the rafters are to be covered with boarding. The floors of the passages will be paved with tiles, also the whole of the chancel; but the floors under the seats are to be laid with wooden blocks or concrete. The church is to be fitted with open benches of pitch-pine. The chancel stalls will be of similar material, and the font and pulpit will be of Hamdon stone. The windows will be glazed with tinted Cathedral glass in lead-work, and the warming will be effected by means of water-pipes. Provision will be made for lighting the church by a row of gas-jets round the abacus of each pier of the nave arcade, and in the chancel there will be a corona suspended from the apex of the roof. It is estimated that the church will accommodate 450 people. The contract for the erection of the building, exclusive of the tower, amounted to nearly 3,000l. The architect is Mr. J. H. Spencer, of Taunton.

**Stockland.**—The parish church of Stockland, near Honiton, has just been reslated, with the exception of the chancel and the north chancel aisle. Moulded open benches of pitch-pine have superseded the high pews, the floors under the seats have been laid with wood blocks, and the passages have been re-arranged. The choir seats and prayer-desks have also been improved, and the chancel floor laid with Godwin's tiles, while a new oak Communion-rail has been fixed,—all to the architect's design. The Perpendicular font has been re-fixed on a Keinton stone platform in the tower. The east end of the north chancel aisle has been divided off by an ornamental wood screen to form the vestry, as it was originally, evidenced by the position of the formerly blocked-up doorway, now opened out. The south porch (till lately the vestry) has been restored, as it had been much mutilated, and brought back to its original object. The church is now warmed on Porritt's system of underground stoves. The architect was Mr. B. Edmund Ferrey, F.S.A., and the builder Mr. W. T. Berry, of Honiton.

#### SCHOOL-BUILDING NEWS.

**Twerton.**—On the 11th inst. the Bishop of Bath and Wells dedicated the Sunday-school, Parish Club-room, and Gymnasium, just erected in connexion with St. Peter's, East Twerton, Bath. The building has been erected from the designs of Mr. E. Buckle. The principal room, which will be used for Sunday-school and parish



berings, is 64 ft. by 32 ft., and is lofty well lighted. Adjoining is a reading-room, at 80 ft. by 24 ft., and there is another room which is to be used for a library. The large rooms on the first floor will be used to other purposes in connexion with school work. Mr. J. Long was the builder, and the cost has been upwards of 3,000*l*.

**Bristol.**—Some new schools were opened at Bristol on the 14th inst., which have been erected in the Easton-road for the Bristol Local Board. The schools, which are in the Gothic style of architecture, and are built of Pennant-stone, with freestone facings, consist of a central block and two wings. In former are eight school or class rooms, four each floor, each room being 29 ft. by 25 ft. These are capable of accommodating a total of 500 children, in four divisions. The class rooms on each floor can, by means of sliding screens, be thrown into one, giving the whole one large room, 58 ft. by 51 ft. The rooms on the ground floor are 14 ft. high and clear; those on the upper floor average 15 ft. high, being 12 ft. at the sides and 17 ft. in the centre. They are well lighted by large windows front and behind. The entrances for the infants are on each side, adjoining the central block. Those for the older children are at the extreme ends, opening into staircases 11 ft. wide, with steps 5 ft. long of an easy gradient, each step being 1 ft. wide with a riser of 6 in. Condensed rooms for the convenience of the teachers are situated in each wing, and lavatories are provided in separate buildings, with lobbies of communication from the landings and staircases of each of the four divisions. There are two playgrounds in the rear, each 60 ft. by 48 ft., containing 640 square yards, laid with spar-faced asphaltic paving, one of which is covered with play-sheds. The roofs of the floors and roofs of the central block of the building are supported by a single column of cast-iron, which is also designed to receive the ends of the four screens when closed. The upper floor is primarily supported by a large X girder extending from front to back, and resting on the central pillar. To this main girder are attached six smaller girders at right angles to it, which in their turn support the wooden joists of the floor. The central pillar also carries through the upper story to support in a similar manner the central girder on which the principals of the roof rest. This portion of the work has been carried out by Messrs. Sampson, engineers, of Bedminster. It is supplied to the schools by means of hot water on the system of Messrs. Skinner and Ward, of Stoke's-croft. The ventilation has been executed by Messrs. R. Boyle & Son, of London. The architects were Messrs. Hanson Bond, of Clifton, the contractor being Mr. R. Lewis, of Clifton-vaie, and the clerk of works was Mr. George Downes.

## The Student's Column.

### ARTIFICIAL STONES.—XII.

Concrete (continued).

**C. SELLAR'S** patent process, brought out in 1874, is decidedly more sensible, though not particularly novel. In this process the artificial stone was made by subjecting pressure a mixture of sand or other granular substances with Portland or other cement, powdered lime, or clay, which has been moistened with lime-water or water containing lime in suspension. Greatorex & Hall, for their patent "ferment" stone (1876, patent 4,137), employ dry-ground and carefully-tested Portland cement of high quality, in combination with damp sand, broken clinkers, stone, flints, gravel, or any other hard material; they then coat the blocks with a composition made as follows:—Portland cement is roughly mixed with iron filings, the mixture then perfectly but slightly wetted and placed in the moulds before the body of the stone is set, or instead of wetting the materials in the usual way, solution of sulphate of iron may be used. While in the moulds the composition is subjected to great pressure, and when quite set the block is placed in a bath of dilute sulphuric acid, which impregnates the body of the material, forming sulphate of iron, which is slowly decomposed, as already explained, rendering the stone more durable. G. Hodson, in his patent for the production

of an artificial stone for making chimney-pieces, vases, columns, &c., directs that Portland, Roman, Keene's, or similar cements be mixed with granite, slag, gravel, broken stone, &c., and incorporated with dilute sulphuric acid, or, in some cases, with water only. The articles, when dry are glazed and enamelled as may be necessary.

**E. Schaffer's** artificial stone is formed from a mixture of 1 part of cement and 3 parts of sand, made into a paste, with a two-per-cent. solution of sulphuric acid, and subjected to strong pressure. The stones are dried in the air for a couple of days, and then placed for twelve hours in a three-per-cent. solution of acid, and finally dried.

**Westermeyer's** artificial stone, at one time largely used in America, was formed of 2 parts of Portland cement, 1 part of sand, and 1 part of cinders, mixed together dry, and then moistened with an aqueous solution of sulphate of iron. The resulting mortar is pressed into moulds, dried in a warm place for two weeks, then placed in water for twenty-four hours, and finally dried in air for four weeks.

**Queenot** employed a solution of 1 part of alum in 15 parts of water added to a mixture of 2 parts of hydraulic lime, 10 parts of sand, and 1 part of cement, to the required consistency, pressed into moulds, and allowed to remain for twenty-four hours. In fourteen days the stone will be ready for use, and will improve with age. Alum is here a decidedly effective addition, sulphate of lime, alumina, and probably a double sulphate of lime and potash being formed in the body of the stone.

**W. J. Bennett's** solution for increasing the hardness of concretes and artificial stones made from Portland or other cement was composed of a mixture of water, carbonate of soda, sal ammoniac (chloride of ammonium), and alum. We have already commented on the importance of a violent trituration of the concrete mixture, as being generally necessary to secure the best results, and we instanced J. Gibb's patent of 1850 as one of the earliest patented recognitions of this fact in this country. We must now return to this matter, and briefly deal with Coignet's processes, which have been so largely and successfully employed in France. A brief mention of the process only is necessary, as already in our columns, and in those of other journals, numerous and detailed reports have been given. In 1855 Coignet obtained his first patent in this country, followed by others in 1859, 1863, and 1869. In none of the published specifications are there any points of absolute novelty, and the wide success obtained for Coignet's béton (or concrete) was due to an intelligent combination of already well-known facts, and not to any revolutionary discovery. The secret of success is the manipulation of small quantities at a time of the concrete mixture, consisting of varying proportions of lime, cement, sand, gravel, stones, &c. (a favorite mixture being one of 5 parts of sand, 1 of lime, and 25 of hydraulic cement), with the smallest possible amount of water; these materials are pounded together, and when thoroughly incorporated placed in moulds, or in the position where they are to remain, and heavily rammed. A considerable diminution of volume results, owing to the expulsion of the air, and the effectual closing of the spaces between the component particles. The amount of this reduction of volume of course depends on the composition of the stone; in the case of the mixture above-mentioned it is as 1·7 to 1, and one cubic foot will weigh 140 lbs.

The concrete or béton soon hardens in the air, and is far more resistant to pressure, atmospheric and other influences, than is the ordinary material.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

13,786, Glazing, &c. J. W. Helliwell.

This invention has reference to a prior patent. In this improvement the glazing bar or astragal is somewhat in the form of a T, but made with three channels in the horizontal part, one in the centre thereof and one on each side. The vertical edges of the sheets of glass rest upon the opposite edges of the centre channel, but above or clear of the outer lip or edges of the two outside channels. In order to secure the sheets of glass, a cap is placed over the adjoining edges of the sheets, kept down

by a set screw, which pierces the cap and passes through the space between the adjoining edges of the sheets and into a screwed hole in the bottom of the central channel of the bar. Thus, the sheets are held in position, whilst the several channels receive and collect the condensed or other water, which is afterward conveyed away by any suitable arrangement of pipes.

13,885, Manufacture of Paint. A. G. Wass.

The object of this patent is to utilize a waste product from mineral oils. The acid tar or tarry residue is heated, and a due proportion of resin added. Other acids, sulphuric or nitric, are added, and the mixture is thinned down with benzoline, turpentine, or such-like solvent. Paint, in black or colour, is made from this compound.

13,920, Sanitary and Drain-pipes and Retorts. J. & B. Craven.

This invention relates to hydraulic presses for moulding pipes in parts, the water-pressure being placed above and around the articles to be moulded.

14,066, Hinges. J. E. Beazland.

This patent consists of a peculiar form of hinge, with a method of fixing which will cause the door to rise on being opened for the purpose of clearing the mat or carpet. When the open door is set at liberty, this hinge will cause the door to close automatically.

15,596, Artificial Pavement. J. W. Mac-knight.

This invention consists of a pavement of great durability; the upper layer of this pavement, and also the layer next below, are curved downwards at the curb, and thus the ordinary flag or curb stones are dispensed with. The result is a pavement of superior finish and strength, and one which leaves no seams at the curb.

16,234, Wall Ties or Bond Iron. J. Sheldon.

The improvement which is the subject of this patent consists in making with the pieces or lengths of hoop iron, of which the ties are made, a series of corrugations or undulations crossing the said pieces or lengths at right angles to the longer sides. In these corrugations a series of depressions, hemispherical in shape, are made, and these again are perforated to allow condensed moisture, or any liquid falling thereon, to escape.

#### NEW APPLICATIONS FOR PATENTS.

Sept. 7.—12,924, J. Bradshaw, Chimney-pot or Top.—12,946, T. Line and J. Daveney, Wooden Wainscots, Ceilings, &c.—12,957, T. Shouler, Springs and Checks for Doors, &c.

Sept. 8.—12,984, G. Robinson, Preventing the Spread of Fire in Buildings.—13,009, R. Holdsworth and H. Garland, Door and other Bolt Locks.

Sept. 10.—13,040, H. McKibbin, Arrangement of Window Frames or Sashes, and Fasteners thereof.—13,059, W. Jarvis, Wall-blocks for Buildings.

Sept. 11.—13,096, J. Rogers, Flushing Cisterns, or Water Waste Preventers.

Sept. 12.—13,156, W. Joynson, Roof Gutters.—13,158, J. Lawson, Heating Buildings by Air and Water.—13,167, W. Jago, Bakers' Ovens.—13,170, J. Kaye, Opening and Closing Fanlights, &c.—13,177, R. Thomson, Combined Lavatory and Water-closet Basins.—13,163, W. Jones, Covering, Lining, and Panelling Walls and Ceilings of Offices, Shops, Passages, &c.—13,201, H. Sharman, Thief-proof Windows and Rising Latch Fasteners.—Sept. 13.—13,243, A. Turnbull, and J. Mathieson, Stoves and Cooking-ranges.—13,244, T. Knowles, Mantelpieces.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

14,951, T. Minton and others, Printing upon Pottery and Tiles.—3,134, E. Tobin, Ventilating Dwellings and other Structures.—10,238, J. W. Way, Chimney-pots.—10,674, T. and J. Holt, Cisterns for flushing Urinals.—10,882, E. and E. Kerr, Joint for Drain-pipes, &c.—10,922, J. de Jong, Tip-waggons.—11,198, E. Brooks, Burning White or Coloured Glazed Bricks and Pottery.—11,238, S. Edmonds and W. Timbrell, Catches or Fasteners for Doors, Gates, &c.—11,260, R. Stevens, Such Fasteners.—11,270, J. Fejer, Safety Grates or Tralls for Windows.—11,290, E. Poole, Roofing Tiles.—11,433, J. Jackson, Radiators for Warming and Ventilating Buildings.—11,483, H. Planner, Disinfecting Apparatus for Water-closets.—11,737, G. Binawanger, Electric Bell Pushes.—11,798, W. Woodall, Fittings for Electric Bells.—11,908, W. Stock, Flushing Apparatus for Water-closets, &c.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

14,776, S. Timings and S. Hill, Spring Catches or Fasteners for Doors, Windows, &c.—14,951, T. Minton and Others, Printing upon Pottery and Tiles.—15,258, E. Church, Kitchen Ranges.—15,372, J. Morris, Ventilator and Chimney Cow.—15,405, W. Yates, Ventilating Fans.—15,483, J. Boulter, Automatic Indicator for Water-closets.—17,666, G. Layton, Manufacture of Cement.—17,556, H. Stockman, Ventilators.—17,967, B. Gregory, Blue Bricks, Tiles, Fire-bricks, &c.—5,931, D. Hoey, Ventilating Halls, Rooms, &c.—7,251, R. Partridge, Door Latches.—9,591, E. Thorp, Wind and Water Bars for Meeting Rails,



Top and Bottom Rails of Sliding Sashes, Top Rail and Stiles of Casement Sashes, and the Top Rail and Stiles of Doors.—10,051, J. Witt, Raising or Lowering the Temperature in Buildings, &c.

# RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

SEPT. 10.

By ALFRED THOMAS, FEYER, & MILES.  
Baldock, Herts.—Stead's Brewery, with malting, goodwill, and sixty-seven public-houses ..... £22,500

SEPT. 12.

By ELLIS, MORRIS, SUTHERLAND, & CO.  
Westminster—33 and 34, New-street, 14 years, ground-rent £8 ..... 400

SEPT. 13.

By D. WATNEY & SONS.  
Canonbury—8, Aylmer-grove, 57 years, ground-rent £10 ..... 420

By C. C. & T. MOORE.

Mile End—55, 61, and 63, Bloomfield-road, 79 years, ground-rent £10 ..... 845  
Shadwell—3 and 4, Albert-street, 74 years, ground-rent £12 ..... 650  
Commercial-road—3 and 4, Manor-court, copyhold Old Ford—23, Ellesmere-road, freehold ..... 210  
..... 390

By E. STIMSON.

Bermondsey—98, 99, and 100, New Church-road, 10 years, ground-rent £8 ..... 185  
Peckham—50, Chadwick-road, freehold ..... 310  
Stockwell—5 and 6, Hubert's-grove, 88 years, ground-rent £13 ..... 400  
Camberwell, Picton-street—A plot of freehold land, 62 ..... 62

By WILKINSON & SON (at Brighton).

Brighton—3, Middle-street, freehold ..... 1,020  
4 and 5, Silwood-road, freehold ..... 1,310

# MEETINGS.

THURSDAY, SEPTEMBER 25.

*Society of Engineers.* Visit to the London and South Western Railway Locomotive and Carriage Works at Nine Elms, S.W. Party to assemble at the entrance in Hemmestreet, Wandsworth-road, at 1.45 p.m.  
*Glasgow Architectural Association.* Visit to Barony Established Church, 8.15 p.m.

WEDNESDAY, SEPTEMBER 26.

*Buller's Foremen and Clerks of Works' Institution.* Quarterly Meeting of the Directors, 8.30 p.m.

# Miscellanea.

**Safety of Exits in Theatres.**—The *Hamburger Nachrichten* states that a locksmith in that city, by name Wolff, has constructed an apparatus whereby all the doors in a theatre may be opened simultaneously. The other day experiments were made with the apparatus at the Concordia Theatre, and on somebody shouting "Fire," the inventor turned the handle of the apparatus, fixed in the refreshment-bar of the theatre, on which every exit in the whole building opened at once. The arrangement does not preclude the opening of each door in the ordinary manner.

**New Buildings at Loughborough.**—The Fearon Memorial Hall and Schools at Loughborough are now making progress under the supervision of Mr. Geo. Hodson, C.E., the architect, and Mr. W. Needham, the contractor. We learn that a site has been purchased for the erection of a new church on the Paget estate, where it is proposed to immediately erect a large iron mission room for use during the time the necessary funds are provided for the new church.

**Discovery of Roman Remains on the Danube.**—The *Wiener Zeitung* states that the remains of a Roman amphitheatre have been discovered at Deutsch-Altenburg, on the Danube. The exceedingly level state of the ground in a corn-field led to the surmise of there being some walls beneath, and on excavations being made, a gallery and remains of a Roman amphitheatre were discovered. Close by, the remains of a Roman road were also discovered.

**Belfast Main Drainage Scheme.**—On the 12th inst., Mr. McCammond, Chairman of the Belfast Town Improvement Committee, performed the ceremony of cutting the first sod in connexion with the Belfast Main Drainage Scheme. Mr. J. C. Bretland, Borough Surveyor of Belfast, has been appointed engineer to the works, which, it is estimated, will cost about £300,000.

**Wallingford.**—A Church House and Sunday School, in connexion with St. Leonard's Parish, has been recently opened in Wallingford by Lady Wantage. The architect was Mr. S. C. Johns, of Crownmarsh, Oxon, and the contractors, Messrs. Brasher Bros., a local firm.

**Roman Catholic Cathedral in Pekin.**—The *Popolo Romano* states that active progress is being made with the new Roman Catholic Cathedral now in course of erection in Pekin, 600 workmen being at present engaged on the work.

# The Explorations at Roche Abbey.

During the past twelve months the work of exploration has been steadily progressing at Roche Abbey, upon the estate of Earl Scarborough. Roche Abbey was founded about 1147 for Cistercian monks. Of late, the work of excavation has been conducted by the Rev. F. H. Valpy, chaplain to Earl Scarborough. Some time ago his Lordship exhibited before the Society of Antiquaries a remarkable block of stone, a cube of 9 in. with a cavity in the top, covered by a smaller stone, which had been discovered in the ruins. When opened it was found to contain a relic, consisting of a splinter of bone, and a broken iron ring, wrapped up in sheet lead. Mr. W. St. John Hope and Mr. J. T. Micklethwaite, who inspected it, suggested that the relics were those of St. Godric, whose mail-shirt was a source of numerous like treasures over the North of England, and that the stone has been built upon one of the altars. The screen of the edifice has been unearthed, and is 78 feet from the main (western) entrance, and 81 ft. 9 in. from the chancel steps. There are three doorways at the western side, and these are laid open to view. The position of the choir-stalls has been fixed, while in the body of the church, just outside the screen, are several tombs bearing inscriptions and designs. The one immediately in front of the door leading to the choir-stalls is a slab with an English inscription, and supposed to be the middle or the end of the fifteenth century; nearly all the words have been deciphered, but a few are too much broken for identification. It reads—"Here lygges Peryn of Doncastre, and Isabel his wyfe, a gude tru-brother while he was on lyfe. Jesu by Thy mercy bring them to blysse, Pater noster for them, whose redits thys." Another contains a Latin inscription to the following effect—"Here lies Rikston, gentleman, a benefactor of this monastery who died the 9th day of August, in the year of our Lord 1498, to whose soul may God be favourable, amen." An adjoining tombstone bears the name Rikstone, and is evidently belonging to the same family. There are three others which appear to be of an older date, two of them bearing no inscription at all. The kitchen has been explored, and the walls of the refectory have been traced, and will be soon worked out. *Leeds Mercury.*

**National Registration of Plumbers.** A presentation of certificates took place in the Town-hall, Dundee, on Saturday afternoon. Mr. John J. Henderson, A.M.I.C.E., presided, accompanied by Mr. W. Farquharson, Secretary to the District Council. The Chairman, after referring to the spread of the movement, said that probably no artisan holds the keys of disease in his grasp so completely as the plumber. His by good workmanship may excommunicate forces inimical to health, or by his incompetency may give entrance to malign influences that inflict suffering, and even death, upon their victims. He hoped the classes about to be started through the District Council would gradually tend to establish a high order of proficiency in the craft. Eight certificates were then presented, which, along with those presented last week in Fife and Perth, make eighteen for this month.—*Dundee Advertiser.*

**The Electric Light in Berlin.**—Experiments are now being made in Berlin with the electric light for street lighting, the first thoroughfare in which it has been introduced being the well-known avenue Unter den Linden. This is lighted by 108 arc lamps, extending from the Pariser Platz to the Royal Palace. The lamps are suspended from chains running between cast-iron poles 24 ft. in height. The latter are round, and ornamented with heads of lions and the Imperial arms at the base, and an eagle at the top. In the central avenue the distance between the lamps is about 100 ft., but in other parts, except at the crossing of the Friedrich's Strasse, more. The motive power is supplied by four dynamos stationed in the adjacent Maner Strasse, and the strength of each lamp 2,000 candle-power. Up to the present the experiment has been a great success.

**Milford-on-Sea.**—A large new hotel, to be called the "Hotel Victoria" (why not the "Victoria Hotel," seeing it is in England, and not in France?), is to be erected here. The builders, Messrs. Rashley Bros., of Lymington, have entered into a contract with the owner of the estate to erect and complete the hotel within eighteen months. The architect is Mr. Evans, of Lymington and Westminster, the surveyor to the estate. We hope the hotel is not going to be "rushed up" too quickly for good building and proper finish.

# New Roman Catholic College at Tooting.

The large and costly new Roman Catholic college, which has for some time past been in course of erection at Tooting, and is now completed, was opened on Monday for the reception of students. The building has been erected on the Hill House Estate, immediately adjoining Tooting Bec-common. The mansion and estate, which cover an area of nearly twenty acres, were purchased for the purpose of the college for about £15,000. The highest point on the estate has been selected for the college buildings, which cover a ground area of 20,000 square feet, and rise in four stories to a height of 74 ft. From the roof springs a turret, which serves the twofold purpose of a clock-tower and observatory. The buildings are in red brick and Portland stone dressings, the style of architecture being French Renaissance. The basement floor contains the kitchen, refectory, college-hall, play-rooms, and bath-rooms. On the ground floor are the reception-rooms, class-rooms, study-halls, physical and chemical lecture-rooms, and laboratories. The laboratory fittings have all been made by Mr. Heywood, of Manchester, who fitted up all the appliances at Owens College. The chapel is on the first floor. The altar is in Caen stone, the altar table being of white-veined marble, supported by four pillars of Irish marble. The organ has been built by Mr. Ingram, of Holloway. The building is heated by hot-water pipes. These pipes have been planned and fitted by Messrs. Barry & Sons, of Westminster. The sanitary arrangements have all been carried out by Messrs. Finch & Co., of Lambeth. The dormitory arrangements in the upper floors have been carried out by Messrs. Shoobred & Co., of Tottenham-court-road. The college has accommodation for 200 resident students, and as many day students. Mr. W. Harvey, of Whitehall-place, is the architect, and Messrs. Higgs & Hall are the contractors, their contract being about £40,000. The grounds have been ornamentally laid out for recreation purposes, six acres having been set apart for cricket-playing. The mansion, which was included in the purchase, will be used as the sanatorium of the college.

**New Theatre, Coventry.**—A new theatre, which is expected to be ready for opening early in the coming year, has been commenced at Coventry. The building, which is situated in Hales-street, will be of red brick with stone dressings, and will be decorated with carved brick and stone work. The auditorium will contain pit and stalls on the street level; dress circle tier, with boxes, and gallery tier; and each part of the house will have two distinct exits or staircases. Access will be gained from Hales-street through four pairs of folding doors, to the central vestibule, from which a double staircase will lead to the dress circle and boxes; and between the staircases will be a passage leading directly into the pit. On each side of the box entrance will be double entrances to the pit and gallery. The pit will be 48 ft. wide and 54 ft. long. On the opposite side of the pit will be another exit from that part of the house and the stalls. Passing up the double staircase in the central vestibule a wide foyer will be reached, from which an entrance will be gained to the dress circle tier. The gallery, which will contain eight rows of seats, will be approached by two wide staircases, access being gained to them through the triple sets of folding doors which serve for double entrances to pit and gallery. The stage will be nearly 70 ft. wide, while its depth will be 30 ft.; and it will be of fire-proof construction. In front of the proscenium there will be a wide orchestra, and the orchestra and staircases will rise from the orchestra stalls on each side to the dress circle. The internal decorations will be in a free Renaissance style, incrusta designs and gilding being largely introduced. The tiers will be supported by light pillars. The architects are Messrs. Essex & Nicol, of Birmingham, and Mr. C. G. Hill, of Coventry, is the contractor.

**Proposed Sewage Scheme for Fulwood.**—Mr. Taylor, an Inspector of the Local Government Board, has held an inquiry into the sewerage scheme for which the Fulwood Local Board have applied for sanction to borrow £1,000. The Fulwood Board propose to adopt Mr. Conder's system of purification. The scheme was opposed at the inquiry on the ground that a very extensive sewerage scheme for Preston was in preparation, that Fulwood would soon be practically a part of Preston, and that it was undesirable to multiply sewerage schemes.



**de of Building Land near Herne**  
 —About a mile to the west of Herne Bay, a sea-side locality, designated Hampton-on-Tees, is at present being laid out for building. The property includes what is called the old Parade Estate, on which several roads of the sea are now in course of formation. Monday last, the first portion of the property offered for sale in a marquee on the estate, Messrs. Baker & Sons. The plots offered numbered 146 in number, and included a hotel and small shop plots, in addition to sites for private houses, described as well adapted for the erection of bungalows, rustic cottages, and small-sized villas. There was a numerous number present at the sale, a special train from Holborn Viaduct station to Herne Bay ran down upwards of 300 buyers and others. Plots submitted contained frontages varying from 19 ft. to 24 ft., and depths of from 70 ft. to 100 ft. On the sale commencing, there was a keen and severe competition for the several plots, all of which were sold within an hour, and purchasers taking as many as six, ten, and twelve lots each. The prices realised varied from 10s. to 12s. each for the sites in the running southwards from the sea, whilst the sites in Hampton-parade, facing the sea, were sold for 20s. each. The hotel plot realised the proceeds of the sale amounted to £2,000. Several acres on the estate have been reserved for the formation of public gardens, and the erection of a free library and a reading-room.

**Proposed Registration of Plumbers.**—A largely-attended meeting to consider the question of the registration of plumbers was held on Monday evening, at the Town-hall, Hampton-on-Tees, under the presidency of the Mayor. In opening the proceedings, the Mayor remarked that the object of the registration was not to promote any trade interest, but to promote the public health. The purpose of the meeting was to appoint local representatives to the district council, formed to deal with the registration of plumbers in the four northern counties and the North Riding of the shire. The council consists of an equal number of representatives of the master plumbers and of the public. Mr. H. Clegg (medical officer), who was elected by the public representatives elected, cited from his own personal experience where gas had been most carefully laid on in houses in which fever had broken out. A second meeting was held at the Free Library, Liverpool, under the presidency of Mr. J. B. Smith, Chairman of the Liverpool Health Committee. Representatives for the district registration committee were elected—among others Dr. Ford Taylor, Dr. Vacher, and Dr. Sprake (medical officers of health for Liverpool, Middlesbrough, and Bootle, respectively), and Mr. J. B. Smith, president of the Liverpool Architectural Association, to represent the public.

**The English Iron Trade.**—The English market maintains a steadily upward tendency, and an activity which has seldom been witnessed. At the same time, the trade done is a thoroughly sound character, and the demand genuine, very little speculative business being attempted. Although the Glasgow market has fluctuated greatly during the week, this has not interfered with the trade by Scotch makers, who have advanced quotations, the enhancement ranging from 6d. to 2s. 6d. a ton, according to brand. Land ironmasters are also holding out for more money, and the price of No. 3 Westbrough is firm at 55s. 3d., prompt, and 1s. a ton more. In Lancashire, pig-iron is a ton dearer. Bessemer iron from the North-west, has been put up from 6d. per ton. The manufactured iron market is very active. Advances of 2s. 6d. for plates, 5s. for ship-plates, and 2s. 6d. for angles are announced. The demand is heavy, as is also that for steel. Steel shipments are very firm at 7l. and 7l. 2s. 6d., and have gone up to 6l. 10s. and 6l. 12s. 6d. for prompt delivery, ship-builders have to 6s. 6d. and even 5s. per ton more. The effects of the ship-building trade have never been brighter. There is a continued steady movement in engineering.—*Iron.*

**Reddish Paviers in St. Petersburg.**—In order to teach Russian workmen the methods of paving with granite, and to superintend the extensive works of paving to be taken in St. Petersburg, and to which recently referred, twenty-five master-pavers have been introduced from Stockholm to the Russian capital.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                               |           | £. s. d. | £. s. d. |
|---------------------------------------|-----------|----------|----------|
| Teak, E.I., .....                     | load      | 8 0 0    | 12 10 0  |
| Sequoia, U.S., .....                  | foot cube | 0 2 3    | 0 3 0    |
| Birch, Canada, .....                  | load      | 2 15 0   | 4 15 0   |
| Fir, Dantisc, &c., .....              | load      | 2 0 0    | 4 0 0    |
| Oak, .....                            | load      | 2 0 0    | 4 10 0   |
| Canada, .....                         | load      | 4 0 0    | 6 10 0   |
| Fine, Canada red, .....               | load      | 2 10 0   | 3 10 0   |
| " Yellow, .....                       | load      | 2 10 0   | 4 0 0    |
| Lath, Dantisc, .....                  | fathom    | 3 10 0   | 6 0 0    |
| St. Petersburg, .....                 | load      | 5 0 0    | 6 0 0    |
| Waincoat, Odessa, crown, .....        | load      | 2 10 0   | 3 0 0    |
| Deals, Finland, 2nd and 1st, std. 100 | load      | 8 0 0    | 9 10 0   |
| " 4th and 3rd, .....                  | load      | 6 10 0   | 7 10 0   |
| Riga, .....                           | load      | 8 0 0    | 7 10 0   |
| St. Petersburg, 1st yellow, .....     | load      | 9 10 0   | 15 0 0   |
| " 2nd, .....                          | load      | 8 0 0    | 9 0 0    |
| " white, .....                        | load      | 7 10 0   | 10 0 0   |
| Swedish, .....                        | load      | 7 10 0   | 16 10 0  |
| White Sea, .....                      | load      | 8 10 0   | 17 10 0  |
| Canada, Fine, 1st, .....              | load      | 15 0 0   | 24 0 0   |
| " 2nd, .....                          | load      | 9 10 0   | 15 10 0  |
| " 3rd, &c., .....                     | load      | 7 10 0   | 9 10 0   |
| " Spruce, 1st, .....                  | load      | 8 10 0   | 9 10 0   |
| " 2nd, .....                          | load      | 6 0 0    | 7 10 0   |
| New Brunswick, &c., .....             | load      | 6 10 0   | 7 5 0    |
| Battens, all kinds, .....             | load      | 4 10 0   | 11 0 0   |
| Flooring Boards, sq., 1 in., pre-     | load      | 0 10 8   | 0 13 6   |
| pared, Fir, 2nd and 3rd, .....        | load      | 0 7 0    | 0 10 3   |
| Other qualities, .....                | load      | 0 4 6    | 0 6 9    |
| Cedar, Cuba, .....                    | foot      | 0 0 3    | 0 0 3    |
| Honduras, &c., .....                  | load      | 0 0 0    | 0 0 0    |
| Australian, .....                     | load      | 0 0 2    | 0 0 3    |
| Mahogany, Cuba, .....                 | load      | 0 0 4    | 0 0 4    |
| St. Domingo, cargo average, .....     | load      | 0 0 4    | 0 0 4    |
| Mexican, .....                        | load      | 0 0 4    | 0 0 4    |
| Tobacco, .....                        | load      | 0 0 4    | 0 0 4    |
| Honduras, .....                       | load      | 0 0 4    | 0 0 4    |

| TIMBER (continued).    |      | £. s. d. | £. s. d. |
|------------------------|------|----------|----------|
| Box, Turkey, .....     | ton  | 5 0 0    | 12 0 0   |
| Walnut, Italian, ..... | foot | 0 0 4    | 0 0 6    |

## METALS.

|                                   |     |          |         |
|-----------------------------------|-----|----------|---------|
| IRON—Bar, Welsh, in London, ..... | ton | 4 17 6   | 5 0 0   |
| " at works in Wales, .....        | ton | 4 7 6    | 4 10 0  |
| " Staffordshire, in London, ..... | ton | 5 5 0    | 6 15 0  |
| COPPER.                           |     |          |         |
| British, cake and ingot, .....    | ton | 77 0 0   | 78 10 0 |
| Best selected, .....              | ton | 79 0 0   | 80 0 0  |
| Sheets, strong, .....             | ton | 85 0 0   | 0 0 0   |
| Chill, bars, .....                | ton | 95 0 0   | 97 0 0  |
| LEAD.                             |     |          |         |
| Pig, Spanish, .....               | ton | 13 10 0  | 0 0 0   |
| English, common brands, .....     | ton | 13 16 0  | 13 17 6 |
| Sheet, English, .....             | ton | 14 15 0  | 0 0 0   |
| SPELTER.                          |     |          |         |
| Silesian, special, .....          | ton | 18 15 0  | 19 0 0  |
| Ordinary brands, .....            | ton | 13 16 0  | 18 17 6 |
| TIN.                              |     |          |         |
| Straits, .....                    | ton | 104 0 0  | 0 0 0   |
| Australian, .....                 | ton | 104 0 0  | 0 0 0   |
| English Ingots, .....             | ton | 107 10 0 | 0 0 0   |
| Zinc—English sheet, .....         | ton | 21 0 0   | 0 0 0   |

## OILS.

|                               |        |         |         |
|-------------------------------|--------|---------|---------|
| Linseed, .....                | ton    | 19 10 0 | 19 12 6 |
| Cocunut, Ceylon, .....        | ton    | 26 0 0  | 28 0 0  |
| Ceylon, .....                 | ton    | 25 0 0  | 0 0 0   |
| Palm, Lagos, .....            | ton    | 23 0 0  | 0 0 0   |
| Rapeseed, English pale, ..... | ton    | 28 10 0 | 0 0 0   |
| " brown, .....                | ton    | 27 0 0  | 27 5 0  |
| Cottonseed, refined, .....    | ton    | 21 15 0 | 22 0 0  |
| Tallow and Oleine, .....      | ton    | 26 0 0  | 45 0 0  |
| Lubricating, U.S., .....      | ton    | 4 0 0   | 6 0 0   |
| " refined, .....              | ton    | 7 0 0   | 12 0 0  |
| TURPENTINE.                   |        |         |         |
| American, in casks, .....     | cwt.   | 1 8 9   | 0 0 0   |
| Stockholm, .....              | barrel | 0 16 0  | 0 16 6  |
| Archangel, .....              | barrel | 0 10 0  | 0 10 6  |

## CONTRACTS AND PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                    | By whom required.                     | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|--------------------------------------------------|---------------------------------------|-----------------------------------|--------------------------|-------|
| Re-construction of Sanitary Fittings, &c., ..... | Romford Union                         | C. J. Dawson                      | Sept. 24th               | ii.   |
| Laying Cast-iron Pipes, .....                    | Nelson Local Board                    | J. Newton & Son                   | Sept. 27th               | ii.   |
| Sluice Valves, Hydrants, &c., .....              | do.                                   | do.                               | do.                      | ii.   |
| School Extensions and Alterations, .....         | Burton-on-Trent (U.D.)                | R. Churchill                      | do.                      | ii.   |
| Broken Granite and Flint, .....                  | Twickenham Loc. Board                 | H. M. Ramsay                      | do.                      | xii.  |
| School Room, Llanelli, .....                     | The Committee                         | Official                          | Sept. 28th               | xi.   |
| Two Shelters, .....                              | Lyham Imp. Com.                       | do.                               | do.                      | xii.  |
| Thomas Ballast, Sand, and Cement, .....          | Fulford Vestry                        | do.                               | Oct. 1st                 | xi.   |
| Yellow Deal Blocks for Paving, .....             | do.                                   | do.                               | do.                      | xi.   |
| Rain-water Tank, .....                           | St. Marylebone Grdns.                 | J. Anstie                         | do.                      | xi.   |
| Repairs, Cleansing, &c., School, .....           | St. Matthew (Bethnal Green) Guardians | A. & C. Harston                   | Oct. 2nd                 | xi.   |
| Dwarf Wall and Iron Fence, .....                 | Brentford Local Board                 | Lacey                             | do.                      | xi.   |
| Broken Granite, .....                            | Aldershot Local Board                 | W. L. Coulson                     | do.                      | xi.   |
| New Passenger Station, North Shields, .....      | North Eastern Ry. Co.                 | W. Bell                           | Oct. 3rd                 | xi.   |
| Stone for Macadamizing, .....                    | Hull Corporation                      | A. E. Wilson                      | Oct. 4th                 | xi.   |
| Sea-wall and Esplanade, .....                    | Sandown Local Board                   | J. Newman                         | do.                      | xi.   |
| Pipe-Sewers, &c., .....                          | Wanswell Local Board                  | Official                          | do.                      | xi.   |
| Houses with Outbuildings, Seaton Sluice, .....   | Admiralty                             | do.                               | Oct. 5th                 | xi.   |
| Rolls Iron Girders, .....                        | Hornsey Local Board                   | T. De Courcy Meade                | Oct. 4th                 | xi.   |
| Road-Making Works, .....                         | do.                                   | do.                               | do.                      | xi.   |
| Drainage Works, .....                            | Ecclesall Bierlow R.S.A.              | T. G. Edwards                     | Oct. 10th                | xii.  |
| Works and Repairs to Buildings, .....            | Com. of H.M. Works                    | Official                          | Oct. 12th                | xii.  |
| Hospital, Hereford, .....                        | do.                                   | E. H. Lingen Barker               | Not stated               | xii.  |

## PUBLIC APPOINTMENT.

| Nature of Appointment.                     | By whom Advertised.  | Salary. | Applications to be in. | Page. |
|--------------------------------------------|----------------------|---------|------------------------|-------|
| Surveyor and Inspector of Nuisances, ..... | Dartford Local Board | 200l.   | Sept. 27th             | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                        |            |
|----------------------------------------------------------------------------------------------------------------------------------------|------------|
| BATTERSEA.—For new bakery, stables, &c., in Harroway-road, Battersea, for the Battersea and Wandsworth Co-operative Society, Limited:— | £2,217 0 0 |
| Beal, .....                                                                                                                            | 1,899 0 0  |
| Richardson & Co., .....                                                                                                                | 1,811 0 0  |
| Brickell, .....                                                                                                                        | 1,784 0 0  |
| Hammond (accepted), .....                                                                                                              | 1,765 0 0  |
| CHELMSFORD.—For the erection of a vestry-hall in New-street, for the Parish Officers. Mr. F. Whitmore, architect, Chelmsford:—         | £476 0 0   |
| H. Potter, .....                                                                                                                       | 465 0 0    |
| A. Roper, .....                                                                                                                        | 432 0 0    |
| G. Beaumont, .....                                                                                                                     | 429 0 0    |
| Mrs. Moss, .....                                                                                                                       | 429 0 0    |
| W. Fincham, .....                                                                                                                      | 419 0 0    |
| Frank Johnson, .....                                                                                                                   | 377 0 0    |
| C. J. Baker (from revised plans)*, .....                                                                                               | 456 0 0    |

\* Accepted.

|                                                                                                                                                                    |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| FULHAM.—For stables, superintendent's house, &c., in Munster-road, for the Fulham Vestry. Mr. J. P. Norrington, architect. Quantities by Mr. F. H. A. Hardcastle:— | £7,200 0 0 |
| Temple & Graham, .....                                                                                                                                             | 6,965 0 0  |
| Longley, .....                                                                                                                                                     | 6,924 0 0  |
| Henley & Co., .....                                                                                                                                                | 6,676 0 0  |
| Woodhouse, .....                                                                                                                                                   | 6,338 0 0  |
| Foster & Dickson, .....                                                                                                                                            | 6,320 0 0  |
| Beller, .....                                                                                                                                                      | 6,250 0 0  |
| Higgs, .....                                                                                                                                                       | 5,919 0 0  |
| J. O. Richardson, .....                                                                                                                                            | 5,580 0 0  |
| Ashford, .....                                                                                                                                                     | 5,417 0 0  |
| Nye & Co., .....                                                                                                                                                   | 5,249 0 0  |
| Brickell, .....                                                                                                                                                    | 5,168 0 0  |
| A. R. Flew & Co. (accepted), .....                                                                                                                                 | 5,168 0 0  |

FULHAM.—For building river-wall and embankment, at Swan Wharf, Fulham Bridge, for Mr. J. W. Bowden. Mr. Alfred C. Bean, engineer, Shepherd's-bush:—

|                                    |            |
|------------------------------------|------------|
| Novell & Robson, .....             | £2,040 0 0 |
| Joseph Mears, .....                | 1,946 0 0  |
| Cooke & Co., .....                 | 1,800 0 0  |
| Williams, Son, & Wallington, ..... | 1,500 0 0  |

\* Accepted.

HAMMERSMITH.—For making up paving, &c., of six roads in the parish of Hammersmith, for the Vestry, Mr. H. Mair, surveyor.

|                                 |            |
|---------------------------------|------------|
| Abdale, Cross, and Welte Roads. |            |
| Kellett, .....                  | £2,472 0 0 |
| Bell, .....                     | 1,998 0 0  |
| Trehearne, .....                | 1,924 0 0  |
| Novell & Robson, .....          | 1,884 0 0  |
| Tomes & Wimpey, .....           | 1,864 0 0  |
| Adams, .....                    | 1,832 0 0  |
| Coat, .....                     | 1,763 0 0  |
| Rogers & Co. (accepted), .....  | 1,680 0 0  |

|                                       |            |
|---------------------------------------|------------|
| Clifton-road and Coleman's-buildings. |            |
| Kellett, .....                        | £2,629 0 0 |
| Bell, .....                           | 744 0 0    |
| Coat, .....                           | 717 0 0    |
| Tomes & Wimpey, .....                 | 673 0 0    |
| Trehearne, .....                      | 669 0 0    |
| Novell & Robson, .....                | 669 0 0    |
| Rogers & Co., .....                   | 663 0 0    |
| Adams (accepted), .....               | 624 0 0    |

|                             |          |
|-----------------------------|----------|
| Argyle-passages.            |          |
| Kellett, .....              | £175 0 0 |
| Bell, .....                 | 143 0 0  |
| Coat, .....                 | 125 0 0  |
| Adams, .....                | 123 0 0  |
| Novell & Robson, .....      | 123 0 0  |
| Rogers & Co., .....         | 113 0 0  |
| Trehearne (accepted), ..... | 105 0 0  |

**HAVEHILL (Suffolk).**—For the erection of New Corn Exchange, for the Board of Directors. Mr. F. Whitmore, architect, Chelmsford:—  
 Everett & Son, Colchester.....£1,473 0 0  
 C. E. Orfar, Colchester.....1,398 0 0  
 Grimwood & Son, Sudbury.....1,365 0 0  
 Mason & Son, Havehill.....1,329 0 0  
 F. Dupont, Colchester.....1,275 0 0  
 A. Dias, Colchester (accepted).....1,250 0 0

**HESWALL (Cheshire).**—For the erection of house, for the Rev. J. Fox. Mr. J. W. Asger, architect, Liverpool:—  
 J. & F. Kitchen.....£840 0 0  
 [No competition.]

**HORNSEY.**—For repairs, &c., at No. 44, Tollington Park, Hornsey. Mr. G. Gordon Stanham, architect, 100B, Queen Victoria-street, E.C.:—  
 Hemson.....£398 18 6  
 Hideman.....352 10 0  
 Desaring & Co.....345 14 0  
 Spencer & Son.....345 0 0

**HURST (Lancashire).**—For the erection of a dwelling-house, Turner-lane, Hurst, for Mr. S. Sidebottom. Mr. J. H. Burton, architect, Ashton-under-Lyne:—  
 Walter Clough, Ashton-under-Lyne.....£445 0 0  
 J. Wharmough, Hurst.....444 10 0  
 J. W. Williams, Ashton-under-Lyne.....438 0 0  
 James Gibson, Dukinfield.....416 0 0  
 William Tickle, Dukinfield.....414 10 0  
 Pitton & Bowness, Ashton-under-Lyne.....414 0 0  
 James Garvie, Ashton-under-Lyne.....411 0 0  
 Charles Morris, Ashton-under-Lyne.....399 0 0  
 Thomas Dean, Ashton-under-Lyne.....385 0 0  
 Allen Holmes, Ashton-under-Lyne.....385 0 0  
 John Robinson, Ashton-under-Lyne.....385 0 0  
 \* Accepted.

**LONDON.**—For shop-fittings, &c., at 239, Upper-street, Islington, for Mr. Hawkey. Mr. J. Farrar, architect, Albion Chambers, Moorgate, E.C.:—

Harris.....£199 0 0  
 Lebb & Oliver.....165 0 0  
 Desaring & Son.....148 0 0  
 Burford.....147 10 0  
 W. Smith.....129 10 0  
 Wolveridge Bros.....118 0 0

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 N. Fearman.....£247 18 0  
 R. D. Lewis & Son.....234 10 0  
 Wootney, Smith & Son.....229 0 0  
 Durrant.....179 0 0

**LONDON.**—For supplying wainscot-panelling and doors in dining-room at 62, Sloane-street, for Mr. Wilson Noble, M.P. Mr. J. A. Stenhouse, architect:—  
 C. Hindley & Sons (accepted).....£185 0 0

**LONDON.**—For paving works at Messrs. Tingle & Jacobs's new premises, Hanbury-street. Mr. R. W. Hobden, architect:—  
 W. H. Wheeler (accepted).....£415 0 0

**LONDON.**—For drain and paving works at Messrs. Spiers & Pout's stables, Charlotte-street, S.E. Mr. Sidney Hargreaves, surveyor:—  
 W. H. Wheeler (accepted).....£148 0 0

**LONDON.**—For rebuilding No. 9, Gough-square, for Messrs. Pardon & Sons. Mr. J. Douglass Mathews, architect, 11, Dowgate-hill, E.C.:—  
 Beuss & Son, Old-street.....£2,197 0 0  
 W. Shepherd, Bermondsey.....2,185 0 0  
 Dove Bros., Islington.....2,145 0 0  
 Downes, Walworth.....2,140 0 0  
 Nightingale, Lambeth.....1,987 0 0  
 Kilby & Gayford, Worship-street.....1,953 0 0  
 \* Accepted, subject to modification.

**LONDON.**—For alterations and additions at the "Three Wheatheaves," Islington, for Mr. R. Rhodes. Mr. J. H. Laurence, architect and surveyor:—  
 E. Spanton (accepted).....£952 0 0

**OSWESTRY.**—For supplying parquet floor for the Victoria Assembly-rooms, Oswestry:—  
 C. Hindley & Sons, London (accepted).....£162 0 0

**PITSEA (Essex).**—For the erection of the "Bull Inn," for Messrs. Crab, Veley, & Co. Mr. F. Whitmore, architect, Chelmsford:—  
 A. Dias, Colchester (accepted).....£820 0 0

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 Hugh Cave, Thorney, Peterborough.....2,045 12 0  
 Redding & Son, Cambridge.....1,850 0 0  
 Blyth & Hunt, Newmarket.....1,917 2 6  
 Kent & Holland, Newmarket.....1,916 0 0  
 Richard Arber, Newmarket.....1,864 0 0  
 Plummer, Rattlesden, &.....1,788 0 0  
 Hook, South, Newmarket.....1,694 0 0  
 Harry S. Linsell, Newmarket.....1,694 0 0  
 H. C. Coulson, Cambridge.....1,665 0 0  
 P. Bayard, Cambridge.....1,602 10 0  
 Cowell & Son, Soham.....1,552 0 0  
 Charles Kidman, Cambridge.....1,428 0 6  
 \* Accepted.

**READING.**—For the erection of two detached houses in Berkeley-avenue, Reading, for Mr. J. B. Monck. Messrs. Cooper & Son, architects, Blagrove-street, Reading:—

Quantities by the architects:—  
 Ruffell Bros.....£980 0 0  
 Winter & Fitt.....857 0 0  
 John Bottrill & Son, South Shields.....855 0 0  
 Thos. Pilgrim.....860 0 0  
 Geo. Lewis.....845 0 0  
 Collier & Catley.....809 0 0  
 W. Goodchild.....749 0 0  
 W. Potley.....710 0 0  
 [All of Reading.]

**READING.**—For laying main sewer and constructing manholes in Berkeley-avenue, Coley, for Mr. J. Bligh Monck. Messrs. Cooper & Son, architects and surveyors, Reading:—  
 Collier & Catley, Reading (accepted).....£255 0 0

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 Middlemiss Bros., Newcastle.....16,472 0 0  
 James Young, Tyndcock.....15,585 0 0  
 Wm. Scott, South Shields.....15,381 0 0  
 John Vinton, South Shields.....15,465 0 0  
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 R. Summerville, Tyndcock.....15,267 0 0  
 D. & J. Ranken, Sunderland.....15,235 0 0  
 Thos. Fortune, North Sunderland.....15,212 0 0  
 Peter Marshall, South Shields.....15,136 0 0  
 J. B. Weir, South Shields.....14,949 0 0  
 J. & W. Lowry, Newcastle.....14,709 0 0  
 D. Laven & Company, South Shields.....14,595 0 0  
 Thos. Lumsden, Jarrow.....14,459 0 0  
 Kibbarn Bros., South Shields.....14,247 0 0  
 W. Scott & Son, Sunderland.....13,980 0 0  
 E. Anderson, South Shields.....13,846 0 0  
 Jos. Elliott, North Shields.....13,840 0 0  
 Robt. Allison, Whitburn.....12,994 0 0  
 Thos. Figg, South Shields.....11,710 0 0  
 \* Accepted.

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 H. Pickersgill & Smith, Loughboro' Junction.....1,793 0 0  
 R. M. Priestley & Co., Camberwell.....1,775 0 0  
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 Mattock Bros.....1,240 0 0  
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 Geo. Shears.....1,120 0 0  
 H. Ingram.....1,080 0 0  
 Howe & White.....1,060 0 0  
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# The Builder.

Vol. LV. No. 232.

SATURDAY, SEPTEMBER 29, 1888.

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### Some Sanitary Reports.



RECENT number of the *Journal of the Society of Arts* contains the report in full of Mr. Chadwick's Presidential Address to the Association of Sanitary Inspectors of Great Britain,

read at Brighton on the 25th of last month, and to which reference has already been made in our columns. The lesson read by the veteran sanitarian in this address is one which he has been delivering all his life, and which he still keeps persistently ringing upon a generation which has profited, doubtless, by the preaching of himself and other devoted sanitarians, but which is far short of the mark, if not in regard to every belief, at least in regard to sanitary practice. Two points strike us especially in Chadwick's address as affording remarkable and dramatic examples of the moral and physical effect of sanitary conditions upon human life and character, for evil or for good. One is the incident which he mentions of his conversation with a respectable member of the poorer classes in Edinburgh, a porter earning 20s. a week, and who had to the sanitary apostle the details of his expenditure, resulting in an admission of one half of it went on whisky. In answer to a remonstrance, the reply was, "Well, sir, this is the only place I could get; if you were to live here you would drink whisky too." "It so happened," adds Mr. Chadwick, "that whilst I was there I did get a coppersy taste in my mouth, a premonitory symptom from so depressing an atmosphere, and immediately I left it, it is a fact that, rightly or wrongly, I sought for a more healthful and diffusive stimulant—some brandy and water." So much for the moralising effect of insanitary habitations. Equally striking, but pleasanter, testimony is the importance of sanitation,—“a more under instance,”—is found on the next page of the same address. The speaker, in visiting a neighbourhood where he had not been for some years, was much struck with the appearance of the children, as less pallid and without the “dull leathery look” that he used to see. And he observed to the father, “You must have got a new class of children since my last visit.” No, was

the answer, but “since the sanitary improvements had been made in the lower districts,” the children received from them had the improved type which had struck the visitor. Premises had been drained, rooms ventilated, washing promoted, and the death-rate reduced to one-fourth of what it had formerly been, and that with children of the lowest class, with the physical and moral results written on their faces and manners.

This is an old story, it may be said; but it is one which cannot be let go even yet. Great is the progress that has been made in public opinion and in practical reform during the last quarter of a century; but those who keep their eyes about them are continually reminded how much there is yet to be done.

Among such reminders are the various “Reports” which reach us from time to time, made to the Local Government Board by medical officers, in regard to the sanitary state of this or that village or township, and the probable causes of the prevalence of enteric fever and other epidemics in such localities. The facts stated and the conclusions arrived at in these official reports are worthy of more public attention than they usually receive. We have before us all that we have received since the commencement of the present year, and they contain some instructive reading.

The largest and, in other respects, the most important of these, and also the earliest in date of our collection, is the joint report made to the Local Government Board by Dr. Barry and Mr. P. Gordon Smith, in February of this year, on the subject of back-to-back houses. So long and so decisively has this method of building houses been condemned by sanitarians, that it may come as a surprise to many to know that there are whole districts, including towns of such importance as Leeds and Halifax, where not only are back-to-back houses permitted, but there is a system of local legislation for them, and a decided tendency on the part not only of the builders but the occupiers of them, to prefer them to “through houses.” The preference of the speculating builder for them is, of course, on the ground of economy of building; but the statistics given by Dr. Barry and Mr. Smith go to show that this economy is of the barest character, often only representing one penny in the week of rent. The statistics on this subject are given very fully and precisely, in well-arranged tables of outlay, area, and return, which should form powerful arguments in the hand of the right-minded sanitarian,

showing for how poor a return this injury to public health is perpetrated. To the statistics of injury to health we will come just now. The preference with which the back-to-back houses are apparently regarded by a certain proportion of the occupiers arises from a persuasion that they are “more comfortable” than “through houses”; on the principle, we presume, enunciated in the proverb of the Scotch lower orders, quoted in “The Antiquary”:—“The clartier” the cosier,”—a sentiment equally acted on in England, if not so frankly proclaimed. Who has not experienced the difficulty of persuading persons of the lowest rank to keep windows open in their houses, and the certainty with which they will, if possible, stop up all ventilators which a paternal landlord may have established for their welfare? To such persons a good stuffy back-to-back house, where all the windows are one side only, and where no breath of fresh air can invade them from the other side, is a paradise, from which only a stern and inexorable legislation,—a sword of the law which turns every way,—can eject them.

The Report deals entirely with certain towns in Yorkshire. Whether this district was selected as being one specially in need of criticism, or for other reasons, we do not learn from the report. The statistics given are under the heads of (1) extent to which back-to-back houses have been built recently; (2) space about dwellings, and density in regard to area; (3) structural arrangements, ventilation, disposal of refuse, &c.; (4) relative cost of houses of different classes; and (5) influence of different classes of houses upon health and morality. The statistics under the first head will astonish the London reader. In Halifax, in the years 1876 to 1886, 61 per cent. of the houses built were on the back-to-back plan! In Morley, where by-laws allowing of the erection of such houses have been in force since 1883, 82 per cent. have been built so, and the proportion is increasing. In Leeds, during the twelve years ending August, 1887, about 50,000 persons are estimated to have been living in back-to-back houses; and in Bradford, during 1876 to 1886, out of a total of 7,036 new houses certified in Bradford as fit for habitation, 64 per cent. were built on the back-to-back plan, inhabited by about 20,000 persons. We ought to be very much indebted to Dr. Barry and Mr. Gordon Smith for

*I.e., “dirtier.”*



Investigating and tabulating these facts, which to many will seem almost incredible. It only shows how slow is the progress in these matters, that years after the best sanitary authorities have condemned such houses completely,—after the condemnation of them has really become quite a commonplace,—there are large provincial towns building them wholesale, and even passing by-laws to permit and to regulate their construction. This latter fact is almost the worst part of the matter. It would look better if such building were the result of mere evasion of the law, or carelessness in the administration of it, than that the law should deliberately license it. In Halifax it appears, indeed, that the town authorities almost revel in back-to-back houses, and that while the by-laws specify certain restrictions, the practice is to relax them. The by-laws contemplate that back-to-back houses should be limited to blocks of eight houses, four each way, with 15 ft. clear space between them and the next block, and that this rule should not be departed from “unless with the previous consent of the Corporation.” This dispensing power of the Corporation seems, however, to have been so freely exercised that the authors of the Report are able to exhibit block plans of back-to-back houses in blocks of 16, 28, and 30 houses respectively, and a block of no less than 20 “single” houses, as they are called, *i.e.*, houses with only a dead wall at the back, and no through ventilation.

At Keighley, which is another of the back-to-back towns, as we may call them, it appears that the building of such houses is limited, in by-law and in fact, to blocks of four tenements, and there is a certain practical character in the way in which the system is carried out there. The four houses are within the four arms of a cross formed by the party-walls, and while the window of each living room looks, we will say, to east or west, the window of each scullery or of the smaller bedroom above looks to north or south; so that there is at least a cross-corner ventilation. This practice (usual, it appears, though not always enforced) does away with some of the evil of the back-to-back system, and the builder of the houses “makes his economies,” as the French would put it, without rendering each house a complete *cul-de-sac* of fouled air; so that in as far as this, Keighley is in advance of her larger neighbours among the Yorkshire towns.

The manner in which the effort to save, which is the sole excuse for this method of building, is carried on in many cases, is worth special note, and we may transcribe it here as given in the Report:—

“In the case of a row of through houses, every house, except the two end houses, will be concerned with two party walls and two external walls; but in the case of a row of back-to-back houses, each house, other than the four end ones, will be concerned with three party walls, and only one external wall. Hence, any saving that can be effected in the construction of the party walls of new buildings will produce a larger saving in the case of back-to-back houses than of through houses. This particular item of saving of cost has, we think, tended considerably to create the impression that back-to-back houses are cheaper of construction, and can, therefore, be let at lower rents than through houses affording the same amount of accommodation. There is, accordingly, a tendency in certain places to construct party walls only half a brick (4½ in.) in thickness, and to carry them up no higher than is absolutely necessary to separate the rooms in one house from the rooms in the next house, *i.e.*, up to the ceiling-joints of the top story, so that in a row of houses the space in the roof above the ceilings of the top story of the houses is continuous from one end of the row to the other. For similar reasons of economy the timbers of the several floors, and certain timbers of the roof, are frequently built into the party walls in such a way that the ends of joists and roof timbers, inserted on opposite sides of the same wall, are in close proximity to, if not in actual contact with, each other. Now, a brick party wall only 4½ in. thick cannot be regarded as affording reasonable safety against the spread of fire, and still less can any party wall be so regarded if it be incomplete in height, or if it in any way allow the timbers of floors and roofs to be continuous from one house to the next. Nor, indeed, can such party walls be regarded as sufficient for purposes of health, since, owing to incompleteness, the atmosphere of one house would be common to the other

houses in the same row, a condition which could scarcely fail to be a source of danger in the case of any infectious disease; and yet it is by no means uncommon to find the party walls in rows of houses incomplete, being stopped short at the ceiling-joints of the top story, sometimes only 4½ in. thick, and very frequently with continuous timber through the party wall from one house to the next.”

As if this were not enough, the arrangement of the privies in connexion with many of these houses is open to the gravest objection. In some cases, privies common to two or three houses are so placed as to be thirty or forty yards from some of the houses using them; in others they are against the very walls of the house itself.

The important point of such a report is, of course, when we come to the inquiry as to the effect of back-to-back houses on the health of the occupants. Common sense would lead most people to the conclusion that such houses cannot be so healthy as those with through ventilation; even the local authorities who permit this manner of building must be aware of this to a certain extent; but there is probably a vague idea that the ill-effects are over-rated, and that they will not show themselves in any decided or tangible form. That is the feeling which has been at the bottom of a great deal of the indifference and reluctance to undertake improvements which have retarded the sanitary advance of many places. People say, “Oh, we believe the statements about the disease and mortality resulting from these causes are greatly exaggerated”; and this belief suits so well with vested interests and official indolence that it is easily accepted. It is here that the almost unanswerable argument of statistics comes in with such effect. In regard to the districts specially dealt with in this report, the authors state that the data for such statistics are as yet wanting. They found in all the districts they visited a general opinion among the medical officers of health as to the unhealthiness of the back-to-back houses, but no systematic study and co-ordination of the facts seemed to have been made, such as would form the basis of a statistical statement. Since the inquiry was commenced, a resolution was passed in the Public Health Section of the British Medical Association, at their Dublin meeting, condemning the erection of back-to-back houses, but even on that occasion no definite evidence was adduced in support of the resolution. But the authors of the report were fortunate enough to obtain some definite statistics from another district, Salford, where Dr. Tatham, the Medical Officer of Health, had for some time been compiling statistics of the mortality and the conditions of building within the 208 districts of enumeration of the last census. From his information the authors have been able to supply some diagrams of mortality in the registration districts of Salford. In the first one taken, there are three districts, tabled thus:—

I. No back-to-back houses.

II. 18 per cent. ditto.

III. 50 per cent. ditto.

and two sets of graphic representations are given of the rates of mortality in these three groups of houses. The first set shows epidemic diseases, phthisis, and pulmonary diseases other than phthisis; the second set shows diarrhoea death-rates. In the first diagram the difference between the death-rates in column I. and column III. is sufficiently marked; it is as 26 to 37; but the difference is much more marked in the diarrhoea diagram, where it is as 155 to 28. The next table, from another district, presents a still more striking result, as it includes a fourth district, where the houses are all back-to-back. In this case the proportion of diarrhoea death-rate in the district (I.) where there are no back-to-back houses, and in that (IV.) where they are all back-to-back, is as 14 to 33. The authors admit that from the circumstance of the statistics being limited to one town, and there being no data as to the ages at death, too much stress must not be laid on the figures given; but the result, even in the rough, seems too marked to be passed over lightly, even allowing a certain margin for inaccuracies. The moral

of the matter is that, while a district of our large towns furnishes these results as to the effect of back-to-back house-building, other large towns are building more than half the number of new houses in the same manner.

Another important and very full report of the same kind is that furnished to the Local Government Board by Mr. John Spear, dated July 3, on an epidemic of enteric fever in the Mountain Ash Urban Sanitary District, Glamorganshire. This report was undertaken to trace the causes of epidemics in 1886 and 1887, and two plans of the district are given showing the blocks of houses in the contiguous hamlets of Mountain Ash and Miskin. These plans appear to bring out the relation between cause and effect in an almost startling manner. Houses infected are marked with red dots, and blocks of houses supplied with water from a particular main, the “Oxford-street main,” running through Mountain Ash and on to Miskin, are coloured grey to distinguish them from the rest. With one or two exceptions in the second map, the red dots are all on the grey-tinted blocks of houses. The report is too long to go into in detail here, but the facts, as Mr. Spear says, show that the water passing through the Oxford-street main must have been, at various periods, contaminated with the specific poison of enteric fever. The precise manner in which this occurred has not been made out, but some facts are given which seem to show that the periodical intermission of the flow of water through this portion of the main, which was arranged to be shut off at intervals, gave at all events the opportunity for the formation of low forms of life in water stagnating in portions of the main, and also for leakage into the main through defective joints, of some contamination from the soil around. We extract two or three of the most suggestive passages from the report. We may note that the infected district commenced (in Mountain Ash) at the point below a junction of the previously mentioned main with the “Henry-street main”:—

“The Oxford-street and Henry-street mains are so related that any air-borne matter gaining access to either of them during intermission of water supply would probably be carried back some distance by the aspiratory action of the other, to this point of their bifurcation. Indeed, for some years below that point, water will flow back from the Oxford-street into the Henry-street pipe, a fact that is made use of when it is desired to empty the former quickly.

For the purposes of this inquiry the two pipes were some distance above and for some distance below the point indicated. The Henry-street pipe was laid some twenty-five years ago, and has been found to be much corroded. That of Oxford-street was relaid, as I have said, in 1885. There is no doubt that the relaying was very carelessly, not to say recklessly, done. Owing to the exigencies of war-work, it was done at night, and the workmen being in private houses, was subject to no supervision on the part of any official or authority having concern with the public health. Accordingly, the main was carried, without any special precaution, immediately above, alongside, and through old rubble drains; and when in the course of the trenching pipe-drains were cut through, as trouble appears to have been taken to replace them. I find the Inspector of Nuisances reporting in September, 1885, a third case of injury and stoppage of a drain from this cause.

Although the old stone culverts to which I have referred are not ostensibly sewage carriers now, they formed the sole sewage system some twenty years ago; and even now refuse matters are often poured, as I saw myself, into the roadside gullies that are connected with them. One of the culverts through which the Oxford-street main was carried (a “collar” or junction between two pipes being in the interior, section A.) was found to contain a quantity of excessively foul sewage deposits, and considerable was the suction of air into the pipes at certain points after intermission of supply, and, on its renewal, how much air, coming with much noise and force, had to be expelled. No special valves being provided for the purpose, this air must have entered by accidental openings. In May, 1887, the usual summer intermission of supply at night commenced, and on July 7, owing to scarcity of water, the service was restricted to eight hours daily. For the same reason the pipes at this time received no proper flushing, and the evidence of the



sumers leave no doubt that they became very ill. . . . At any time of intermission it is in that the leaky water-pipes were at liberty to charge their contents through any opening at lower level, and that they would convey, not only water as remained in them, but those matters which entered at the points of leakage; in short, the leaky pipes would act as so many means draining the ground in which they were placed. . . . passing through or over old rubble culverts, they would take up foul air and liquid from these vents and from the soil around, and would deliver these matters at lower levels (if not during intermission, on the first renewal of supply) for consumption as 'drinking water.' . . . Chemical analysis of the water, and still more microscopical examination, afford important confirmatory results. . . . Dugré, to whom samples were sent for analysis, reports that water taken from a house-tap in Henry-street, before the nightly intermission of service, was re; while that from the same tap after intermission gives evidence of animal contamination and the appearance of low forms of life."

No facts could more strongly emphasise the necessity for scrupulous care in the laying of water service pipes. Here it is shown that an area of disease was almost precisely continuous with the area of water supply furnished under the conditions so graphically described in the report; and this first necessary of life, instead of the water of Life, came the water of Death.

Among the other reports to the Local Government Board on the sanitary condition of provincial towns and districts, we have Mr. Page's report on the adjoining Urban Sanitary Districts of Clew-with-Weelsby and Great Grimsby, with reference to the prevalence of enteric fever. Here the drainage seems to have been the source of evil. In Clew-with-Weelsby, we read:—

"In some houses with in-door sinks, the pipe was found to communicate directly with the drains, and a small belltrap was found displaced, allowing, as experiments showed, steady draught of foul air to the dwelling. The yard sinks are, almost without exception, of faulty construction, and consist of a large catchpit, locally and inappropriately named a cesspool, constructed commonly of brick, and trapped either by a vertical flagstone or some iron trap. In the latter instance there is nothing to prevent the escape of sewer air to the yard, and this, in effect, was found in such places, as might be expected under such conditions. These catchpits hold several feet of slop-water, and more or less of solid matters, and are emptied at the instance of the authority, who contract with a person to effect this emptying at intervals of three months. Water-closet soil-pipes are inadequately ventilated by 4-in. pipes, instead of being carried up in full measure as required by the bye-laws; and similarly the proper ventilation of house-drains, as required by the bye-laws in no instance carried out. rain-water pipes being in general use for this purpose. So that, in effect, it may be said that under existing circumstances of sewer ventilation throughout the district the only valid means of exit for sewer air has been on and about house premises."

When we come to Great Grimsby things are no better:—

"The sewers are without adequate means of ventilation or provision for flushing, although both outfalls are blocked at every tide for some five or six hours, or even longer. During this interval the sewage is stagnant in the sewers, and the chief valuable means of escape for the foul air is by rain-water pipes and the defective traps of sinks and catchpits on house premises over the town."

So we go on with the same story, with variations, in one report after another. We next take up Dr. Parsons's report on an outbreak of enteric fever in the borough of Buckingham—"Old cottages, badly built, ill-ventilated and dilapidated"; "no bye-laws for the regulation of new buildings," &c.

"The sewage of Buckingham is drained into the Duse, . . . to the day in which the river encircles the town, so that no part is very far distant from it, the outfalls are numerous, and the individual sewers are for the most part not of very great length. The course and construction of the sewers are imperfectly known, as they have been constructed at various periods, and no plans of them have been kept; but one is known to show that they are very defective. Those constructed in the last ten or twelve years are of socket-pipes, but some of the older ones are brick culverts, or square stone drains with bare earth bottom and irregular fall. There are catchpits in their course 3 ft. deep below the invert of the sewer to retain the grosser sediment. Private cesspools, with or without overflow into the sewers, also exist in the town. The sewers have no means of ventilation other than such inlets as may have been left

untrapped, and which are often too near houses. Nor have they any regular means of flushing, the only means being to pump water into them from the river with a fire-engine. It is said that when this was recently done none of the main sewers were found blocked, though some contained 4 or 5 in. of sediment, but many of the house-drains were quite blocked up."

Water-closets have been partially introduced; hopper-closets flushed by hand from buckets; often (can we be surprised?) in "a very unsatisfactory condition." The water supply is mostly derived from pumps and wells, but as the town is nearly cut off by the river valley from any large extra-urban gathering ground, the water which the wells yield must be largely derived from the rain which has fallen upon the area of the town, and which would carry with it impurities from the surface, and from leaky drains, cesspools, &c.; little care is taken to make the wells watertight, and how porous the soil may be inferred from the following delightful extract:—

"At a house in the centre of the town, the water-closet drains into a cesspool, the overflow of which goes into a second cesspool. The first cesspool is emptied every year, but the occupier of the house told me that the second cesspool had not required emptying during the twenty-five years that he had resided there."

There is a kind of grim humour about this statement as to the soil from which much of the drinking-water of the neighbourhood is drawn. Then we have Dr. Parsons's report on the high rate of mortality in Dolgelly, in which there is some variation from the usual type of complaint. Here it is indicated that houses are so flimsily built as to be hardly weatherproof: roofs unceiled; "hence the bedrooms must be as cold in winter as they were hot and close at the time of my visit" (report dated July 7). The following is a description of a bit of Dolgelly property:—

"Chapel Buildings.—An old chapel has been converted into eight dwelling-houses, of which six are entered from an open vestibule on the ground-floor, and two upstairs. One or two of the rooms are without light or ventilation, but most of the houses would have fair through ventilation were it not that the windows at the back of the block look out on to a tanyard, and have frequently to be kept closed to prevent the bad smells therefrom from entering the house. The water-closets are under the staircase in the vestibule, and are without light or air; there are two seats, not partitioned off one from the other, but one only is in use; of the other the pan has been broken away, but the water-service remains, and is used to fill vessels at, the water-supply to the tap having been cut off. In this block of property, including a front row, the density of population is at the rate of about 425 per acre."

By-laws have been made, founded on those of the Local Government Board, "but they are entirely disregarded"; plans of new buildings are submitted, as a matter of form, to the local authority, but no one takes the responsibility of seeing that the provisions nominally made are complied with; and it is Dr. Parsons's statement that they are an absolute dead-letter. This non-enforcement of the law he believes to be due to the disinclination, often found in small places, to appear disobliging to a neighbour, "especially one who may have influential friends on the Board." The remedy for this is to give more power and independence to the Medical Officer of Health, as has been repeatedly urged both by ourselves and by correspondents in our columns.

The Report made by Messrs. D. Cubitt Nicholls and Shirley F. Murphy to the Home Secretary on the immediate sanitary requirements of the parish of St. Matthew, Bethnal-green (dated March 17), is of a rather different order, and dwells more on the evil consequences of neglect and dilapidation in buildings. "The condition which above all others characterises dwelling-houses in Bethnal-green is the dilapidated state in which they are allowed to remain. In street after street houses defective in this respect were abundantly found in the course of our inspection. Such houses showed badly-paved yards, defective roofs, broken floors, dirty walls and ceilings, broken plaster, dilapidated window-frames, together with faulty gutters and defective pointing of walls, giving facilities for damp to enter." Newly-erected houses

are free from the faults of many of those which preceded them; but the authors note serious objections to two new blocks of "Model" lodging-houses:—"In one [Queen's-buildings] the water-closets were placed in the sculleries, without direct light or ventilation; in the other [Quinn's-square], from the great height of the buildings abutting on narrow courts, the lower rooms were so deficient in light as to detract from their healthiness." This latter mistake is one which applies to a great deal of building in the West of London, as well as to many of the "Model" blocks of workmen's homes in the East. It is odd that the very authorities who object to overcrowding on a horizontal area cannot see that overcrowding vertically comes in the end to the same thing, and that the provision for a width of street which is adequate for houses 30 ft. high cannot be adequate for houses 60 ft. or 80 ft. high. Unless those who are responsible for the erection of these lofty buildings on too confined a site bring their common-sense to bear on the matter, they will, before long, be taught by the death-rate, that stern monitor in regard to mistakes in building.

We have but touched on a few of the points in these mostly able and interesting reports; enough to show that they form a class of literature deserving of public attention, and proving, in spite of the unquestionable and remarkable progress made in the last quarter of a century, how much still remains to be accomplished in improving the sanitary conditions of life in towns and urban districts.

#### NOTES.

THE new Court Theatre, which has been opened this week, is, in its plan and arrangement, to a great extent a repetition of Terry's Theatre, by the same architect, though the exterior architectural treatment is of a different type. The same system of fire-proof construction in the auditorium has been carried out, as well as the provision of a large number of extra exit-stairs with doors opening on a push from the inside; in this case the push is taken by horizontal brass rails standing out from the surface of the door, so that any crowding against the door must necessarily operate on the opening-gear. The stairs, both the ordinary ones and extra exit stairs, are spacious in comparison with the numbers to be accommodated in the house, and probably as well arranged as they can be within the narrow limits of the site, which, of course, impose considerable difficulty on the architect. The pit entrance-stair is not a very good one, having two turns at right angles and a rather long and steep flight downwards between the turns. There was a disagreeable crush here on the opening night, we believe, the people having been admitted to the bottom of the stair before the doors were opened; means have been taken now of controlling them better by a strong barrier at the top of the stairs; but this part of the entrance arrangement cannot be considered quite satisfactory, nor do we see the necessity or advantage, as this is not a sloping site, of taking the level of the pit and stalls so far below the ground; it has the effect of lessening the climb to the gallery and upper boxes, and the distance of the exit from there in case of alarm, no doubt; but we are not much in favour of putting a theatre down into a hole in the ground, where no special features of the site render it unavoidable. The stage is cut off from the auditorium by an asbestos curtain, in this case double, with a space between; and the curtain can, in the event of sudden danger, be dropped instantaneously, though provided with a break for ordinary lowering. Sprinklers are in use on the stage, not automatic, but placed where they can all be operated in a moment; and we have much more faith in hand-gear for this purpose than in automatic gear, which we should expect to find fail just when it was wanted. In its practical planning and construction this is an admirable theatre of its size, and Mr. Emden may be congratulated on having achieved a distinct step in theatre-building,—



the result of having given his mind to satisfying a special requirement of the day. For the architectural characteristics of the house we fear much cannot be said. The decoration is not better than theatre decoration usually is; and the large vases, and the *fronton* (we borrow a French word for what we have no precise English one for), with nothing behind it, which forms the centre feature of the sky-line of the facade, belong to the most commonplace order of architectural accessories. The worst point architecturally is the manner in which the drum of the octagonal dome over the centre part of the auditorium hangs in the air in front of the gallery; nothing could look more unarchitectural and un-constructive; and in his next theatre Mr. Emden should endeavour to improve upon this method of designing the interior.\*

A CORRESPONDENT of the *Times* draws attention to a significant extract from the *Ormskirk Parish Church Magazine*, as follows:—

"The parishioners will be glad to know the destination of the old oak benches. They are being sent to a school of art in Boston, U.S.A. A gentleman has bought them for the purpose, and the vicar and wardens have received the sum of \$60. for them, which amount is lodged in the bank to the credit of the Restoration Fund. We retain a few of the old seats in the church."

The idea that the benches that were taken out of an English parish church, as not good enough for the restored edifice, should be purchased by a School of Art in the new world, has an amusing irony about it; but the present taste of the Americans for relics of Queen Anne and Georgian work is, after all, a good deal of the nature of a fashion, which will probably have its day and pass away. It is natural that it should be much developed in and around Boston, where there is a good deal of what is practically actual English work of the period in existence. However some persons may regret this destination of the discarded woodwork in our restored churches, there is something to be thankful for in the above announcement, if we compare it with the following, which is from an old number of the *Ecologist*:—

"The following scandalous advertisement has been sent us from a provincial paper:—Workshop Church. To Builders, Masons, Collectors of old carved oak, and others.—To be sold by auction, by Mr. R. A. Penson, opposite the parish church of Workshop, in the County of Nottingham, on Thursday, September 2nd, 1847, a quantity of very valuable old oak timber in beams, rafters, planks, and useful scantlings, together with the stall-ends, panels, and beautiful antique carved work. The whole of which have been removed from the interior of Workshop Church during the restoration of that ancient edifice, and will be offered in suitable lots for the convenience of purchasers."

It would seem that, in spite of the outcries of the antiquaries, we have really made some progress in respect for old work during the last forty years.

IT will probably not be till after the lapse of many years that the "Corpus" of Greek grave-reliefs, projected by the Vienna Academy, will be complete. Meanwhile, from time to time, monographs appear on special points under discussion, and these monographs are based on the material already accumulated for the Corpus. Dr. Alfred Brückner, in his "Von den Griechischen Grab-reliefs" raises anew a question which we noted in detail some time past in connexion with Dr. Furtwängler's introductory essay to the Sabouroff collection,—i.e., whether the scenes on Greek grave-reliefs, where two figures join hands represent a parting before death, or a meeting after death? Dr. Furtwängler, with

much ingenuity and learning, maintained the meeting theory, Dr. Brückner that of parting. He certainly brings a great deal of cogent evidence, and much that is new since Dr. Furtwängler wrote. Specially he brings forward instances of grave lekythoi, in which in two vases the same people appear in the one case as living subordinate spectators, in the second, as dead and principal actors. He also notes and publishes for the first time an interesting relief from a private collection in the Peiræus in which a boy and girl hold hands in the familiar "farewell" scheme. We believe it is the only instance in which children are so represented. Over the head of the boy, in whose memory the relief is made, is his name. Over the girl's head there is nothing. A frequent theory in instances of this sort is that the second unsigned figure is there "by anticipation." In the case of a child this theory is inadmissible, as no parents would be likely to make so gloomy and ill-omened a forecast. Dr. Brückner's pamphlet is a reprint from the "Transactions of the Academy of Sciences." Vol. 116., 1888.

A RATHER odd species of sculptural decoration seems in process of being added to the attractions of Cardiff Castle. On a boundary wall which has been erected in front of one of the approaches to the Castle certain spaces are to be decorated with carvings of animals by Mr. Nicholls, two of which have already been fixed, a seal, and a baboon, the seal with its head and shoulders rising over the coping. Other forms of animal life are to follow. This idea in itself is quite in keeping with the spirit in which Burges carried out the new buildings at Cardiff. What we do not like is to hear that the figures are painted in natural colours. If so (and we so understand the description given in the *Western Mail*) this is a great mistake in regard to artistic feeling and effect, and would reduce the thing to a piece of rather childish realism, quite out of keeping with the true spirit of architectural decoration.

MR. THOS. P. WORTHINGTON, of Blackpool, submits to our notice a proposal to ventilate sewers by gas-burners along the edge of the footways of streets, supported on standards, to the foot of which pipes would be laid from the sewer, and the sewer-air would be conducted to the gas-burners at about the height of ordinary street-lamps. In the sheet of drawings accompanying the prospectus of the invention a view of a street is given, from which it would appear that the distance apart of these ventilators would be about the same as that of the street-lamps; indeed, it would almost seem that the ordinary street-lamps are intended to be used for the purpose, although that is not specifically stated. The sewer-air, then, being conducted through these standards, is proposed to be "cremated" by the gas-flame; but, on its way, it is to pass through a chamber containing pans holding disinfectants. In this proposal everything depends upon the efficiency of the means of disinfection in the chambers, and in its proper maintenance at all times; and it may reasonably be inferred that sanitary authorities would find the renewal of the disinfectants from time to time, and sufficiently often, a little burdensome, and the whole arrangement might be thrown out of order on that account. As to the air being "cremated" by some of it coming in contact with a gas-flame, the expectation is unreasonable.

THE North-Eastern Sanitary Association, which has its headquarters at Newcastle-on-Tyne, with branches at Sunderland, Durham, Stockton, and Middlesbrough, has recently issued a report, chemical and bacteriological, on the air of twenty-six buildings in Newcastle, prepared for it by Professor Bedson, of the Durham College of Science, Newcastle; Mr. Lovibond, F.I.C., F.C.S.; and Mr. Severn, of the Normal School of Science, Newcastle. As an instance of how

to do a thing when you have a mind to do it, this call for a report by a Sanitary Association is worthy of note. Sanitary Associations do not sufficiently declare the principles upon which their practice is based.

WE hear of a scheme for a high-level bridge over the North Sea Canal at Amsterdam which has the merit of novelty. The proposition is to erect two lofty towers supporting a high-level bridge, and with a spiral roadway round each, up which carts and carriages can pass and cross the high-level road at the top. The scheme does not sound very practical. To get headway for the several tiers of road, along with a conveniently practicable gradient, would require towers of rather portentous scale. They would afford, however, considerable opportunities for architectural effect, if properly treated.

A CORRESPONDENT writes:—"One of the first acts of the Metropolitan Board of Works, after the Victoria Park at Hackney has passed into its control, has been to remove the podium of the handsome drinking fountain, erected in 1862 at great cost, at the expense of Miss (now the Baroness) Burdett Coutts from the design of Mr. Darbishire, architect. The building being octagonal on plan, eight flights of steps, one on each face, were recessed into the podium. It is now intended to continue the steps uninterrupted all round. It would be interesting to know whether the consent of the munificent donor has been obtained before making this considerable alteration, and whether the architect has been consulted." An engraving of the fountain will be found in the *Builder* for May 11, 1861, with a plan and section. It will be seen that in the original design the large mass of the podium between each flight of steps was an important feature in the proportion of the whole. The ornamental vases which occupied each projection of the podium are not, we must confess, a form of architectural decoration of which we are much enamoured, unless they were put to a legitimate use to contain flowers or shrubs; and we do not know that in itself a continuous flight of steps is not a better idea. But the mere continuation of the existing section of the steps would probably be unsatisfactory, as it would not give an adequate base to the structure; it would require more spread of the steps and a wider platform at the top to compensate for the loss of the projecting podium at the angles, and to avoid injury to the balance of the design. This is an important point, and we join with our correspondent in the query as to whether the architect has been consulted; he ought to have been.

IN reference to our remarks about the insanitary structure of many of the houses in the Isle of Man, the *Isle of Man Examiner* prints a letter containing a statement from a local medical man, that to the best of his knowledge there has not been a case of "diphtheria" (sic) in Port St. Mary for many years. We believe the fact is that the case we referred to was parochially just outside the Port St. Mary boundary, so that it is only an error in form; but the important point of our comment was that if there were such cases, it was not to be wondered at, considering the insanitary condition or planning of many of the houses in the neighbourhood.

University College.—The classes of architecture, construction, and practice are about to be resumed, and Professor Roger Smith announces as the subject of the free public lecture with which he habitually begins the session, "Mistakes in Architecture." He proposes to notice both students' mistakes and architects' mistakes. This lecture will be given on Thursday evening, the 4th October, at 7.30 p.m. at the College.

Competition: Infant School, Ardwick.—In a limited competition, the design by Messrs. Smith, Woodhouse, & Willoughby, of Manchester, for the Lyon-street Infant School, Ardwick, was accepted. The building will be erected for the Manchester School Board.

\* We may add that Messrs. Holliday & Greenwood were the contractors; the carton-pierre decoration of the interior has been executed by Messrs. Highway, Kneel, & Dwyer, as has also the mosaic work. Messrs. Wilkes have done the Eureka concrete staircases; Messrs. Sharp & Kent, the electric lighting; Messrs. Vaughan & Brown, the stage gas-lighting; Messrs. Stakin, Gardner, & Co., the gas and electric fittings; Messrs. Lazarus, the seats. Mr. Geo. Harrison, C.E., has acted as engineer for the fire appliances, which have been carried out by Messrs. Barker & Co. Mr. Hurrell was the general foreman of the works; and Mr. S. H. Egan has acted as clerk of works.



## THE INTERNATIONAL GEOLOGICAL CONGRESS.

THE fourth triennial meeting of the International Geological Congress was held last week at the London University, Burlington Gardens, when a large number of geologists from all parts of the world assembled to discuss various problems of international importance to the science. The first meeting of the Congress was held in 1878 in Paris; the second in 1881 at Bologna; and the third in 1885 at Berlin. All the meetings have been successful, the present one has drawn together a very large number, especially of the more useful geologists, than any of its predecessors. The Congress is international not only in name but in nature, delegates from nearly every civilised country in the world having attended. It is of great importance to geologists, as to all other scientists, to have uniformity in nomenclature, and the present Congress has been largely occupied in settling boundary lines and terminology. How it has succeeded we hope to show in the sequel.

The first meeting was held on Monday evening, the 17th, when the President, Professor J. Prestwich, M.A., F.R.S., read the opening address, which, like nearly all the speeches and publications of the Congress, was in the French language. It consisted of a tolerably comprehensive résumé of the results of the previous Congresses, and also indicated the lines upon which the work of the week would be conducted. He said that at the Paris Congress it was suggested that the three (so-called) primary colours—red, blue, and yellow—should be universally adopted in colouring geological maps, as representing the three great rock groups—Primary, Secondary, and Tertiary; various tints of the colours, and *hachures*, being employed to indicate subdivisions and sub-divisions of these groups. It was subsequently found, however, that these elementary colours were quite inadequate to apply to express the different formations; in fact, it was far too narrow a scale, so that at Bologna and Berlin various modifications were made by the introduction of complementary colours. Referring to the unification of nomenclature in regard to the great divisions of the earth's crust, it had been felt that it was essential to have an agreement on the terms used, and it was recognised that a dictionary of geology comprising the etymology or root of origin of every geological name, a synonym in other languages, a definition in French, and an illustrative diagram would be very useful. It had been resolved to publish an international geological map of Europe on the scale of 1:500,000 which map was now in course of execution at Berlin. A preliminary general agreement had also been arrived at by the different countries appointed to inquire into the unification of geological terms, by which the term "group" should be applied to the three great stratigraphical divisions, thus—"Primary group"; "system" for sub-divisions of these, such as "Silurian system"; whilst the words "series," "stage," and "assize" were to be used in further sub-dividing. In like manner, in regard to divisions of geological time, the terms "era," "period," "epoch," and "age" would be recognised; thus "Primary era," "Silurian period," &c.

Amongst the questions for discussion at the present Congress, he said, would be the classification of the Cambrian and Silurian systems; the relations between the Carboniferous and the Permian, the Rhetic and Jurassic, and between the Tertiary and Quaternary. He concluded his address by alluding to the new questions to be raised respecting the crystalline schists.

On Tuesday, the 18th, Signor Capellini, Director of Bologna University, occupied the chair, when the classification of the Cambrian and Silurian rocks was discussed. The principal point at issue was whether it was advisable to divide these rocks into two great series, the Silurian and Cambrian; or into three by the introduction of the Ordovician between these two. The boundary line between the Cambrian and Silurian has always been the subject of dispute, the geologists of one school adding part of what others consider Silurian, to the Cambrian, and *vice versa*. The term Ordovician was proposed to embrace all the beds in dispute, and so to end the controversy; moreover, there are paleontological grounds warranting the division of the group into three parts, as all admit. The subject was very warmly discussed by the specialists of this branch, and the chairman, in bringing the proceedings to a close, observed

that in default of a unanimous decision the vote had better be postponed. Amongst the speakers were Mr. C. D. Walcott (Washington), Dr. Sterry Hunt (Montreal), Professors Otto Torell (Stockholm), Gosselet (Lille), Dewalque (Liège), and Kayser (Marburg); MM. de Lapparent (Paris), Delgado (Lisbon), Barrois (Lille), and Drs. Hicks, Geikie, &c.

Wednesday's meeting was occupied by the consideration of "crystalline schists." A series of memoirs had been printed and distributed amongst the members at the opening of the Congress, and these being taken as read, discussion at once proceeded. The memoirs and debates were of a very technical nature, the origin of the schists being the primary object to be attained by the discussion. The whole subject is involved in much obscurity, but the brilliant discoveries recently made, especially in this country, have materially assisted in clearing up many of the difficulties which lay in the way. At the present time there is no branch of geology occupying so much attention as these metamorphic rocks, but we think that it is premature to make any attempt at generalisation. We must be content to wait until more facts are accumulated in the field and by the microscope. We were not at all surprised, therefore, to hear so many diverse opinions on the subject at the meeting. The views expressed by the majority of the speakers were those which have already found vent in their various publications. Professor Lory (Grenoble), MM. Mattiolo (Turin), Macfarland (Ottawa), Issel (Genoa), Heim (Zurich), McPherson (Madrid) and others joined in the debate.

At the fourth sitting, on Thursday, the work for the meeting was the consideration of the limits of the Tertiary and Quaternary rocks. The discussion, however, turned on the question as to whether it is advisable to retain the term "Quaternary" in the classification at all. The general public are, perhaps, more interested in this day's proceedings than in those of any of the other days. The great thicknesses of sedimentary rocks, about twenty-five miles, composing the earth's crust, are divided into three parts, each of which is identified by special features of paleontological importance. Thus the Primary group is remarkable for the abundance, first of invertebrates, and then of fishes; the Secondary for reptiles; whilst the Tertiary claims the existing genera and species of mammals as its own. At the top of the Tertiary some deposits, a few hundred feet thick at most, contain records of the existence of man, associated with skeletons of the mammoth, rhinoceros, &c. Many years ago it was proposed to institute a fourth term, Quaternary, out of these superficial deposits. According to this mode of classification, the line at the top of the Tertiary would be drawn at the base of the Quaternary, the sedimentary rocks thus being divided into four parts. It is obvious, however, that it is impossible for many geologists to attach the same importance to the few hundreds of feet of strata comprised within the Quaternary beds as to the many miles in thickness of the Primary. It is admitted on all sides that the superficial deposits are important enough to be separated from those below, but only as a minor sub-division of the Tertiary, and not as a distinct geological group. It is not accompanied by any special biological change in the character of the fossils, as are the great groups referred to, the only circumstance of note being the appearance of man during their deposition. This fact, however, has called into existence an enormous literature, so great indeed as to be larger than that relating to the whole of the rocks beneath. In this way the importance of the deposits has become much exaggerated, and it, therefore, seemed fitting for the Congress to discuss the relative value of the beds in the general classification of rocks. The result of the discussion showed that they could not arrive at a satisfactory agreement on the conditions necessary to form a distinct group. Before any further progress can be made in classifying rocks, it seems necessary, therefore, to state precisely the nature of the essential characters which are to distinguish groups from the minor divisions. The same remarks apply to the different sub-divisions, MM. Renevier (Lausanne), De Lapparent and Gaudry (Paris), Sacco (Turin), Pilar (Agram), and Drs. John Evans, Blanford, and Professor Prestwich, joined in the debate.

At the fifth sitting, on Friday, M. Haucheorne (Berlin) submitted the first proof of a section of the geological map of Europe referred to in the President's opening address; after which the discussion on "crystalline

schists" was resumed. The proceedings were of a very technical nature, and precisely similar to those on the previous Wednesday, so we need make no further comment.

At the final sitting, on Saturday last, arrangements were made respecting the next meeting of the Congress at Philadelphia in 1891; whilst the report of the committee on the subject of voting at the Congresses was submitted. There has always been a difficulty in adjusting the votes, by reason of the fact that the countries in which the Congresses have respectively been held have naturally had a very much larger body of members present than countries at a distance, and this rule is always likely to obtain. Thus, at the present Congress, English geologists far outnumbered those of all the other countries put together, so that the English could carry any proposition they chose to bring forward, if their votes had the same value as those of the foreigners. To adjust matters, the committee came to the conclusion that the votes of native and foreign members should be taken separately. If the votes of the two divisions were accordant the result was to be accepted, but if they differed, the subject was to be considered immature for settlement. Theoretical matters were not to be voted on at all. Professor Prestwich then gave his concluding address, which was an epitome of the results achieved by the week's meetings; and, after the usual votes of thanks to various officials, the meeting in London terminated. In reality, however, the session is not concluded until to-day (Saturday). On Monday last, official geological excursions, to last during this week, were made by members to the Isle of Wight, North Wales, and Yorkshire, under the best available guidance.

Now that the general meetings are over, let us examine the results arrived at. In the first place we may state our conviction that so far as the actual meetings of the Congress are concerned they have done but very little towards advancing the science. One of the most important objects of the Congress, it is true, has been brought to a conclusion,—the unification of colours and shadings in maps. But this, however useful it may be in rendering the coloured maps in the proceedings of societies and the like uniform, will have no practical effect, we are afraid, on official maps. Most of the countries of Europe, for example, have official geological surveys which for some time past have been issuing coloured maps each on their own plan, adopting various methods of colouring. But few of these surveys have completed their maps, and very many years must elapse ere some of them will be able to do so. It is not possible that the future maps of these surveys will be coloured differently from their predecessors, for the series would not then be uniform. Again, referring to our own country, the maps which form the fundamental work of British geologists are those issued by the Geological Survey. The series is nearly complete, and we may be quite certain that the Government will not cause the whole of them to be re-issued according to the new colouring and nomenclature, on the ground of expense.

In regard to the other work of the Congress, we believe it will be useful in a certain sense, but we do not think that the most was made of the time at the disposal of the session. For example, if the Committee had resolved on the method of voting at the opening meeting instead of at the conclusion of the week's work, something like decided results might have been obtained. We fully appreciate the difficulties lying in the way of coming to a unanimous conclusion whilst the members of the Committee were separated from each other, but surely something might have been arranged so that the first meeting should have decided this all-important question.

Again, it may well be questioned whether the general methods of procedure were the best that could have been adopted for such a mixed assemblage of specialists. Geology has now grown to such an enormous science, that to make any real advancement there must be special departments, and, consequently, specialists. The technical questions brought forward at the meetings could not possibly be successfully debated by any save the specialists in the branches concerned. The result of this was that the vast majority of geologists present were wasting valuable time in listening to questions foreign to their particular departments. For instance, the debate on crystalline schists had comparatively little interest to those geologists who study, say, the Tertiary beds only.



Turning to another aspect of the science, it seemed a great pity that questions of practical value were not even alluded to. Amongst the geologists present we noticed some of the greatest authorities in Europe on the geological aspects of water-supply, mining, building-stones, road-metal, &c. It seemed a very fitting occasion to debate questions relating to the application of geology to various practical purposes, for we doubt whether so many eminent authorities on these subjects were ever before gathered together. The science would become much more popular if its applications to every-day work were better understood. We would not wish the *avant* to discuss anything foreign to the science, but simply to take the purely geological sides of the questions. Many of these latter are in no wise inferior to any of the greatest problems of the science in point of philosophic interest, whilst they are infinitely more useful to mankind. One has only to study the geological aspects of water-supply, for example, to become convinced of our ignorance on many points relating to the behaviour of water underground. We have occasion to know that some of these authorities at the Congress hold different views to the majority of English geologists on these and cognate subjects, but no provision was made to enable them to ventilate their opinions. The palæontological side of the science also was almost entirely neglected.

Now, we do not suppose for a single moment that the limited time at the disposal of the Congress would have enabled the members to discuss in detail the questions relating to every department,—it would be absurd to suggest such a thing. What we do say is, that the whole of the members of the Congress should only have been present at those discussions which affect every department of the science alike, whilst at other times provision might have been made for specialists to hold meetings for debating points peculiar to their respective branches. In other words, under such circumstances, the Congress should be divided into sections. We should then have obtained the greatest possible amount of work in the available time. The voting, also, could not fail to be more telling, for what is the utility of the whole of the members voting on questions of which many of them can have no special knowledge? Those only who have a right to an opinion on the particular subject under consideration should be entitled to vote.

Another thing we must take exception to, is the short time allowed for each meeting. The Congress met in the mornings only. It is true that whilst sitting they worked very hard, but then nearly double the work could have been accomplished if the hours had been extended. Instead of that, however, excursions to various places were arranged for the afternoons. Not that these were uninteresting, but it did not seem to be making good use of the time. The places visited were Kew Gardens, British Museum, South Kensington Museum, Eton, Windsor, Eridge, and Crayford. In the evenings receptions were held—on Monday at the London University, by Professor and Mrs. Prestwich; on Wednesday, at the Jernynstree Museum, by the Director-General of our Geological Survey, Dr. A. Geikie; and on Friday at Burlington House, by the President of the Geological Society (Dr. Blanford) and Mrs. Blanford. Each of these was numerously attended. The large library of the London University was turned into a temporary museum, in which was exhibited a large and valuable collection of rocks, fossils, maps, &c., mainly illustrative of the questions discussed at the Congress.

It must not be supposed, however, that the London meeting was done no good. On the contrary, the congregation of specialists has furnished the opportunity for many quiet chats and conferences, apart from the general meetings, and we feel sure that these have done more real good than have the formal gatherings. The evening receptions have, in this manner, been of the greatest use, as was apparent to even the most casual observer. The men who composed the Congress were those who have practically made the science what it is; they are all earnest devotees, and did not come here to idle their time away. Many groups were to be seen earnestly debating knotty points, the results of which will, no doubt, sooner or later be published in the memoirs written in their native lands.

The adoption of the French language has greatly facilitated these discussions, whilst the publications in advance enabled one to reflect on the different problems to be presented,

without fear of misapprehension. The publication of the nomenclature Committees of the different nations cannot fail to have an enormous influence in bringing about the unification of terms, and, even if the Congress had succeeded in doing nothing else, the work in this direction has produced a lasting impression of immense importance, not only to the exclusive students of the science, but to civil engineers, miners, and others whose daily avocations lead them to make practical use of the science.

## THE BASTILLE AND THE TOWER.

A PARALLEL.

WE have adverted from time to time in our "Letters from Paris" to the restoration carried out by M. Colibert (a pupil, by-the-by, of Viollet-le-Duc), and M. Ferruson, of the Bastille and the old Rue St. Antoine, on the Champ de Mars.

The Bastille may be regarded as the Tower rather than the Newgate of Paris; the latter prison, indeed, had for its closer counterpart, in Paris, the Conciergerie of the Palais de Justice. As touching both its origin and position, together with the uses it was made to serve, the Bastille, however, the style of features in common with the Tower of London. The Conqueror planted his vast *Axa Palatina* in the south-eastern angle of London, athwart the city wall, by the Postern and Iron Gate—a citadel dominant over the City, and the approach by the river Thames. The Bastille was established in the south-eastern corner of Paris, at a gate in the wall of the capital, and close by the water-side. Like, also, to the Tower, it was fortress and prison, and, though never a palace, was once used as treasure-house by the king.

The name itself of Bastide, from *bastir* or *bâtir*, since modified into Bastille, formerly denoted a work of defence, as part of a line of fortification. Bastides were of two kinds: those erected upon permanent foundations, and those of the sort so minutely described by Julius Caesar, which were built up for occasion by an army of besiegers. Until the end of the thirteenth century, however, the style of "bastide" was more commonly applied to temporary structures for attack than to fixed forts. But gradually, as that engine of assault fell into disuse, bastide was adopted as a generic term for towers or outworks, made of masonry, and connected with a circumscription or enceinte. The name of Bastide was given to the larger bastioned towns in France. Of those in the capital, the two most important were the Bastide St. Denis, and the Bastide St. Antoine—the Aldersgate and the Aldgate of Paris. The ancient Porte St. Antoine lay hard by the Arsenal on the Seine, at the point where the river entered the capital from the south-east. In King John's time, if not indeed at an earlier date, this gate in the city wall was flanked by two towers circular in plan. These answered, moreover, as a protection and guard for the arsenal. To carry out his scheme for completing the enclosure of Paris, Charles V., or the Wise, commanded Hugues Aubriot, afterwards Provost or Prefect of Paris, to strengthen the two existing bastions with the addition of six similar towers. The eight towers were connected by massive curtain walls; and the whole fortress was surrounded with a wide moat. The foss was crossed by two principal bridges to carry the road, east and west. In each tower was built a newel staircase giving access to the ramparts above.

In this manner the ancient Porte St. Antoine was transformed into a notable example of military architecture as that art was then practised. The plan of the remodelled fortress—which soon became known as the Bastille, *par excellence*, of the entire line of fortifications around Paris—may be described as an oblong in shape, standing with its greater length north and south, and having the outer (eastern) concave from within, in adjustment with the alignment of the wall. In the middle of the eastern curtain was the original Porte St. Antoine, flanked by its towers; the Tour de la Chapelle (north), and the Tour du Trésor (south); corresponding to these, in the western curtain, stood the gate that opened into the town, guarded by the new Tour de la Bertandière (south), and the Tour de la Liberté (north). The remaining four towers stood out from the four salient corners, and were known as the Tour du Puits (north-east), the Tour de la Comte (south-east),

the Tour de la Bazinière (south-west), and the Tour du Coin (north-west). All of the eight towers were half-engaged, of very massive proportions, and were capped with the customary conical roofs. Two minor gateways, leading to drawbridges, were placed in the northern and southern curtains, to afford access across the moat into the town and the arsenal respectively. Within the large central space was called La Grande Cour, north whereof lay the magazine and the Cour du Puits, and south another court, the guard-room, residences, &c. The city wall, we should add, adjoined the Bastille at the north-eastern angle, by the Wall Tower, or Tour du Puits. In Viollet-le-Duc's "Dictionnaire Raisonné de l'Architecture," vol. ii., edit. Paris, B. Bance, 1859, will be found a plan of this fortress, together with a *vue cavalière* as taken from the south-west. This latter view is reproduced from the representation of the city *à vol d'oiseau*, as it was in the time of Charles IX., 1560–1574, and which Viollet-le-Duc refers to as being in the tapestry at the Hotel de Ville.

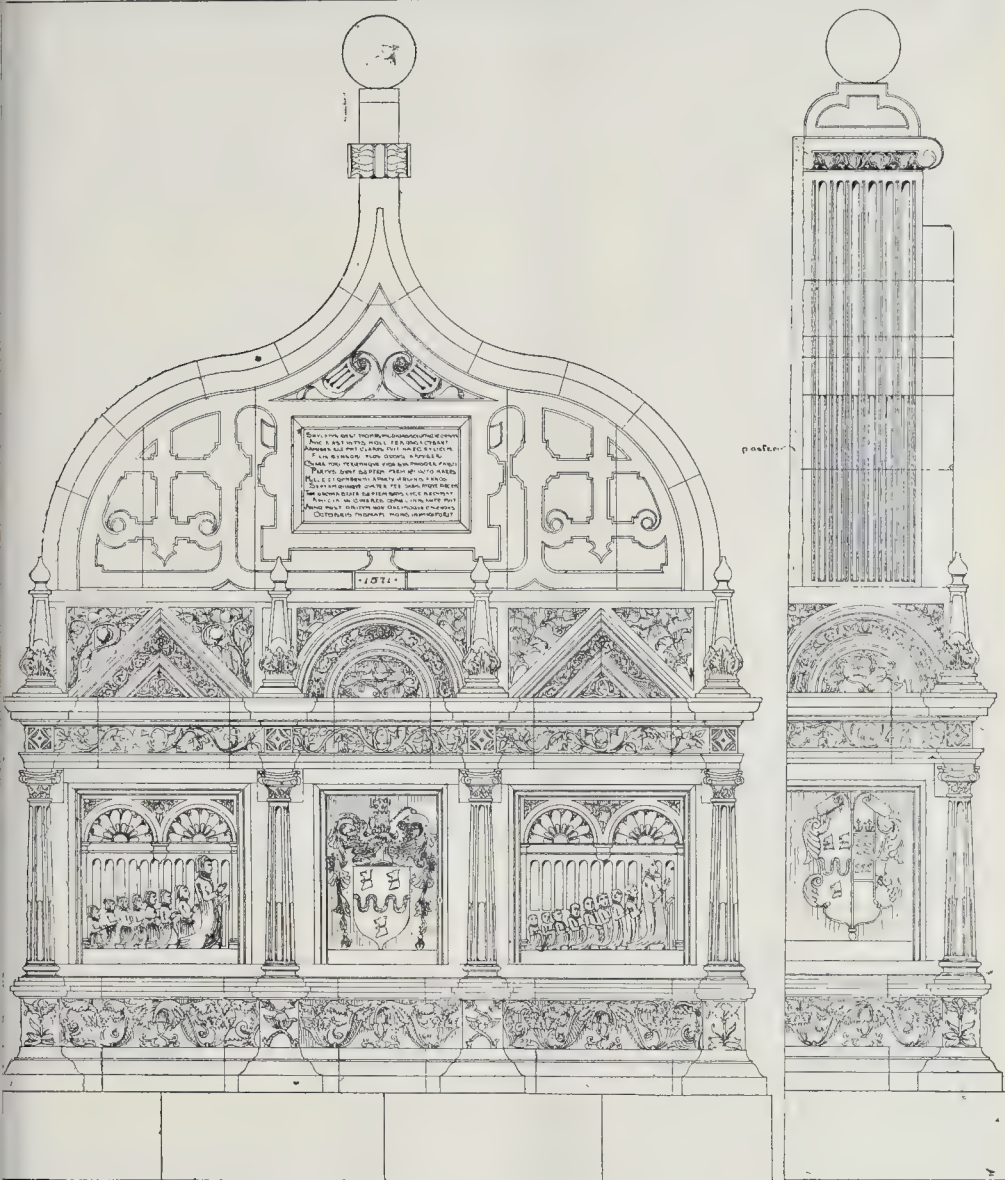
To again illustrate our parallel between the Tower of London and the Bastille we should point out that the Bastille St. Antoine, as we have described it, was originally erected to repel assault by the enemies of England. But when, eventually, foreign foes had disappeared it became in turn the key to the possession of the capital during seasons of revolt and civil war. In the year 1420 it was taken by John, Duke of Bedford, who nominated for its captain-general that redoubtable warrior, Sir John Fastolf. Sir John, perhaps, is equally renowned for his benefactions to Magdalen College, Oxford, and to the Schools of Law and Philosophy at Cambridge. When Charles VII., or the Victorious, re-captured Paris from the English in 1436, the Bastide afforded a refuge for his adversaries. In the year 1558 the Bastide St. Antoine fell into the hands of the Duc de Guise, who gave the command of it to Bussy Leclercq, and incarcerated within its gloomy towers the Parliament for their non-adherence to the League. During the siege of Paris, 1587–1594, Henri Quatre was for a long while successfully resisted in his endeavours to secure this fortress. But on becoming master of Paris he committed the Bastide to Sully's charge and converted it into his treasure-house—just as our sovereigns formerly did with the Tower. On January 11, 1649, the Bastide capitulated to the forces of the Fronde, and by treaty the Frondeurs retained possession thereof. It was not restored to the king until October 21, 1651.

The annals of the Bastille—to use the more familiar designation—as a state prison are supposed to date from the reign of Louis XI. That monarch was wont to call the iron cages with which he furnished it his "fillettes." In one of them, by the way, was kept for eleven years the inventor, the Cardinal Balue. The prelate is familiar to every reader of a work which to this day gives us the most masterly portrait of his Sovereign—"Quentin Durward." But it was not until Louis XIII.'s reign that the Bastille served regularly as a place of durance, when, and for ever since, its very name has been adopted as a synonym for the exertion of atrocious oppression. Yet in his recently published book Captain Denis Bingham goes far to demonstrate that the commonly-received tale of horrors is painted in blacker colours than actual facts will warrant. Soon after the historic assault, of three hours' duration, on July 14, 1789, the Bastille was demolished. Much of the materials were utilised in constructing the Pont de la Concorde, 1790. Nevertheless, the Porte St. Antoine, as a gateway, survived for many years later. The prison site is now marked by a line of stones in the recently re-named Place de la République. Within the last fifteen years the familiar figure of Mercury has been replaced with the figure of the Republic on the summit of the column of July. That column, entirely of bronze, and 154 ft. high, does not commemorate the Bastille, but was erected in 1831 in memory of those "citoyens"—i.e., denizens of the adjacent insurrectionary faubourg,—who fell in the "Three Days" of July in the year before.

**Appointment.**—At the monthly meeting of the Rural Sanitary Authority, of Kineton, last week, Mr. E. Willcox, engineer, Birmingham, was appointed to inquire into the question of providing a water-supply for the parish, with the view of propounding a scheme for an adequate supply.

\* See the *Builder*, vol. liv., No. 2,348, p. 80; cf. ante.





Front Elevation:

Side Elevation:

The Mildmay Tomb in St. Mary's Church, Chelmsford.—Drawn by Mr. H. P. Burke Downing.

#### THE MILD MAY TOMB IN ST. MARY'S CHURCH, CHELMSFORD.

THIS tomb, which stands in the north aisle of Chelmsford Parish Church, is one of the few objects of antiquarian interest now left there, out of the ancient tombs having been no doubt destroyed by the fall of the greater part of the building in 1800, caused by the undermining of the foundations. The two large panels of the front elevation contain painted effigies of Thomas Mildmay, with his wife and fifteen children. The workmanship of this tomb, like good deal of the work in the Eastern counties, shows a certain amount of Dutch feeling. The carving is all most carefully executed, and, with the exception of the panels containing the effigies and the family arms, is kept in very low relief. It is noticeable that the small pilasters have their abaci curved upwards. The illus-

tration is from measured drawings by Mr. H. P. Burke Downing.

#### THE ARCHÆOLOGY OF TIN.

IN the recent notice on "Ancient pigs of lead," printed in the *Builder*, No. 2376, an endeavour was made to show the reader some of the many interesting facts, antiquarian, historical, and technical, which are illustrated by those remarkable objects. We may now, in like manner, turn our attention for a while to the consideration of an equally important metal, which, although represented by a far smaller series of extant antiquities, possesses aspects of history and fine art scarcely inferior to that which then formed the subject under review. Tin, too, it is found, has its earliest history buried in oblivion, for no one knows at what precise date this metal fell under the observation of man

It is not unlikely that accident, to which so many discoveries both ancient and modern are due, first displayed the characteristics of tin to those who were not slow to profit by what they saw. But be this as it may, there is no doubt that the aboriginal inhabitants of the southwestern parts of England were in possession of the mystery of tin-smelting long anterior to the Roman conquest. Some of the most ancient notices of our islands speak, as does the account by Polybius, for example, of the method in which the tin was obtained and prepared in the Britannic Isles, as if it was a matter of ordinary knowledge. From sources such as these, we learn that the Phœnician traders drew their supplies of this metal—an article in use as remotely as the Homeric age—from Britain. The late T. Wright, whose authority possesses great weight, considers that as this metal is found principally in Cornwall



and the Solly Isles, parts of Britain which would first present themselves to navigators from the Phœnician port of Spain, Cadix, we are justified in believing that these parts, and the south of Ireland, *i.e.*, Albion and Ierne, were the only districts visited by those people, who kept their knowledge profoundly secret with the manifest intention of monopolising a lucrative branch of commerce. Strabo, the geographer, narrates the vain attempts of the Romans to discover the place whence the tin was then obtained, and says that on one occasion a Phœnician captain, perceiving that he was watched by Roman vessels, ran his vessel upon some rocks rather than allow the secret to be revealed, and was rewarded by his own government for his patriotic conduct.

The mission of a Roman commander by Cæsar at the close of his first campaign in Gaul, to reduce the tribes on the shores of the British Channel, led to the discovery by Rome of the route by which the merchants of Phœnicia reached Britain by sea, and demonstrated the ease with which tin was obtained, it being then found on the surface, or at a very little depth below the surface, of the ground. Previous to this, however, the Carthaginian expedition of Himilco, between 362 and 350 B.C., had visited the "Tin Islands," near Albion, two days' sail from Ierne, by which, according to Wright, he is supposed to mean some of the isles on the Cornish coast, unless, perhaps, Guernsey or Jersey is alluded to; and another commercial state, the Phœcean colonies of Massilia and Narbona, Marseilles and Narbonne, carried on the same commerce overland. At the Polytechnic Institution at Southampton, in 1864, Col. Sir Henry James brought forward reasons which have been supported by many others, for considering St. Michael's Mount, Cornwall, to be Ictis, the mart at which the ancient British tin trade was conducted. On the other hand, the late Rev. Edm. Kell, M.A., F.S.A., an indubitable and distinguished writer on the subjects connected with ancient British archaeology, holds the opinion that the Isle of Wight was the locality alluded to by Diodorus Siculus in the well-known passage declaring that the metal was carried from the district in which it was found to an island in front of Britain named Ictis, where it was purchased by native merchants, transported to Gaul, and carried overland for thirty days by pack-horses to the mouth of the river Rhone. Kell points out that it cannot be precisely ascertained when the tin trade of the Isle of Wight began, but conjectures the date to be between 300 and 200 B.C. Its decline he places at the time when the entire conquest of Britain by the Romans supplied more convenient marts. The arguments in favour of these two routes would be out of place here, they may be examined and weighed in Kell's account of a Roman building in Gurnard Bay, in the "Journal of the Archaeological Association," vol. xxi.

We may now pass on to the investigation of some points connected with the knowledge by the ancients of the characteristics of the metal. Here, again, at first, all is obscure and confused. It is doubtful if tin was originally discriminated from pewter and some kinds of lead. Archaeology is indebted to the elder Pliny for the earliest account of the uses and properties of this and other metals. As for tin, *cassiteros*, or *plumbum album*, this writer declared it was fabled to be sought for in the isles of the Atlantic, to which it was brought in wicker vessels, covered with leather, but now (that is, in his day) it is ascertained to be indigenous in Lusitania and Galicia. In sandy surface soil, to be of a black colour, and only distinguished by weight. Small pebbles of the ore also occur, he goes on to say, principally in dried beds of streams, which were washed by miners, who melted the product of their washing in furnaces. The Homeric mention of this *cassiteros*, as entering into the composition of the armour of the heroes of the poems and the chariot of Tydides, imply easy fusibility and ductility, and a high money value. Pliny's knowledge of tin in Spain is confirmed by recent mineralogical investigations, which show it occurring in beds of the mica schist of Galicia; and in the form of oxide of tin the metal is now known to be widely distributed over the world. Dr. J. Phillips, who has investigated the ancient metallurgy of Britain, considers that Cornwall and the Asiatic Isles have been the principal, almost the only, sources of the tin of the ancient world.

*Stannum*, an alloy of argentine or tin-like aspect, a variable power, melting at a less temperature than copper, was used for lining copper vessels, the danger of using untinned copper

vessels being known in Pliny's time. So-called "German silver" and "Britannia metal" belong to this class: the term *stannum* being applied to natural alloys of tin with lead, brass, antimony, or silver; but now distinctive appellations are given to these forms. The easiest way of melting the tin ore, according to Phillips, was on the "open hearth;" another use of peat as a proper fuel to supply the necessary free carbonaceous element is shown by the indispensable privilege of digging turf to melt tin, introduced into the charters of King John in 1201, and subsequent Royal confirmations, which were from time to time granted to the miners of the south-west of England. The employment of the bellows, a very ancient adjunct of the workman (depicted as it is in Egyptian tombs), completed the apparatus; and pure tin having thus been obtained, the rest was but a matter of time, and combinations and alloys, the art of soldering, and so forth, gradually became known. Curious to say, the proof that the direct union of tin and copper was carried out by the natives of Britain is wanting, although one recent writer thinks the evidence is gradually accumulating in favour of bronze-making in Celtic Britain before the Romans came, and it is thought by others that bronze passed into the ancient world of civilisation through the medium of manufactures at Cyprus for one at least of its centres.

Recent investigations on Dartmoor, which have been carefully described by Mr. R. Burnard in the "Transactions of the Plymouth Institution," indicate the disturbed state of the surfaces of the valleys, with evidence of "tin-streaming" operations, in mounds and excavations, for mile after mile; remains of rude smelting-houses, stones with curious circular cavities, and moulds for use in casting ingots, hewn in granite blocks, furnaces, ancient water-courses, and wheel-pits. During the Saxon period the production of tin, in succession to the native works, seems to have been neglected. Tin streams and mines, whether outside the scope of the Domesday Book or not, at any rate find no mention in that record, whereas lead and iron occur continually. Probably the earliest record of a stannary is that in the Pipe-roll, 8 Rich. I., A.D. 1197, wherein account of 100*l.* for the farm of that of Devonshire, and 100 marks for that of Cornwall, is rendered for the year. The visible remains of tin-streaming works on Dartmoor are at least as old as this, and probably of much more remote date. According to Dr. J. Evans, P.S.A., as cited by Mr. Burnard, the commencement of the bronze age in Britain is approximately to be reckoned from 3,000 to 4,000 years ago, and if the hardening of copper by alloy of tin was carried out—as some assert—on the spot, its production on Dartmoor is equally remote. At first, no doubt, the stores of the ore were simply gathered on the ground, as evidenced from the main lode; then followed trenching to the depth of 5 ft. or 6 ft. in depth, and 3 ft. or 4 ft. in breadth; finally, the true mining or excavation and improved processes of smelting, at length brought the getting of tin down to its latest aspect. Mr. Burnard has measured and described two ruined sets of "blowing-houses" on Dartmoor, where the pit for the overshot water-wheel,—which worked the furnace bellows, and turned a crating-mill, or worked rude stamps,—circular or oval-shaped cavities which may have been moulds, mortars, bottom-stones of primitive stamps, and other manifold relics of the tinminers' apparatus, were found.

At Week-ford, near the junction of the Dart with the Wobrook, one of these ancient smelting houses stands in dilapidated ruin, a parallelogram 33 ft. long and 16 ft. wide with an outer enclosure. Not far off is another smaller ruin with a fireplace recess, a portion of a chimney back, and a hearthstone removed from its original position, and walls from 3 ft. to 4 ft. wide. The foundations of the waterway or "launder" conveying water to the wheel are visible. In the neighbourhood is a hut circle measured to 27 ft. in diameter, with foundations apparently Celtic, and with traces of later use, and ancient enclosures up the hill, as it were mapping out the slope in squares. Another, the "Har Tor" blowing-house, two miles to the south-west of Princetown on the head waters of the Meavy, shows two ruins, one on each side of the stream. In one, 16 ft. by 12 ft., the chimney still stands 6 ft. in height, and there are stones lying about provided by the smelters, with circular cavities of varying dimensions for receiving molten metal. In the other, 22 ft. by 16 ft., the entrance doorway 3 ft. 6 in. wide and 5 ft. high, with jamb and lintel grooved and holed for a

door, wheel-pit, water outlet, and other details are yet preserved. Numerous hut circles stand on the neighbouring slopes, and the disturbed appearance of the valley indicates very active streaming operations at some far distant period. At Gobbett, near Hexworthy, are examples of three successive stages of the tin miner's art, *viz.*, the stream works of the "old men," the deep trenches of later miners, and the modern shaft. Here, too, are found the remains of a crating-mill, or crusher, with upper and nether stone, the latter 3 ft. 10 in. diameter and 10 in. thick, and circular eye 6½ in. wide, and having in its periphery a groove forming a lip whereby the triturated stuff was readily discharged from the stone. The upper stone measures 3 ft., with central eye 5 in. diameter. A pointed conical plug fitting into the nether stone also fitted the upper one loosely. This enabled the broken ore to be fed into the mill, while the upper stone was rotated by means of handles or bars fitted into holes somewhat after the method of a capstan. The most interesting object here is a stone, about 4 ft. by 3 ft., bearing a mould-cavity 15 in. long, 1½ in. wide at one end, 10 in. at the other, and 4 in. to 5 in. deep; near to it on the same side two small holes, considered to have been used as sampling cavities. Another stone has a cavity for molten metal 17 in. long, 10 in. wide at one end, and 15 in. at the other, with depth varying from 3 in. to 8 in. The proximity of furnace slag, flint chips, flakes, and scrapers shows that there were early men at work on the tin in this part of the moor.

Rectangular buildings, similar to the foregoing in many respects, have been observed and described in other localities of Devonshire and Cornwall, associated with hut circles and other prehistoric remains. They must either be contemporary with these remains, or evidences of a successive occupation of sites previously worked. The dimensions of the moulds or stones adjacent to these have been recorded as 17 in. long, 11 in. wide, 8 in. deep, and 16½ in., 17 in., 3 in. respective sides. One mould, on a stone, is connected by a channel with another at a lower level, as though it were used for the purification of the tin, for molten metal mixed with impurities in the furnace poured in on the high-level depression, or would flow in a purer state into the lower mould. At Swincome, in a valley once extensively streamed for tin, are the remains of one of the rectangular houses concealed in a mound; it measures 20 ft. by 13 ft., built of dry-laid stones, some roughly shaped, and having a chamber at one end which appears to have formed part of the furnace arrangement.

It now remains to describe briefly the tin ingots and other relics of this ancient tin manufacture. In the neighbourhood of Penzance, between Pendinas and St. Mawes, a mould for tin blocks appears to have existed, but its form and dimensions have escaped observation. A very remarkable specimen of double-pig was dredged up at Falmouth, about 1810, and passed into the possession of the Truro Museum. The dimensions are 2 ft. 11 in. long, 3 in. thick, 11 in. wide, between the forked opening 10½ in., each prolongation 12 in. long. It is shuttle-shaped, or pronged (I), and has been thought by some to be in the form of an ancient letter or symbol, by others as an *astragalus*, or knuckle-bone shape. On one of the arms is the impression of a bifurcate mark. It is flat on one side and curved on the other. Sir Henry James ingeniously accounts for the adoption of this shape by claiming for it a peculiar fitness for being stowed at the bottom of a boat, and on a saddle for a beast of burden. Moulds of this character have not yet been met with. The Museum of the Plymouth Institution contains also an ancient ingot of tin with a hole for use in transport, 14 in. long, 8 in. to 7 in. wide, 62 lbs. weight. It is one of two of identical form found in digging a drain at Slade, near Cornwall. In the Truro Museum is a portion apparently of a pig or block of tin found at Gurnantun, in Cornwall, near the ruins of a so-called "Jews' House," or ancient smelting-place. It is wedge-shaped, 20 in. long, 9 in. wide, 3 in. thick, tapering to a blunt point, one side convex to the form of the mould, the other flat. In the Great Exhibition at Hyde Park, in 1851, a rudely-smelted block of tin was shown by Mr. G. N. Simmons, found in Ladock, near Truro, and believed to have been manufactured when the Phœnicians traded to Cornwall for tin. It is recorded that tin was exported in long, square slabs in the fourteenth century, but no examples have come under our notice. This catalogue of ancient tin blocks is not extensive, but enough have been recorded to illustrate the special aspects of the archaeology of this metal.



THE INSPECTION OF PIPE SEWERS.

In the *Builder* of Sept. 4, 1886, there is an account of the progress of the City of Buenos Aires Improvement Works, and it is therein stated that there are about 116 miles of continuous sewers in the city portion or first section of the drainage and sewerage works. These include about eighty miles of stoneware sockets of 12 in., 15 in., and 18 in. diameter. They are laid in straight lines, and the distance between the manholes is about 140 yds., equal to the length of a side of one of the squares into which the city is divided. One manhole forms a junction-chamber for one or more sewers.

In the construction of the pipe sewers the chief difficulty encountered by the engineers is the want of experience on the part of native contractors; they did not always understand the necessity for great care in laying the pipes correct gradients, in jointing them, and in keeping them free from obstructions.

During heavy rains, peculiar to that country, quantities of mud were deposited in the manholes, and there was a risk of blocking up the sewers unless proper precautions were taken against it. There was also the possibility of fractured pipes being used in place of sound ones. Sometimes the sight-rails were knocked down and carelessly replaced without the knowledge of the clerk of the works.

Under these circumstances, no certificate of completion could be given until a very careful inspection of the lines and levels of the sewers was made to end had been made. The accuracy of the levels of the pipes where they joined the manholes was easily tested; those that were incorrect had to be relaid without further inspection; those that were correct at the manholes were further inspected as to line and level between the manholes, and for this purpose the latter adopted the method described below, which was carried out successfully in about 100 pipe-sewers.

A pipe-sewer, properly laid and jointed, could be similar internally to the inside of a cylindrical tube, without projections or obstructions of any kind; therefore, if a light is shown at one end, the same would be seen all round the perimeter at the other end if there was no obstruction.

In each case where daylight was not available, a powerful bull's-eye light was placed at the end of the pipe, and at the other end lines were stretched across the opening, as in Fig. 1. If the light could be seen along all

level, or crushed. A few examples will show results:—

12-in. Pipe Sewer, Calle San Juan.

Diagram of Inspection No. 1.

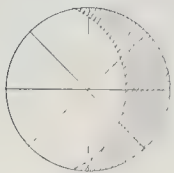


Diagram of inspection showed that the sewer was either out of line or crushed.

Result of inspection by contractor showed that the pipes had been laid out of line.

15-in. Pipe Sewer, Calle Callao.

Diagram of Inspection No. 2.

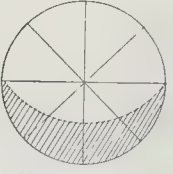


Diagram of inspection showed that the sewer was either obstructed by mud, or was out of level.

Result of inspection by contractor showed that pipe was obstructed by mud.

12-in. Pipe Sewer, Calle Asuenaga.

Diagram of Inspection No. 3.

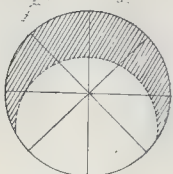


Diagram of inspection showed that the sewer was either out of level or crushed.

Result of inspection by contractor showed that pipes were crushed.

It is not customary to give much attention to the inspection of pipe sewers after contractors have completed them, but it is obvious that such an inspection is necessary. A great many obstructions in pipe sewers are often due to mud and silt getting into them during construction, and they are only removed afterwards at great expense to the local authorities.

Brick and concrete sewers are usually thoroughly inspected inside for line and level, and for quality of work. With pipe sewers it is different, but much may be done towards obtaining satisfactory results with them if the above system of inspection be adopted.

JAMES G. KILLEY, A.M.Inst.C.E.

**Proposed Railway Extension in the Lake District.**—A large and influential meeting has been held at Penrith to further the scheme for making a railway to connect Ullswater directly with the London and North-Western Railway. The proposal is to make a single line from the London and North-Western main line near Yanwath to Pooley by way of Sockbridge Hall, Barton Church, and Pooley Mill. The trains would run on the main line as far as Yanwath, where they would branch off and travel on the new line. The cost of the line is estimated at 30,000l. The meeting, which was presided over by Mr. W. J. Marshall, passed a resolution in favour of petitioning the London and North-Western Company to construct the line.

THE SURVEYORS' INSTITUTION EXAMINATIONS.

We have been requested to call attention to the following intended alterations in the Examination Syllabus of the Surveyors' Institution:—

**LAND AGENCY CANDIDATES.**

After the Professional Examination of 1889, the new Syllabus of Agricultural Chemistry will take the place of (1) the Syllabus of Chemistry, and (2) the Syllabus of Agricultural Chemistry. The Land Agency Candidates in Division III., Sub-Division I., will, in subsequent examinations, undergo an elementary examination on the basis of Sections 1, 2, and 3 of the new Syllabus of Agricultural Chemistry; and candidates in Division IV., Sub-Division I., a more advanced examination in these subjects, as well as in the subjects referred to in Sections 4 and 5 of the new Syllabus of Agricultural Chemistry.

Candidates in 1889 in Division III., Sub-Division I., will have the option of being examined in Elementary Chemistry on the basis of the existing syllabus of that subject, or in Sections 1, 2, and 3 of the new Agricultural Chemistry Syllabus.

Candidates in 1889 in Division IV., Sub-Division I., will similarly have the option of being examined in Agricultural Chemistry on the basis of the present syllabus of that subject, or in Sections 1, 2, 3, 4, and 5 of the new Syllabus of Agricultural Chemistry; but notice of their intention must be given with the notice of candidature by all electing to be examined on the basis of the new Syllabus of Agricultural Chemistry.

**VALUATION AND BUILDING CANDIDATES.**

After the examination of 1889 all candidates in Division II., Sub-Divisions 2 and 3, and in Division III., Sub-Divisions 2 and 3, will be required to undergo an examination on the basis of the new Syllabus of Mensuration. This subject will, after the examination of 1889, take the place, in the Valuation Sections, of Agricultural Law, which will cease to be a subject of examination in those sections.

Valuation candidates in 1889 in Division II., Sub-Division 2, and Division III., Sub-Division 2, will have the option of being examined in Agricultural Law on the basis of the existing Syllabus of that subject, or in Mensuration on the basis of the Syllabus of that subject; but notice of their intention must be given with the notice of candidature by those electing to be examined in Mensuration in preference to Agricultural Law.

Building candidates in 1889 in Division II., Sub-Division 3, and Division III., Sub-Division 3, will similarly have the option of taking Mensuration, or of being examined on the basis of the present curriculum; but notice of their intention must be given with the notice of candidature by those electing to be examined in the new subject.

**New Science and Art Institution, Walsall.**—On Monday last, the new Science and Art Institution at Walsall, the foundation-stone of which was laid last year, was opened by Sir Charles Forster, Bart., M.P. In external appearance the new building has a ground plan of rather plain but substantial design. The middle floor has the windows divided into pairs and triplets, with terra cotta hood mouldings and glazed with ornamental lead lights. The top story has groups of three windows, with moulded terra cotta lintels, supported by cusped brackets. The wings at both ends have gables and geometrical panels, filled with modelled ornamentation. Internally the principal entrance opens on a spacious square hall, at the back of which swing doors give access to the corridor in which the art rooms are situated. These are 22 ft. high, and have lofty windows with a northern aspect. The first floor is devoted to class-rooms for science students, committee-room, and caretakers' apartments. On the third floor is a large lecture-hall and examination room and a chemical laboratory 71 ft. long, with the adjoining class and small lecture rooms, chemical store, and balance rooms and other conveniences. The building is warmed with a low pressure hot-water apparatus. It will cost about 5,500l., and has been erected from the designs of Messrs. Dunn & Hipkiss, of Birmingham, by Messrs. Barker & Son, of Handsworth.

**Manchester Ship Canal.**—On Saturday the 22nd inst. upwards of 240 members and friends of the Manchester Association of Engineers visited the Eastham Section of the Manchester Ship Canal Works, under the direction of the President, Mr. Samuel Dixon. On arrival at Eastham the party was conducted over the greater part of the works, the chief engineer kindly explaining the salient points of the scheme during the journey.

Fig. 1.

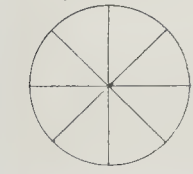
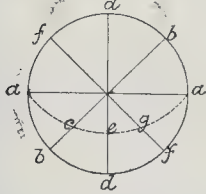
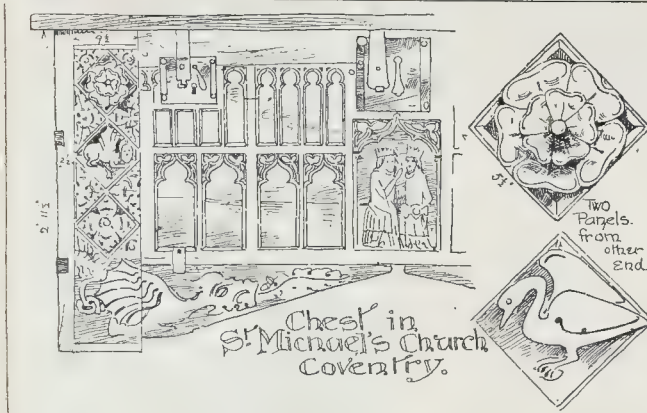


Fig. 2.





CHEST IN ST. MICHAEL'S CHURCH, COVENTRY.

THIS is a sketch, with one or two details, of a rather characteristic late Gothic chest at St. Michael's, Coventry.

### Illustrations.

#### SPADA PALACE, ROME.

THE Spada Palace, now the "Court of Cassation," was begun by Cardinal Capodiferro in 1564, from the design of Giulio Mazzoni. It was finished from that of Borromini, who appears to have thought the work of his predecessor too plain, and has covered the building with a mass of ornament in very questionable taste. The chief treasure of the place is the statue, of heroic size, generally held to be that of Pompey, at the base of which Cæsar was murdered.

Our illustration is of a part of one of the façades to the chief courtyard immediately above the colonnade.

#### SAN GREGORIO, ROME.

SAN GREGORIO, on the Coelian Hill, is a little-visited church, attached to an abbey which is the headquarters of the Camaldolese monks. It was rebuilt by Francesco Ferrari in 1734, but sixteen granite columns in the interior are ancient, and probably re-used from the earlier building, founded in the seventh century, on the site of the home of St. Gregory. Its chief treasures are frescoes by Guido and Domenichino; but the church and the atrium attached to it, which was erected by Soria in 1633, contain besides many sepulchral monuments and fragments of Renaissance sculpture. St. Augustine and some of our earlier archbishops were educated in the abbey to which the church belongs.

#### STAIRCASE, STOWELL PARK, GLOUCESTERSHIRE.

THE staircase itself, which is illustrated in the present number, is old work, as well as the handrails and balusters, and has only been slightly altered in its arrangement; it is of ash. All the panelling to the walls, with the plaster frieze and ceiling, is new work recently carried out. Mr. John Belcher was the architect; Mr. Groves the builder.

The drawing from which the illustration is taken was in the Royal Academy Exhibition of this year.

#### NEW PARISH CHURCH, TEDDINGTON.

THE large church now being erected at Teddington closely adjoins, and is intended practically to take the place of, the small brick building which has hitherto served as the parish church. The latter, which there is no present intention of destroying, is of small interest in itself. Teddington was formerly a chapelry to Staines, and the chapel of St. Mary as built, or rather rebuilt, in the 16th century—of brick with stone dressings—now forms the south aisle of

the old church, which has been added to at various times—notably by Dr. Stephen Hales in the last century, when the north aisle and the little tower were built.

Towards the erection of the new church two residents gave large donations on condition that the scheme should have for its object something more than the common-place suburban church. In making the design the architect was required to provide an apsidal east end, with aisle round it, and to make the general proportions narrow and lofty. The complete scheme includes a nave of seven bays with a western vestibule beyond it, a baptistery and a tower. At present the chancel and five bays of the nave are in progress, the superstructure having been begun in the autumn of 1886. The building will be groined in stone throughout, the main vault being 70 ft. 6 in. to the apex. A double chancel arch adjacent to the transverse ribs separates the nave and chancel. The thrust of the upper vault will be sustained by flying buttresses. The vestries are made larger and more complete than is usually the case. Doubling stone, supplied and worked by Messrs. Trask, is used throughout. The roofs will be covered with copper. The foundations, of Portland cement concrete, were made a separate contract, and cost 1,062*l.*, the main piers being carried down to the London Clay. The contract for the first portion of the superstructure was about 19,000*l.* in amount. Mr. William Niven, F.S.A., is the architect; Messrs. Adamson & Sons, of Putney, the builders; and Mr. H. Luscombe the clerk of works.

#### OLD COTTAGE ARCHITECTURE.—VI.

ONE of the principal features of old cottages and houses in Surrey is the skilful arrangement of the chimneys.

In this respect, this little corner that I am illustrating is, I think, equal to anything in England. In stone countries the chimneys are seldom a feature of interest, and, although elsewhere more elaborate brick chimneys may be found on the larger houses, I know of no district where there is more variety of the humbler kind worthy of close study.

In the older cottages, where rough stone was used before brick was plentiful, the chimneys were generally of plain character, but with the general use of brick a more ornamental treatment became usual.

There are two classes of chimneys; the inside chimney, showing only in a shaft appearing through the roof, and the outside chimney, which usually stands clear of the house wall and is of large dimensions and usually of ornamental treatment.

The base generally contains a chimney-corner or ingle-nook, or, at any rate, covers a wide opening, and the manner in which this is narrowed up to the shaft gives rise to an endless variety of picturesque treatment. The slopes are generally covered with tiles, and the edge of this tiling commonly concealed by a parapet of crow-steps.

The illustration I give of one chimney at Unsted Manor (fig. 1) will illustrate this, and also the way in which the crow-steps are formed.

Owing to the ease with which the top brick is displaced these crow-steps have in too many cases been destroyed, and nothing but the

square bases remain. It is astonishing how universal this ornament was. It will be constantly found attached not only to old houses, but on old chimneys to which most prosaic

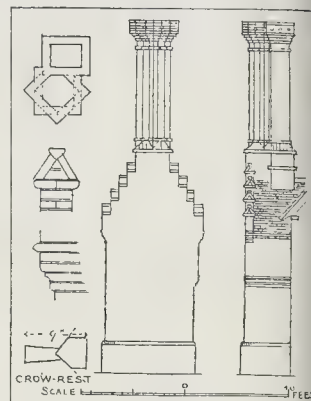


Fig. 1.

modern brick cottages have been added. The accompanying cut (fig. 2) shows an unusual elaboration on the old timber house at Gomshall.

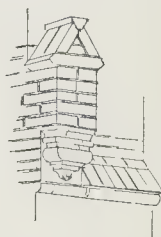


Fig. 2.

My sketches show a number of varieties of these outside chimneys, which might be largely increased by excellent examples where the building attached is not so interesting.

An essential feature of this outside chimney is the span roof behind them. This sometimes serves to give headway to the fireplace inside, and in any case serves to throw off the snow and rain, and is also most important to the general effect.

The mutilated ornaments in the head of the chimneys at Unsted are doubtless the remains of "crow-rests," such as may be seen in the fine chimneys of Abbott's Hospital at Guildford. They consist of a brick cut where projecting to a slightly tapering cylinder.

Unfortunately, in building new cottages one is generally debarred on economic and utilitarian grounds from the use of these outside chimneys, and there is perhaps more to be learnt from the treatment of what I may call the roof chimney.

One form of these is that in which the shafts starting from a solid block are slightly detached, or are set diagonally, as shown in several sketches. In another form the block has round arched panels, as at Abinger and Compton. This form, however, is not common in the neighbourhood.

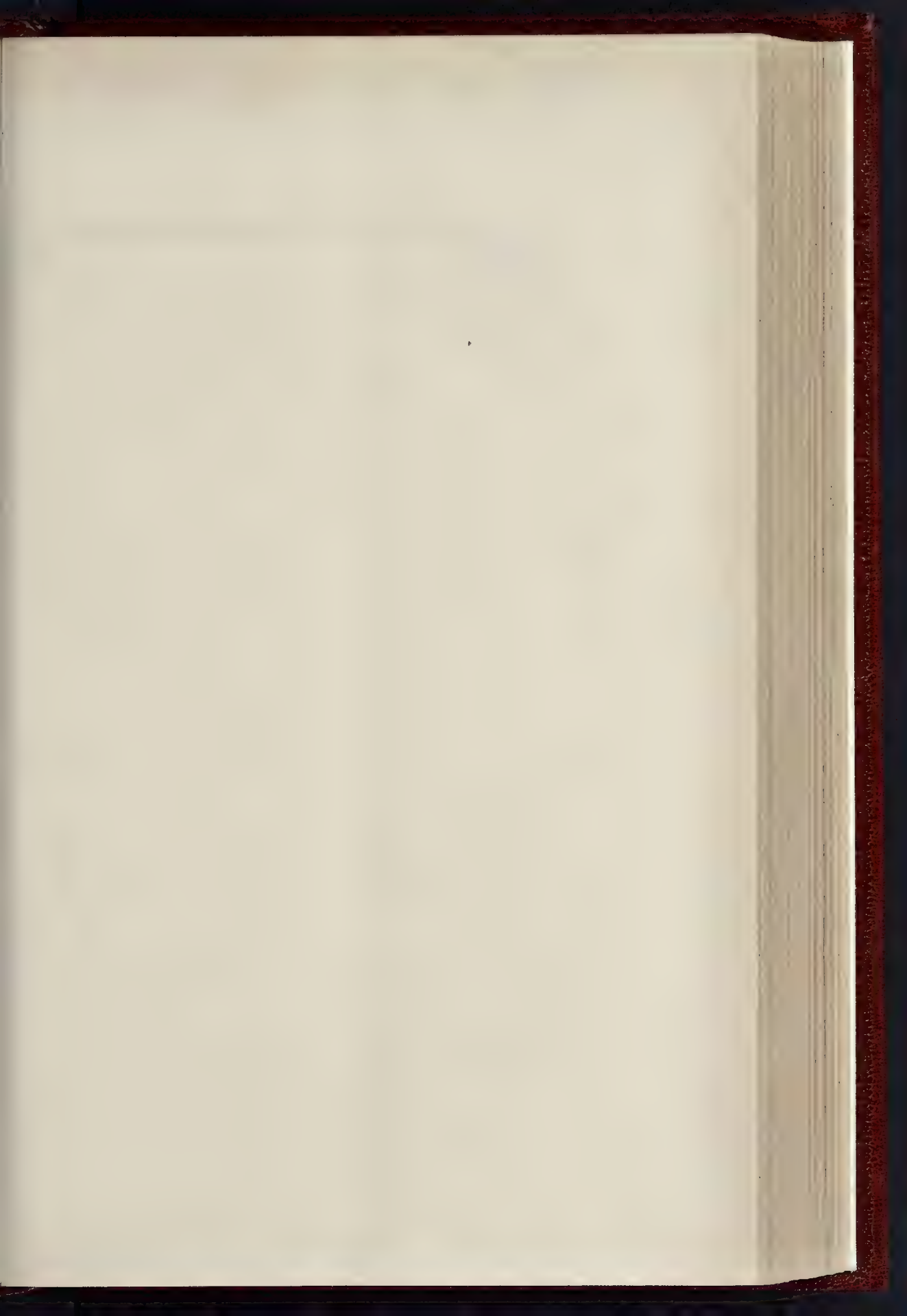
In some cases the block is simply ornamented by projecting the wythes 2½ in. Great strength is gained by this plan if care be taken that these projecting wythes are built alternately solid and closure, and not all closure bird-mouthed to the block, as I have known done in new work. Most commonly the projection is square, but occasionally diagonal.

By far the majority of roof-chimneys depend for their picturesqueness on the skilful arrangement of the flues by which, instead of appearing as a square block, the shafts present a number of angles, thus gaining a variety of light and shade.

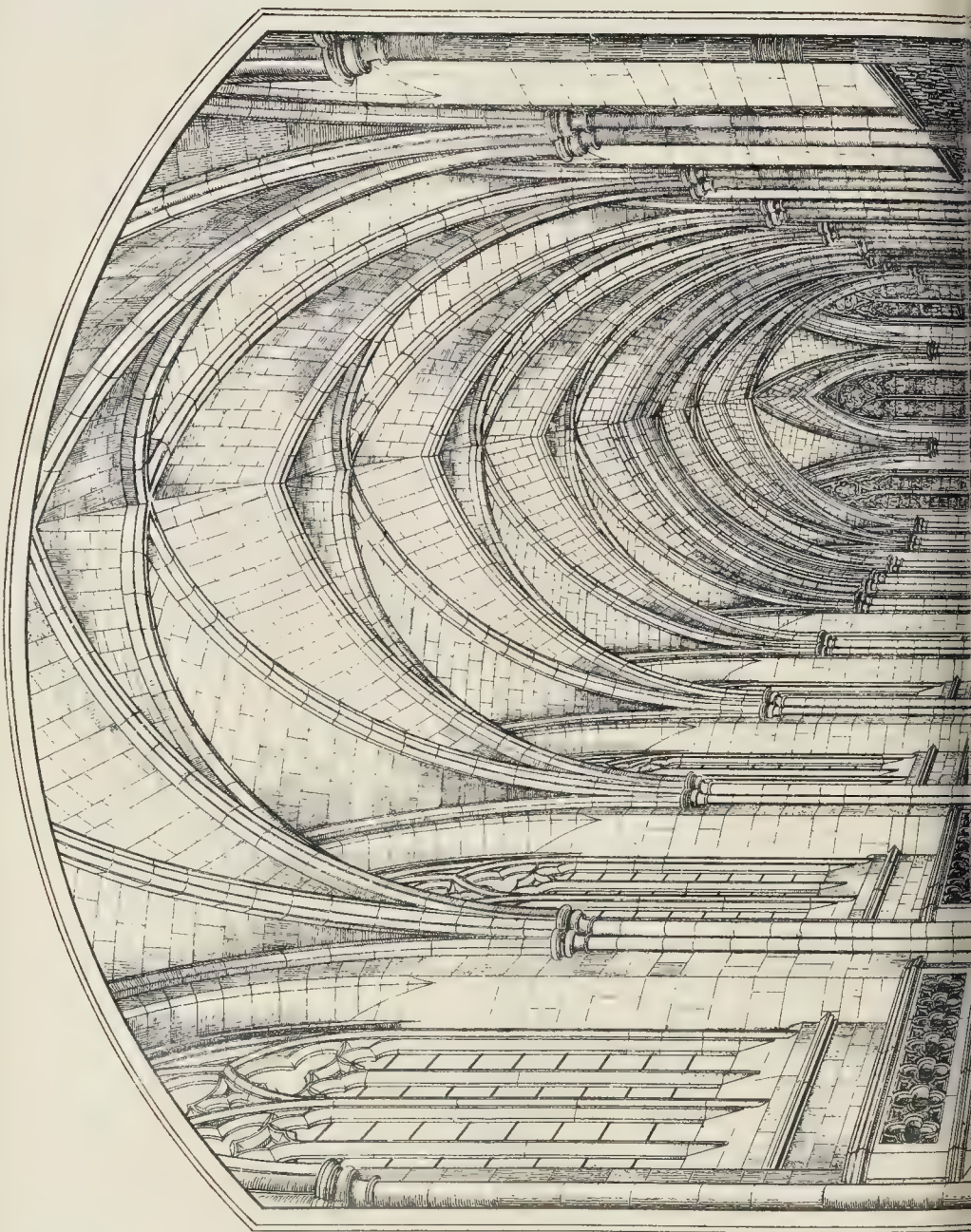
This is a great secret of the success of the old chimneys, and one that is seldom met in new work, owing partly to the natural symmetry that results from the usual arrangement of cottages in pairs.

In the old cottages this disposition is not at all haphazard, but the result of careful study, and it is surprising what a variety of forms are

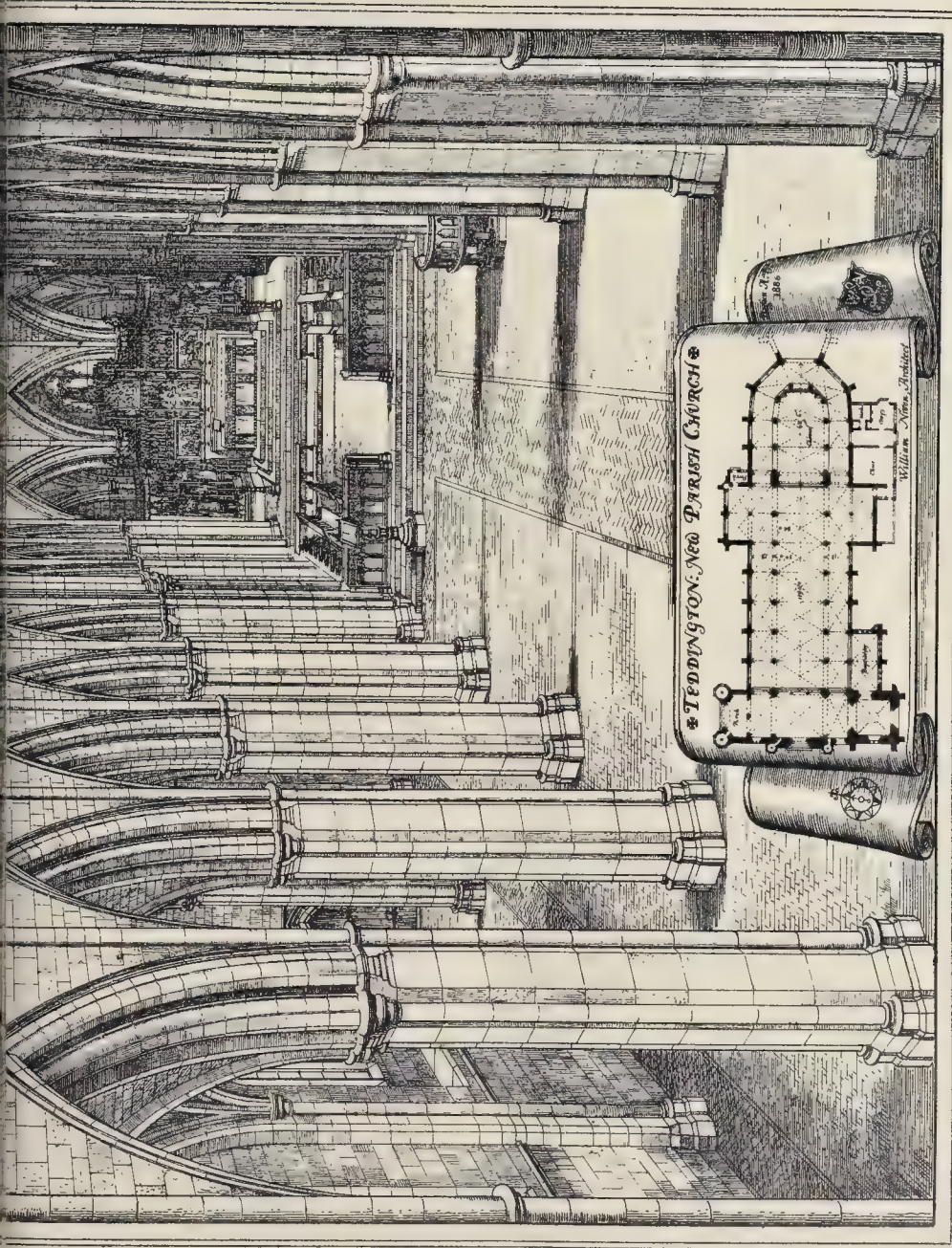




THE BUILDER, SEPTEMBER 29, 1888.



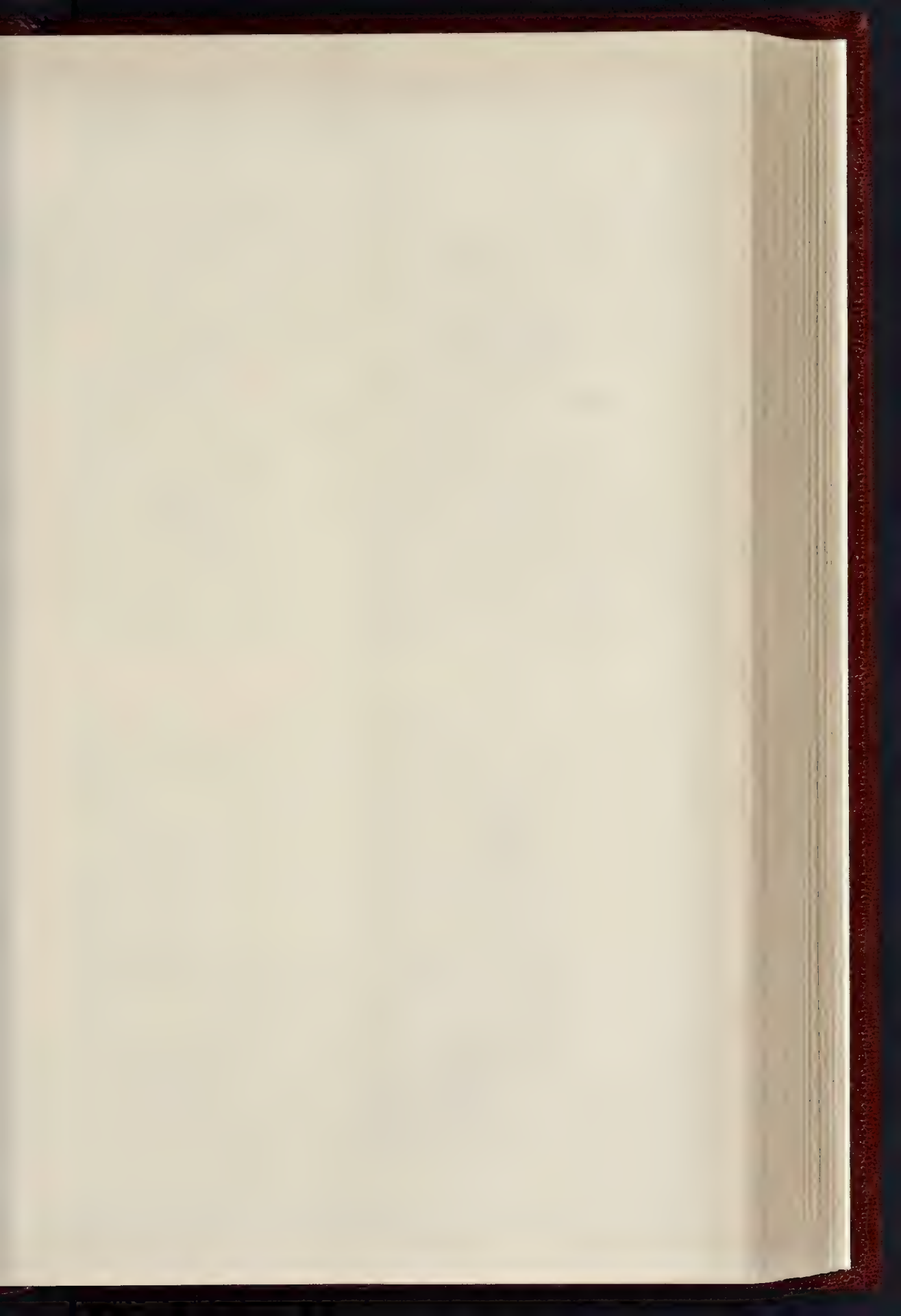




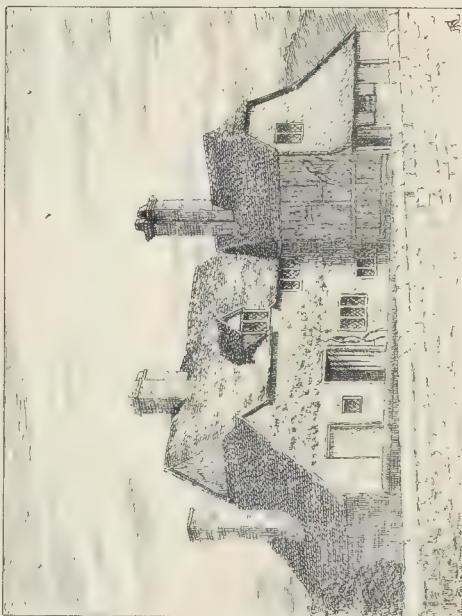
Wm. A. Smith, Architect



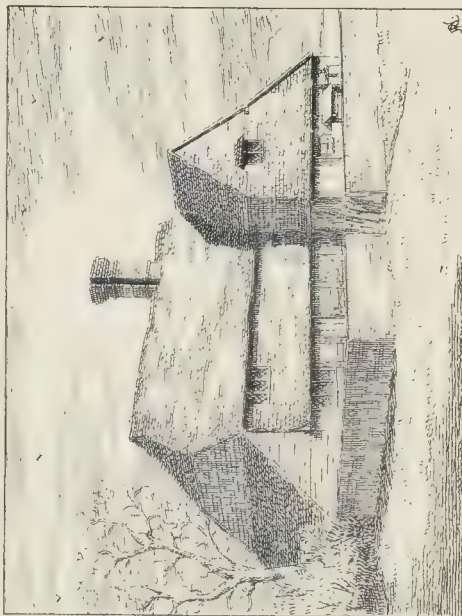




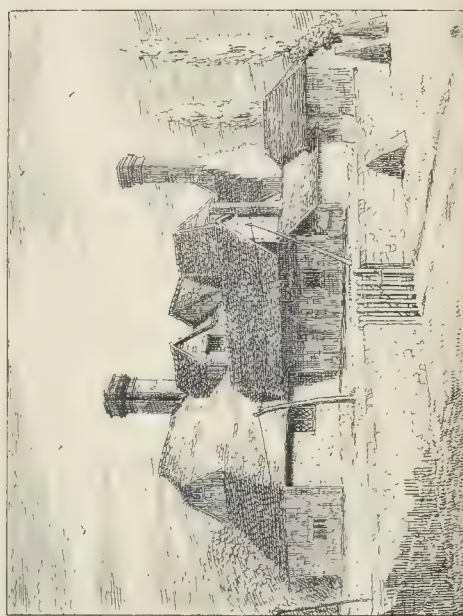
THE BUILDER, SEPTEMBER 29, 1888.



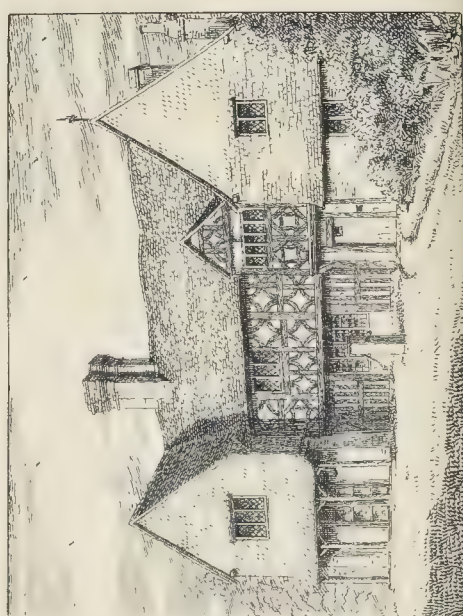
AT SPAN-LEIGH



DUNFOLD COMMON

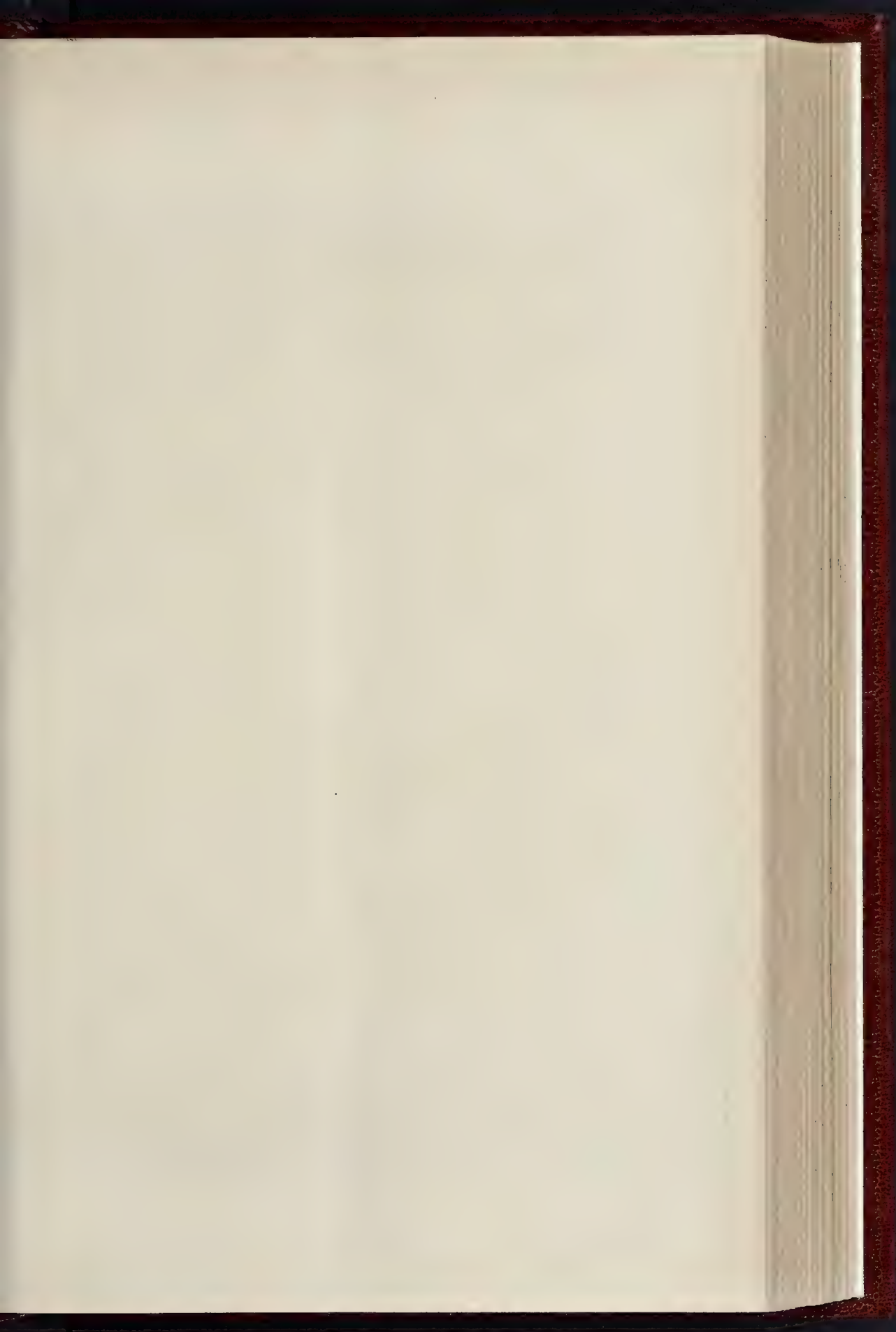


FIELD PLACE DUNSFOLD

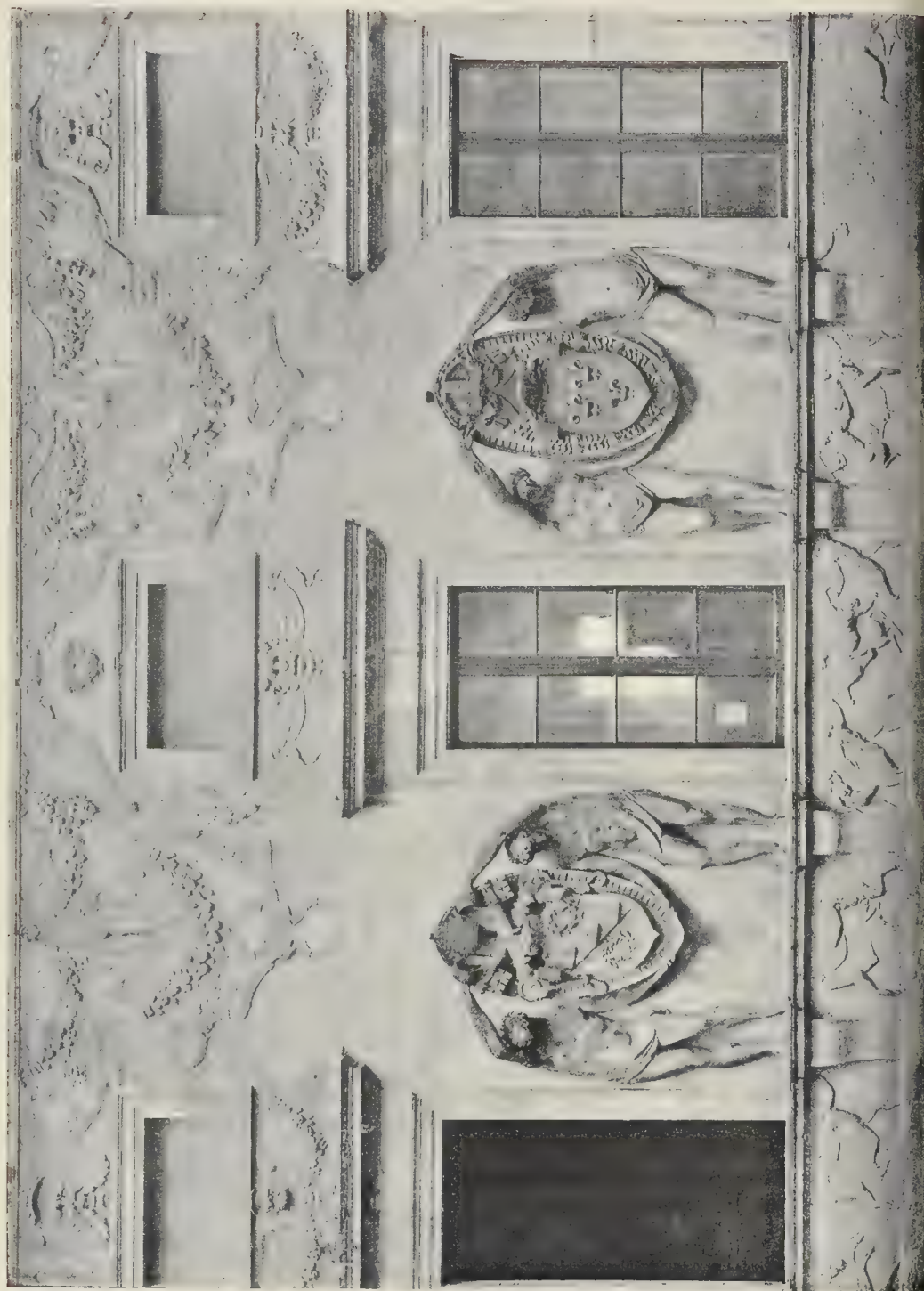


BURNINGFOLD





THE BUILDER, SEPTEMBER 29, 1889.







The Phototype Co., 30 Strand, London.

PART OF MONUMENT, CHURCH OF SAN GREGORIO IN MONTE CELIO, ROME.







AT HIDD NGFOLD



AT CH DDING FOLD



COMBE FARM



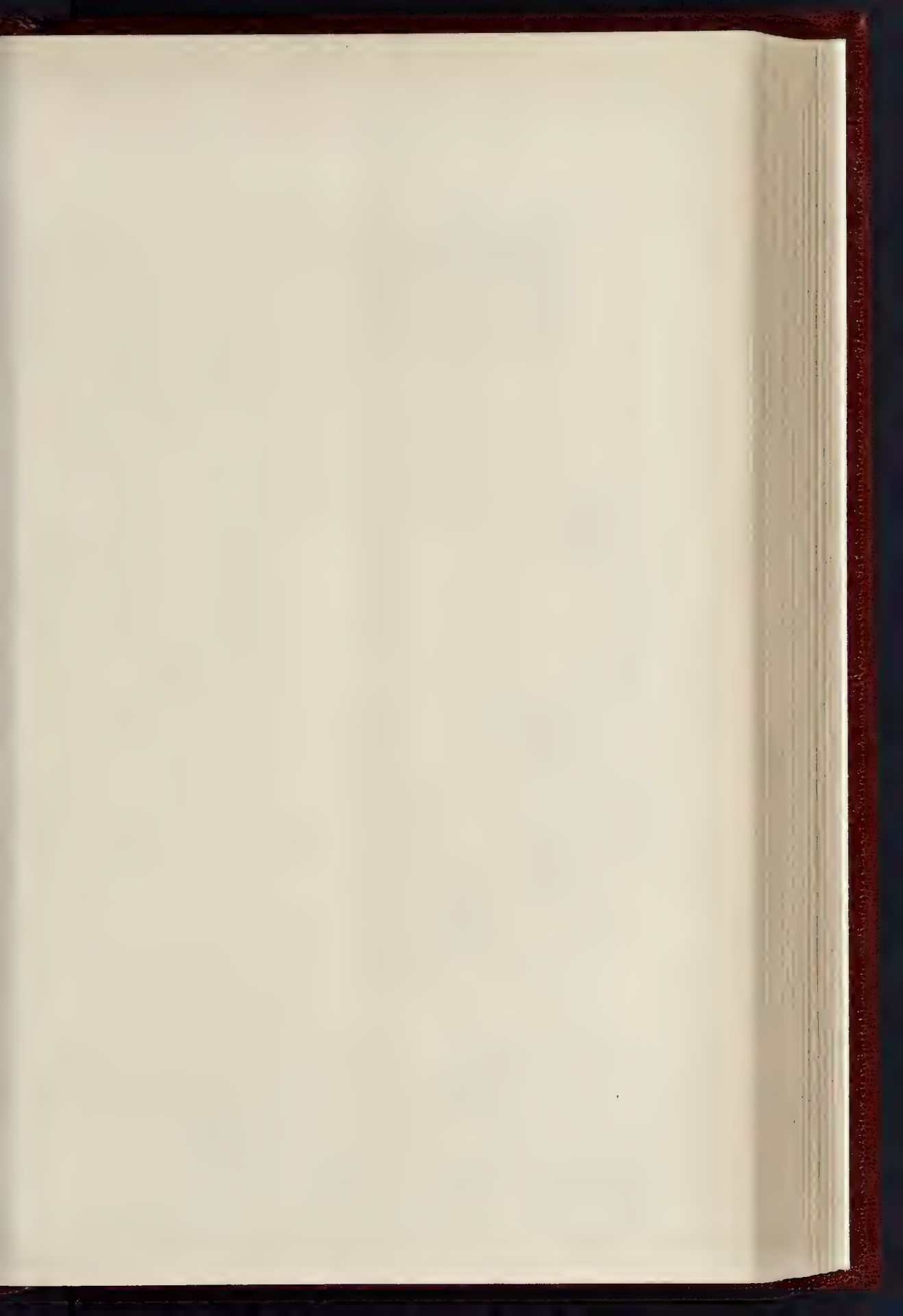
THE CROWN, CHIDD NGFOLD

PHOTOGRAPH BY MR. RALPH NEVILL, F.S.A.

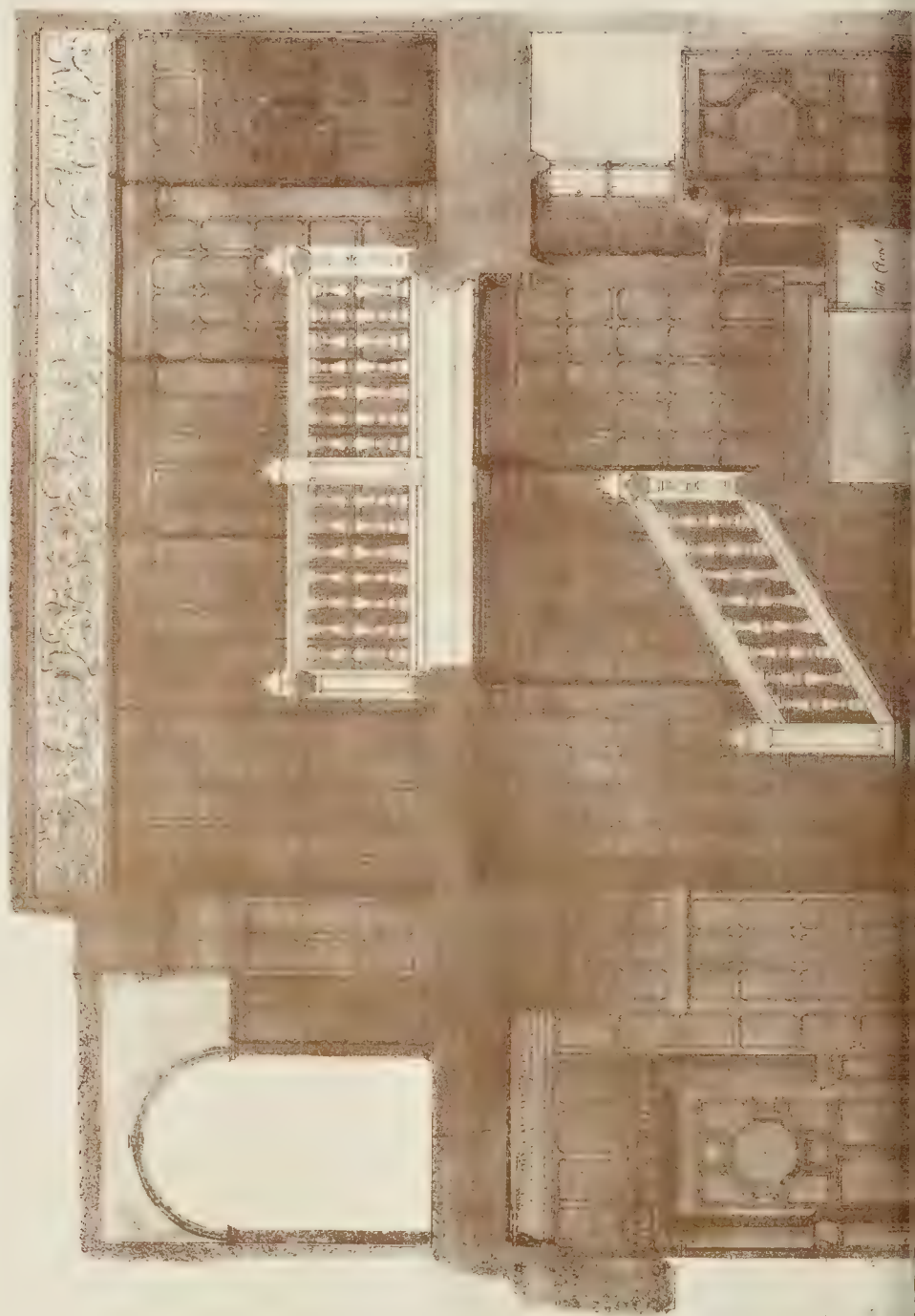
OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.



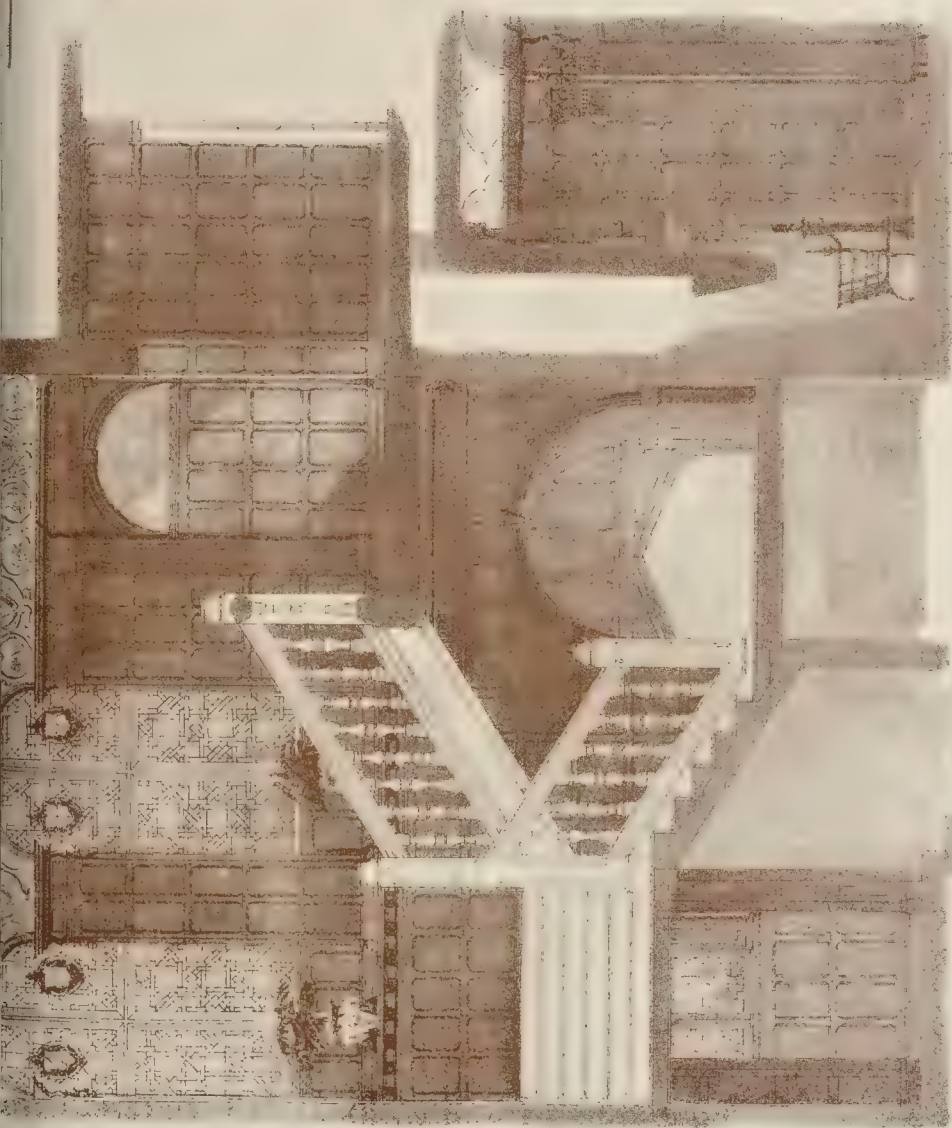




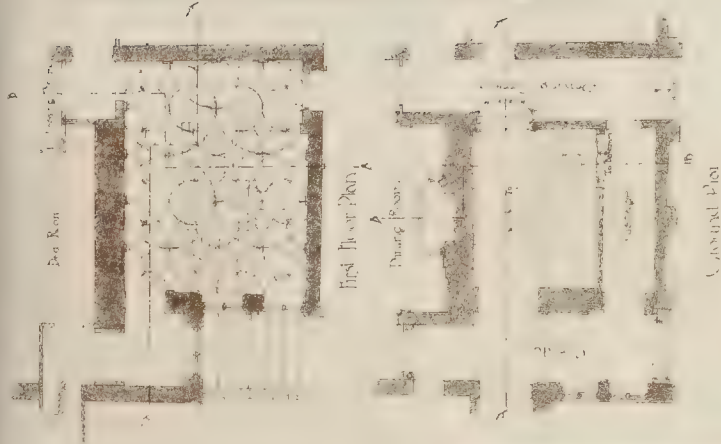
THE BUILDER, SEPTEMBER 29, 1888







Section, line P-D



Plan Room

First Floor Plan

Second Floor

Ground Plan

Stowell Park  
 (Essex-shire)  
 The Principal Staircase  
 by P. Parker  
 Architect





be found. I give three examples (fig. 3) and any others may be found in the lithographed sketches.

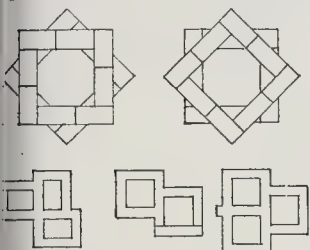


Fig. 3.

The careful manner in which these lines of right and shade are studied may be seen also in the arrangement of the shafts of the chimney. Unstated. The charming effect of such "star" chimneys formed by the crossing of two squares, however, best seen when the shaft is detached and the star complete; there is an excellent example at Womersley. I give a diagram showing the jointing of alternate courses. Another feature to be noted in the roof chimneys is the manner in which when the ridge does not butt against the chimney-block, one side of the roof is prolonged over the ridge till it meets the chimney. The necessity for a gutter between the ridge and the chimney is thus avoided. A striking instance of this is to be seen on the cottage at Easington in my first number, and in a modified agree it is a constantly-occurring and often picturesque feature.

The flues of the larger outside chimneys are 8 in. by 18 in., or 14 in. by 14 in., and of the roof chimneys 14 in. by 14 in., or 14 in. by 9 in., but at Dunsfold are some very elegant shafts that can have only 9 in. by 9 in. flues. Their small size is, however, quite exceptional. An explanation of the sketches I may say that it is common to find shafts of late date carried up from the coppers 12 in. by 12 in. outside, and formed of brick on edge.

A small point not to be neglected is the way course of bricks is always projected where the chimney clears the roof; these courses come naturally at a different height at front and sides, and add to the picturesqueness and still more to the usefulness by throwing the drip clear from the flashing. The flashings are of mortar, and must have been very ineffectual at first. Time, however, has given to mortar as to tiles and bricks a coating of almost invisible vegetable growth that effectually turns the wet. No local brick will keep out the wet, and people are generally aghast at the quantity of water that may be absorbed by new tiles, forgetting that old bricks and tiles were just as bad before they acquired this coating.

While speaking of flashings, I must mention an interesting survival of old ornament in the pattern drawn in the country districts on the flashings with the point of the trowel. This is, however, rapidly becoming an extinct practice.

The heads of the sixteenth and seventeenth century chimneys are usually carefully formed

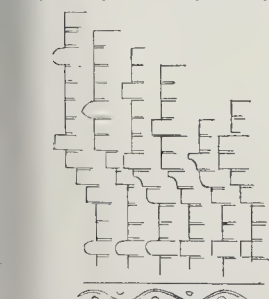


Fig. 4.

of projecting bricks, the number of which and the arrangement vary with the size and importance of the shaft. As a general rule the bricks are square, but occasionally, and especially about Shire, simply moulded bricks are

used. These are the half-round for neckings, the quarter-round, and the cavetto. I give a few examples of heads (fig. 4). It must always be remembered that the old bricks are thinner than the usual modern brick, and if these heads are exactly repeated the effect is much too heavy. This is a fact well understood by such masters of the style as Mr. Norman Shaw, who get over the difficulty by reducing the projection or by using moulded bricks. For the same reason it is dangerous to let the heads follow the projections of the wythes, as is usual in the old chimneys.

The bricks at Unstated are only 2½ in. thick, and four courses do not make a foot; later on the bricks were made 2½ in., and the usual ½ in. joint brought the course to the convenient standard of 3 in. The beauty of old brickwork depends largely on these ½ in. white joints. It is not only the small size of the bricks, but the large size of the joints, that gives the effect which it is so impossible for that reason to achieve in modern work.

This beauty of the white joints has been fully recognised in the charming drawings of Mr. Railton and others, who have made it a leading feature.

I do not think chimney-pots were used on the old chimneys, but the hoods of brickwork often met with may be of old date. Later on, chimney-pots were used, and the ornamental heads reduced to two or three courses at most.

My subjects of this week are taken from a district rich in good examples, namely, Dunsfold and Chiddingfold, in the weald of Surrey. The latter must have been of some little importance, since it is the first recorded locality in England for the glass manufacture, and much glass for Westminster Abbey came from it. There were also very early tile and brickworks in the neighbourhood. Doubtless, the great increase of building in the sixteenth century made the glass trade brisk and the place prosperous.

The Crown Inn is a very old house, and has a fine framed king-post roof over what was originally the hall. The overhanging building at the back is canted in a curious way to follow the line of an old lane or passage; the porch is a recent addition.

The Rev. T. F. Cooper, who is preparing that most useful antiquarian work, an exhaustive parish history, tells me that deeds which he has copied speak of a building here in A.D. 1383; and, no doubt, the hall is that mentioned in these. Another deed of 1548 speaks of the additions lately made to "le Croune."

It is always a sign of antiquity when the corner post has the bracket carrying the projecting framing carved out of the solid. This was managed by using the butts of oak trees placed upside down, and by then carving the spreading bases into corbels. In later times there was a great deal more economising of wood, and of labour, too, and this feature is seldom found. I have, however, found it existing to some extent in internal posts where there was no particular structural object, and it has, I believe, been suggested that the wood dried better when placed in this position. Another sure mark of antiquity is the steep roof, such as that at Combe Farm. Sixteenth century roofs are seldom at a greater angle with the base than about 48 degrees, while the earlier as constantly approach 60 degrees.

The timber house at Burningfold is, perhaps, the best in the district after Tangley, but it has not the rich detail of this latter, nor its picturesque accompaniments. The quarterings are of the circle arrangement, as at Tangley and elsewhere, with another pattern that occurs also at Bramley, as shown in my third number. The room under the rustic verandah contains some good oak panellings.

Field-place I show as a picturesque grouping of roofs. Some former owner commenced to rebuild his old house, but never got further than an odd-looking high block at one end.

The nice little cottage on Dunsfold Common seems doomed to destruction, though by no means in bad condition and desirably situated. The little window in the angle is one of those mentioned previously that have diagonal oak stanchions and no glazing, being closed with a shutter.

This, and one of those at Chiddingfold, and that at Cranleigh, may be compared as variations on the same general plan. The artful way in which the gablet is introduced to the lean-to at the near end of the Cranleigh cottage is worthy of notice.

The addition of tall chimney-pots to this cottage would give it a very good outline.

R. N.

#### THE INSTITUTE ON RESTORATION.

SIR,—I shall be glad to be allowed to correct a misapprehension in your article of Sept. 22, on "Restoration and Ruination." It is there hinted that the paper lately issued by the B.I.B.A. represents chiefly "the judgment of two eminent church architects." Now the facts are these.

Early in last spring, as secretary, I brought before the Art Committee a proposal for issuing a circular on this subject similar to that lately sent out by the Society of Antiquaries, but dealing more practically with the question. The committee adopted the proposal, and at the suggestion, and with the active co-operation, of the vice-chairman, Mr. Herbert Carpenter, I drew up a paper repeating the original circular of twenty years back, but adding thereto such explanations and elucidations as experience had shown were absolutely necessary to prevent great damage that had resulted from a misinterpretation of the somewhat vague terms of that document. On the suggestion of the Art Committee the Council appointed a special committee to consider this draft.

There can be no harm in my mentioning their names, and it is certainly due to the profession that there should be no false idea on the subject that might impair the usefulness of the circular. This committee consisted of Messrs. Christian, Pearson, Blomfield, Carpenter, Loftus Brock, and myself, and may, I think, be considered fairly representative.

The proposed circular was most carefully gone through by each of these gentlemen, and the result as so modified was reported to the Art Committee. They again somewhat modified portions, and it was then adopted with but one dissident, who objected to the form.

It was then sent up to the Council, and after some doubtless unavoidable delay was by them recast into its present shape. I may be excused, as in some way a fond parent, for thinking that they have not improved it, though the alterations are but slight.

I think this history will show that the circular may fairly be taken as expressing the views of those of the Institute who have particular acquaintance with this matter, as each of those who have had a voice in it could probably speak with authority for several others. That there may be many in the profession who will not approve is possible, and there is a possibility, of course, that they may be right, but the balance of authority is certainly with the church architects and antiquaries. This small privilege need not be grudged them; one would not advance their opinions as of particular weight on a question of quantities or of iron construction, as to which one would naturally go to those familiar with their use.

With regard to the policy of the circular, I cannot help thinking that the more close the knowledge of the subject, the more hearty will be its approval.

These are rules for ordinary guidance, and there is nothing in them that would prevent the carrying out of an important work, if it were maturely and deliberately decided on as necessary and desirable. But no one familiar with our country churches can think, in spite of your article, without burning indignation of the wanton mischief that has been done. The whole question turns on whether the historical interests of the Church and its art are not, under the circumstances, worth more than the practice of modern architecture, which, after all, has ample scope side by side with the other. Even the ancients thought their Wolf of the Capitol, and many other archaic remains, worth preserving, though they could certainly have replaced them with better art.

That some things might allowably be destroyed or replaced is quite possible; but then comes in the thin end of the wedge, and in the difficulty as to who is to decide, irreparable mischief is done. Too strict an adherence to architectural principles would dictate our pulling down nearly all the old churches and rebuilding them in a more convenient form. But who will propose this? And yet it is certainly the logical course to take.

For fear of making this letter too long, I must say no more, except as to one little point, namely, that of course, as your note suggests, the reference to floors on the slant is to such as are deliberately and for particular reason so set.

RALPH NEVILL, F.S.A.

\* The "misapprehension" is certainly not our fault; it was distinctly implied, in a letter from the Secretary of the Institute to the *Times*, that the "General Advice" was mainly compiled or directed by two eminent church architects, whose names were given.—ED.



## ANCIENT CROSS AT GLOUCESTER.

## IRISH VERSUS SCOTIC AND SAXON.

STR.—I have seen the illustration of this cross in the *Builder*, and have read the judicious note thereon by Mr. Medland. I have also read the letter on the subject from Mr. John L. Robinson, of Dublin, which appeared in your last issue.

Mr. Robinson's views might have done for thirty years ago, but they will hardly pass at the present time: his knowledge of the history of Irish art and his judgment of its artistic qualities appear to be confused and unreliable.

I should like to ask, in the first place, what is his authority for stating that the cross at Gloucester is "the work of Irish hands?"

In the second, what is his authority for saying Ireland was "then called Scotia"—that is, in the seventh century (A.D. 642, the date of Oswald's death)?

Third, what is the proof that Columba brought Irish artificers with him to Iona?

Fourth, in what respects are the crosses at Monasterboice and Clonmacnoise, identical with the Saxon crosses found at Peterborough?

Fifth, how does Mr. Robinson know that the crosses scattered through England are "Celtic remains"?

To the first question Mr. Robinson cannot be able to give any reply that will support his assertion—for a very good reason. At the date of Oswald's death (642) Irish hands and Irish heads knew nothing whatever about this interlacing ornament. It was not introduced into Ireland till the year 667, when Colman of Iona and Lindisfarne took "alone with him all the Scots he had assembled in the island of Lindisfarne, and also about thirty of the English nation," and settled with them in the west of Ireland. These Scots and English founded the school of art in Ireland, though there were, doubtless, Gothic Scots from Scotland in Ireland before that date.

The earliest Irish sculptured cross whose date can be fixed is that of Thaddeus, Abbot of Clonmacnoise. It belongs to the year 806. It is not likely that even this Irish cross was the "work of Irish hands," for it was the production of the Scotie and Saxon colonies settled in Ireland. Out of compliment to this colony the name Scotia was afterwards sometimes given to the country they inhabited, by their fellow monks of other countries. This name, when applied to Ireland, was quite understood to be a poetical appellation, and not the real name of the country.

Bede always speaks of the country now called Ireland as Scotland, and of the country now called Scotland as Scotland. His editors, however, have been good enough to correct him when he did not err, and in many cases where he has written Scotland they have been so obliging as to write in brackets (Ireland), and thus have done their best to make nonsense of the text. I am quite well aware that Mr. Skene says that "prior to the tenth century the name Scotia was exclusively applied to the island of Ireland," but Mr. Skene is quite wrong in this, as he is when he states that "the name of Scotland, whether in its Latin or its Saxon form, was not applied to any part of the territory forming the modern kingdom of Scotland till towards the end of the tenth century."

Even if this statement were correct, it would prove nothing, for the name "England" is not used at all in the chronicles of those times till the last decade of the tenth century, and was not applied definitely to the territory of the modern kingdom of England till the beginning of the eleventh century.

But it is easy to show from Bede's history that Skene and his followers are wrong in saying that no part of modern Scotland bore the name of Scotland till towards the end of the tenth century.

Bede finished his history in the year A.D. 731, which is considerably before the end of the tenth century. Treating of events which happened in the year 635, he says Oswald, king of the Northumbrians, "sent to the elders of the Scots, desiring they would send him a bishop. Nor were they slow in granting his request, but sent him Bishop Aidan. . . Aidan himself was a monk of the island called Hii (Iona), whose monastery was for a long time the chief of all those of the Northern Scots (b. iii. c. 3). Aidan resided (while in Northumbria) in the isle of Farnie. . . He died in the seventeenth year of his episcopacy. . . Finan, who had likewise come from the same monastery of Hii in the Scottish isle (Iona), succeeded him (b. iii. c. 7). But after the death of Finan . . . when Colman, who was also sent of SCOTLAND, came to be bishop, a greater controversy arose about the observation of Easter (b. iii. c. 25). Colman, perceiving that his doctrine was rejected . . . took with him such as would not comply with the Catholic (or Roman) Easter, and went back into SCOTLAND" (b. iii. c. 26).

Here is another example from Bede (b. iii. c. 21 and 24):—"Diuma died among the Midland Angles . . . and Ceallach, of the Scottish nation, succeeded him in the bishopric. This prelate, not long after, returned to the island of Hii (Iona), which among the Scots was the chief and head of many monasteries. His successor in the (Merician) bishopric was Trumbere, a religious man, and educated in the monastic life of the English nation, but ordained

bishop by the Scots (c. 25). Diuma was made the first bishop of the Mercians; he died, and was buried among the Midland Angles. The second was Ceallach, who quitting his episcopal office whilst still alive, returned into SCOTLAND, to which nation he belonged as well as Bishop Diuma. The third was Trumbere, an Englishman, but taught and ordained by the Scots"—A.D. 662 (b. iii. c. 24).

At this time the Scots kept to the old manner of reckoning Easter, while the newer churches of England and Ireland accepted the method lately enjoined by Pope Honorius.

Coelfrid, a later abbot of Northumbria, writing to Naitan, King of the Picts, who wanted his religion to be of the latest Roman fashion, says:—"This I said to Adamnan (abbot of Iona), who indeed showed how much he was improved upon seeing the statutes of our churches, when, on returning into SCOTLAND, he afterward, by his preaching, brought great numbers of that nation over to the Catholic (Roman) observance of the Paschal (Easter) time; though he was not yet able to gain the consent of the monks that lived in the isle of Hii, over whom he presided" (b. v. c. 21)—A.D. 710.

The entry in the Anglo-Saxon Chronicle for the year 933 reads:—"This year King Athelstan went into SCOTLAND, as well with a land army as with a fleet, and ravaged a great part of it."

England is first mentioned in the same Chronicle sixty-two years later; that is, in the year 995:—"This Africa was a very wise man, so that there was no so eager man in England." This is vague, and may mean anywhere; the next is better defined:—"A. 1002 . . . the King ordered all the Danish men that were in England to be slain."

The name "England" does not occur at all in Bede's history, which was completed in the year A.D. 731. He mentions the English race, the English nation, the West Saxons, the East Saxons, the Midland Angles, Bernicians, and Northumbrians, but Britain, never England, is the usual territorial name in all Bede's history, as well as in the Saxon Chronicle up to the beginning of the eleventh century.

Ireland is mentioned about a score of times by Bede, and always Ireland, not as Scotia. The Anglo-Saxon Chronicle mentions Ireland only as Hibernia, and several times as Ireland, not once as Scotia.

Bede, on whom the Celts rely for support, gives them in reality very little, but Bede's editors give them abundance. In most of the headings to the chapters, which are not by Bede, but a later hand,—"Scotland" is substituted for Ireland. Thus, in b. iv. c. 4, we read in the heading that Colman "built two monasteries in Scotland." In the text itself we find that "he retired to a small island to the west of Ireland," where he built a monastery, and another on the mainland of Ireland. Bede, from this treatment, is, to a careless reader, a mass of confusion. Scotland and Ireland are, at first sight, inextricably mingled; but a very little study enables us to separate the chaff of the editors from the wheat of the author.

Some of the pious endeavours of his editors seem to have arisen from their desire to make Bede's history in accordance with the fictitious early Irish Christian civilisation claimed by the Irish writers.

Ireland has undoubtedly traditions of early history and civilisation which stretch back to the Flood. These traditions are coherent, and quite reconcilable with the facts obtained from independent studies of race migrations; but they all refer to a period long before the Christian era. This ancient civilisation, if it ever existed, was swept away by the many waves of invasion to which Ireland had been subjected. Ireland, from some time before the Christian era up to the coming of St. Patrick, was in anything but a civilised state, if we may credit the Greek and Roman writers who have condescended to notice it.

Strabo says the Irish are savages more wild and unpollished than the Britons. Mela that they are the most uncivilized of all nations. Solinus calls them "a nation void of humanity, unhospitalable, and in every way barbarous and atheistical." These are, no doubt, exaggerations; but if the Irish, in the early centuries of the Christian era, "were the generous, polite, and literary people" our Celts think they were, it is impossible to imagine that the unbiased classic writers could so grossly misrepresent them. The evidence of Nennius goes to show that the Irish were entirely heathens when St. Patrick, in 452, left Scotland to go among them. Columba built a monastery in Derry previous to the year 565, and in 607 Colman built two monasteries, one for the Northumbrians and one for the Scots. These last formed a school of art and religion, which flourished till the interference of Henry II. of England in the twelfth century began to reduce Ireland again to savagery. Irish Christian civilisation began in the fifth century with the preaching of St. Patrick; its Christian art began in the seventh century. Christian art and culture did not come from Ireland to Scotland or Britain, but were brought from Ireland to South Britain and to Ireland. This is made clear enough by the study of the histories of Bede and Nennius, and the Anglo-Saxon Chronicle. None of these books can be said to be biased in favour of the Scots of Scotland.

In the year A.D. 156, Lucius, king of the Britons, sent a letter to Eleutherius, who presided over the Christian Church at Rome, asking that he might

receive the Christian faith. The faith thus introduced was preserved in peace and tranquillity up to the time of the persecutions by Diocletian (Bede, i. c. 4, 6).

In 394, St. Ninian went as missionary from Rome to the southern Picts or Scots, and converted them to the faith. He built a church in Whitburn, Wiltshire (Bede, b. iii. c. 4, and "Anglo-Saxon Chronicle, 565).

In 430, Palladius was sent by Pope Celestine to the Scots, who believed in Christ, to confirm the faith; he died in the land of the Picts at Ford in Scotland (Bede, b. i. c. 14, Anglo-Saxon Chronicle, 430). One of the editors of Bede's history commenting on Palladius, and with a fine feeling for hazy effect, mixing him up with St. Patrick, says, "Palladius and Patricius have sometimes been confounded together, so that it is difficult to assign to each his respective share of merit in the conversion of the Scots of Ireland." As Fordun, in the land of the Picts, and not in Ireland, Palladius never set foot on Irish soil, St. Patrick is known as the peculiar apostle of Ireland; it is not so difficult to separate Palladius from Patrick as the learned editor seems to imagine.

Nennius tells us, "The death of Palladius being known . . . Pope Celestine sent Patrick to divide havoc with those of the Briton churches . . . he arrived in Britain, where he preached some time . . . Having filled his ship with foreign gifts and spiritual treasures by the permission of God, he arrived in Ireland, where he baptised and preached." A.D. 452.

As this is absolutely the first mention of Christianity in connection with Ireland, it is obvious that the Scots were later than the Briton-Roman Scots in receiving the Christian religion. According to the Anglo-Saxon Chronicle, "in the year 561 Columba came from the Scots among the Britons, to instruct the Picts. Bede calls them "the northern Picts, who are separated from the southern Picts by rugged mountains; for the southern Picts, those men who dwell on this side of the mountains, had long before, as is reported, forsaken their errors of idolatry, and embraced the truth by the preaching of Ninias (A.D. 394)." (Bede, b. i. c. 4.)

While the Christian churches in Scotland were being thus settled and confirmed, the Saxon was being introduced into Britain, and the Roman church in South Britain which had survived the persecutions of Diocletian; it may be said that Christianity appeared as the Saxons established themselves. A partial revival took place in Kent in the year 597 and in 598 St. Augustine was sent to the same district. On his journey, he and his companions were resisted by a sudden storm, and began to think of returning home, rather than to brave barbarous, fierce, and unbelieving nation. (Bede, i. 2) In 635, Oswald, King of the Northumbrians, who had been a refugee in Scotland, and was baptised there, asked the Scots to send him a bishop to convert the Northumbrians. Aidan, from Iona, went; when he died, he was succeeded by Finan, whose successor was Colman. All these three were Scots, educated at Iona. (Bede, b. iii. c. 3, 17, 20.) The first two bishops of the Mercians, Midland Angles, were also Scots from Iona. The third was an Englishman educated in Scotland (b. iii. 24).

Early religious culture, we see from these extracts, produced in Scotland, and was not imported from Ireland. Artistic culture in Britain and Ireland also came from the same source.

Scotland possesses monuments which are believed to have been erected in a period before the Christian era; many of them are certainly pre-Christian. The earliest of these sculptured stones are found in the country between the Dee and the Spey, while the boundary between the Dee and the Tay belong to a somewhat later, but still very early, period. When Columba obtained from the Pictish king the island of Iona he without doubt carried with him, among his converts, to the island, Pictish artificers and artists. Iona does not present any of the earlier forms of Pictish sculpture, it is evident that the style had made great progress before the coming of Columba and had developed the interlacing knot-work which is not seen in the earlier form of Scotie art. Iona was not only a school of religion, it was also a school of art. When Aidan, Finan, and Colman went, successive bishops to Northumbria, they introduced not only the religion but the art of the Scots. The "Gospels of Lindisfarne," which were executed in Northumbria during their episcopal rule, are at present. The earliest sculptures of Northumbria have all the characteristics of the Scotie crosses of the middle period; Northumbrian sculpture, however, develops later into the Anglo-Saxon style, which there is a strong infusion of Byzantine or Continental art.

When Colman, the third bishop of Northumbria refusing to accede to the newer Roman style of calen-

\* South Britain at this time was in a very unsettled state and almost entirely pagan.

\* The early monuments of Scotland have no Christian art; they are carved with hunting and battle scenes; they are not pierced, but are solid slabs. The Irish crosses, corresponding with the later Scotie monuments, are pierced, and have usually Biblical subjects. \* Early crosses, or small works in metal, found in Ireland prove nothing; as they may have been imported from other countries. The oldest, the Gospel of Patrick would be carried by Patrick into Ireland.



ing the time of Easter, resigned his bishopric and went back to Scotland, "he took along with him all the Scots he had assembled at Lindisfarne and also about thirty of the English nation, and leaving some others in his church, he repaired first to the island of Hii (Iona), whence he had been sent to preach the word of God to the English nation. Afterwards he retired to a small island which is to the west of Iona." On arriving there, he built a monastery, and placed in it the monks he had brought of both nations. Owing to the travelling propensities of the monks, the two nations did not agree, and Colman built a monastery for the English monks at Mago, now annexed to the archbishopric of Tuam, while the Scots remained in the monastery on the island of Iona.

Thus the arts of Iona and Lindisfarne were introduced to Ireland, and thus Irish Christian art took rise. Ireland can show no specimens of sculptured Christian art done previous to this date, and the strong resemblance which is observable between the various phases of Celtic art and the art of Ireland due solely to the fact that the so-called Irish, or Celtic art, was introduced by Scottish and English monks working in Ireland. The later Irish art may have been done by Scots or Angles or by Irishmen who reproduced and developed the Celtic designs which had been introduced by Colman and his Scottish and English monks. The incontrovertible fact remains that all Irish Christian art is due directly or indirectly to the Celtic school art established in Iona. This in its turn was at first a direct reproduction, and afterwards a development, of the Celtic and Pictic art which had been created in pre-historic time in the northern districts of Scotland. Probably this in its turn was a development of the Danian art, and was introduced into Scotland by the Picts, who are generally believed to be of Scandinavian origin.

Now, it is clear that if the bishopric of this interesting work is to be found in the Gothic provinces of Iona, and a connexion is established between these provinces and Scandinavia, it can scarcely be correct to speak of these works as Celtic. (The Celts who reached England about 350 years before Christ came from Celtic Gaul; they never had any settlement in Scotland north of the Forth and Clyde; for the reason that they were opposed by the fiercer Goths, who had descended on Scotland from the north and east. The Gaels or Highlanders are not Celts or Goths, but are relics of an older race, who had possession of all Britain before the coming of the Goths and Celts. The true Gaelic dark, the Goths and true Celts are both races of Celtic origin, and are, or were, light complexioned. Cusar confounds the Goths with the Celts, and has thus brought confusion into the matter. The Gauls of France, the dark-haired Celts of Wales, and the Gaels or Highlanders of Scotland are allied races,—of prehistoric settlement in their respective countries. The Celts only made their appearance in Western Europe in 50 B.C.)

If this ornament were of Celtic origin, we should find it in all its phases in Celtic or North-western art, or in Celtic Wales; but it is very uncommon in these countries, and the specimens existing can be traced directly to the influence of Scotch, Gothic, or Norse invaders.

Further, the people who executed the works in Ireland do not seem to have been Celts, but Gothic, Norse, and Saxons.

According to the last book on the subject of early Christian art in Ireland, "There is no evidence whatever to prove that such sculpture as we find upon the high crosses in Ireland was executed before the tenth century. The ornament upon the sepulchral slabs, which date from the seventh to the tenth century, is included."

The date of these fine monuments (the high crosses) in Ireland may be limited to a period ranging from the tenth to the thirteenth century." This deduction agrees perfectly with the true history of the introduction of the art as revealed by a study of Bede.

Will Mr. Robinson explain how work executed from the tenth to thirteenth century in Ireland could have formed the models for work done in the seventh and preceding centuries in Scotland and England? This is virtually what the Irish claim.

J. MOYR SMITH.

## GLASGOW DRAINAGE AND THE POLLUTION OF THE CLYDE.

SIR,—I read with much interest the instructive article upon this subject in your issue of the 15th inst., and think that, as regards Glasgow, the following words from page 187 are particularly applicable, viz.:—"The problem of ridding a large town of its sewage did not admit of an economic solution." On page 189 the plan of keeping the sewage out of the river and discharging it into the sea on the Ayrshire coast is recommended as the best and most economic in the long-run.

Until it is able to face this, Glasgow may as well do nothing but rest on its oars, watching the result of the London experiments, &c.

Some people have been trying to put pressure upon the Glasgow authorities to hurry on with the purification of the Clyde, on account of the damage asserted to be done to Loch Long and its

shores by the deposit of the present dredgings at the mouth of the Loch; but I consider that, supposing the deposit of these dredgings in Loch Long was stopped to-morrow, there would be no appreciable benefit to either the Loch or its shores. The greater part of the dredgings is merely sand or clay and stones, and these are deposited where the water is about 200 ft. deep, and about three-quarters of a mile or so from the shore, and do no harm. I boarded a dredger lately which was lying undischarged at the mouth of the Loch, and took the stuff into my hands, and it had no bad smell, nor was it at all offensive, being simply sand with a mixture of clay in it, which, of course, discoloured the water. The chemical refuse that was discharged previous to Mr. Fletcher's Report in February last was offensive, but it is now stopped, and I understand the fishing this season in Loch Long has been exceedingly good. The depositing of the dredgings in Loch Long is not, therefore, a crying evil, but the filthy state of the river at the harbour, and for several miles below it, is the real nuisance for which a remedy is wanted.

Sept. 22, 1888.

W. P. BUCHAN.

## A FORTH AND CLYDE CANAL.

SIR,—Reverting to this subject, the nation ought to feel indebted to you for your elaborate and powerful article (Sept., 1884) in favour of a grand State canal between the Forth and the Clyde, deep enough for the largest merchant steamships and available for warships, which I understand can be formed for 8,000,000*l.* or so; that is, it would cost, with a trifle for repairs, at the present rate of borrowing with such security, only about 250,000*l.* per annum—a mere nothing, compared with its commercial utility, apart from its being of vital advantage in war-time (which may be approaching all too soon), looking to our creditable, inflated unpreparedness.

R. A. MACFIE.

## DISSENTING CHURCH BUILDING NEWS.

**Leeds.**—A new Wesleyan Chapel in Dewsbury-road, Leeds, the foundation-stone of which was laid in October of last year, was opened on the 12th inst. The chapel has been built of pressed bricks, with stone dressings, in the Italian style of architecture, and is arranged to accommodate 800 adults. It is 75 ft. long, 48 ft. wide, and 33 ft. from floor to ceiling. The entrance to the ground-floor is from a front central lobby connected with two inner lobbies communicating directly with the chapel. Access to the gallery is from two side entrances also at the front, by means of stone staircases. The wood-work internally, including the pulpit, is of pitch-pine varnished. The ceiling is panelled and enriched in plaster, and finished with a cove next the walls. The architect was Mr. G. F. Danby, of Leeds, and the total cost, including the land, is about £4,200.

**Leytonstone, E.**—In April plans for the Wesleyan Chapel extension and schools were invited in competition from six architects, and on the advice of the referee those submitted by Mr. George Baines, London, were selected. Since this decision the committee have purchased an adjoining house, and propose to carry out a much larger and more comprehensive scheme in sections, from the design of the above-mentioned architect. Tenders for the main school-room and chapel extension have been accepted, the work to commence on the site March 1.

## The Student's Column.

### ARTIFICIAL STONES.—XIII.

*Concretes (continued).*

**B**UILDINGS formed by the compacting together forcibly of successive layers of béton by means of rammers are numerous and important, especially in France, and each structure is a veritable monolith,—a true concrete building,—which, as the late Mr. Geo. Godwin remarked some years back, is a very different affair from one formed of concrete blocks. A modification of the process for wharfs, dams, &c., consists in making the walls hollow or honeycombed, and filling in with earth or other cheap material. Iron scraps, double-headed nails, or skeleton metallic frameworks may also, in certain cases, be imbedded in the structure while it is being formed. Another of Coignet's mixtures was formed by grinding up 10 parts of unslaked lime with 3 to 4 parts of water, and then mixing with 40 to 60 parts of dry sand and two and a half to 10 parts of hydraulic cement;

the ingredients are well pounded together and rammed into moulds. In some instances M. Coignet recommended the addition of a small quantity of super-phosphate or bicarbonate of lime to the water to assist the induration. It is stated on good authority that, by manipulating as M. Coignet directs, a very good quality of concrete can be obtained from an indifferent lime, whereas in ordinary concretes the very best lime obtainable must be used.

To briefly summarise the remaining concrete-like mixtures, we commence with Bousfield's, patented in 1856, and which was composed of from 80 to 85 parts of chalk and from 15 to 20 parts of slaked lime, and just enough water to make the particles cohere; the mixture was then pressed into moulds, and when dry enough removed and exposed to the air.

Ellis's Artificial Stone (1857, pat. 1389) also utilises a mixture of chalk and lime in fine powder, with or without the addition of other stone, burnt clay, or hard material of a suitable nature; the mixture decided on is slightly moistened with water, and submitted to great pressure in moulds.

In 1858 provisional protection only was granted for a mixture of white marble, 2 parts, and lime, 1 part. A few years later another, containing much carbonate of lime, was patented, and was composed of limestone 4 parts, chalk lime 1 part, stone lime 1 part, and sand 4 parts. A material termed "concrete marble" is formed by mixing milk of lime with finely-powdered marble, limestone, or chalk to a pasty consistency, then adding a certain quantity of coarse granular limestone; the mixture hardens quickly, and is fairly durable. Barteau, Corroy, & Guy's artificial stone was formed of any hard material of little value, broken in small pieces and bound together with a cement composed of 20 parts of hydraulic lime, 30 parts of Roman cement, 10 parts of either oxide of iron or iron filings, and 40 parts of rough broken plaster worked up with water to the consistency of mortar. Standfast's improved compositions, patented in 1861, were made up of burnt clay or loam, iron dust, brick rubbish, gravel, hoop iron or wire, lime-cement, vegetable fibre, and sand; the mixture was incorporated with water and run into moulds or hollow frames. Berren's "factitious flagstones" have no particularly novel features, being composed of fragments of hard stones, such as quartz, basalt, &c., bound together with mortar or cement, and allowed to harden in moulds of suitable form.

Bodmer's "stone bricks," used to a considerable extent about twenty-five years ago, were composed of lime and sand, or of lime and powdered slag, or furnace clinkers.

In Messrs. Bodmer's process, patented in 1863, the principal feature of novelty consists in forming a new cement by grinding lime and cement, or both combined, with a certain proportion of slag and stone in a dry state, and subsequently mixing this cementing material with coarse sand, slag, or broken stone, and the necessary amount of water. Adamson & Bird, in their patents, aimed chiefly at the production of smooth surfaced concrete by employing glass, slate, enamelled iron or stoneware to form one or more faces of the mould.

J. McDonald's patent stone, composed of sand, gravel, broken chips and flakes of stone formed into blocks with cement, calls for no special comment.

One of the leading authorities on this subject recommended, some years ago, a concrete composed of 1 part of Portland cement to 7 parts of material consisting of clean Thames gravel, crushed slag and clinkers, crushed bricks, oyster shells, hard core, &c.; the mixture is to be used with hoop-iron bonds, and the greatest care taken to avoid the presence of loamy matter and dirt in the mixture.

The use of cements containing carbonate of barium ensures, according to Mr. H. Reid, a far better result than is possible with ordinary Portland cement.

A good concrete is made by mixing 100 parts of hydraulic lime, which has fallen to powder, with enough water to form a paste; to this is added 250 parts of gravel and 50 parts of coal ashes; the mass is then thoroughly mixed, and sufficient water added to make it fairly plastic.

Hill patented in 1877 the employment of a mixture of 1 part of Portland cement, 2 parts of lime, and 2 to 4 parts of shingle or sand, with a metallic oxide or pigment if desired.



## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

13,180, Manufacture of Cement. J. Hargreaves.

By this invention building cement is made from waste materials. Clay or suitable aluminous material is mixed with carbonate of lime, obtained by passing carbonic acid through alkali waste until the sulphur existing in the waste in the form of sulphide of calcium is eliminated, by mechanical means, after which it is burnt in the usual way. Coal-mine clay is used, and the heat obtained from the carbon in the waste and clay is utilised. Sand is added where necessary.

13,740, Fireproof Curtains. C. M. Duplany. By means of this invention a double fireproof curtain is made of woven asbestos sheeting. This consists, as it were, of two curtains, one forming the back and the other the front, with an air-space of about 6 in. between them. The back and front are connected by strips of asbestos-sheeting arranged vertically in pairs from top to bottom at convenient distances apart. The curtain is counterbalanced by weights, and is automatically fastened and released by bolts actuated by springs, but controlled from near the prompter's box by levers, &c.

14,281, Fireplaces. J. B. Petter. This patent consists principally of a metal plate, with or without tiles, which forms the hearth. This has a narrow grating around and immediately inside the position for the outer edge of the curb or fender, for the admission of air from a chamber underneath, the plate being applied in any way which ensures the distribution of fresh air obtained from outside the apartment. The asphalt and grating is formed in or on the hearth-plate.

14,431, Ventilators. J. W. Gibbs. By means of this invention, which consists of mica flap or exit ventilators, noise is prevented by forming one or both the surfaces liable to come in contact, of a soft non-inflammable material, which, as it were, cushions the blow and obviates the noise. The flap itself is made of asbestos millboard or card, and fastened by a staple. The ventilator is noiseless, because the asbestos backing is of a soft and yielding nature and butts against a frame lined with similar material.

7,815, Lock Bricks. J. K. Champion. The bricks, which are the subject of this patent, are made like ordinary bricks, but have a dovetail-shaped opening in one side, whereby one brick is locked to another similar brick placed parallel with it, by means of a cross-brick or tie made to fit into dovetail openings. On the upper part of each brick also is a longitudinal bead, and in the under part a longitudinal groove to fit the bead for the purpose of locking one another. When used as quoins, a return or right-angled bead and groove only is used.

10,580, Hinges. W. P. Thompson (Ducker, New York).

This idea is to produce a hinge of simple construction, such as can be very cheaply made, and easily applied to boxes. It holds its place firmly, and is less likely to work loose than those of ordinary patterns. It consists of wings laid upon or let into the structure, arms at right angles to these, and a pin which unites the said arms. The hinges may also be fixed with staples, where such is most convenient.

## NEW APPLICATIONS FOR PATENTS.

Sept. 14.—13,805, A. Boulé, Wood Planing Machine.—13,818, C. Anderson, Burglar Alarm.

Sept. 15.—13,319, A. Greg, Self-acting Machine for Sawing Timber, &c.—13,321, F. Helps, Imitation of Inlaid Work in Wood or other Material.—13,327, H. Waddington, Draught-preventers for Doors or Windows.—13,344, W. Youton, Sliding Window Sashes.

Sept. 17.—13,380, J. Pickering and E. Sant, Automatic Gate for Protecting Well-holes of Lifts.—13,386, E. Robbins, Crystal Coagulations, Silicified Concrete or Vitreous Manufacture for Building, &c.—Primary Lights.—13,393, R. Hooking, Self-flushing Apparatus for Sewers, Drains, &c.—13,430, C. Merchant, Cows for Ventilators and Chimneys.

Sept. 18.—13,443, A. Caldwell, Controlling Regulating the Flow of Water into Houses, &c.—13,478, J. Wilson and L. Constantine, Veneers.

Sept. 19.—13,505, T. White and J. Beal, Gas-pipe Hooks.—13,509, J. Shanks, Siphonal Cisterns for Water-closets, &c.—13,517, E. Smith, Catch for Locks and Latches.—13,525, W. Ralston, Wall-papers.—13,528, J. Twichin, Convertible Window-sashes.—13,538, W. Howcroft, Paint Brushes.—13,540, S. Williams, Burners for Heating Lime-kilns, Brick-kilns, &c.

Sept. 20.—13,561, J. Gamlin, Chimney-pieces.—13,562, J. Hartford, Sewer-pipes.—13,585, J. Coulter, Building Block or Brick.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

16,041, R. Reeves, Construction and Ventilation of Soil-pipes, House Drains, &c.—10,409, S. Williams, Bolts for Doors, &c.—11,248, E. Darley, Panic Bolt for the Doors of Theatres, &c.—11,249, W. Ross, jun., Siphon Drain-pipes and Connections.—11,306, W. Howard, Window-fastenings.—11,400, C. Priestley and S. Gurney, Wood Block-flooring.

—11,462, B. Cassidy, Corrugated Sheet Metal Roofs.—11,473, J. Davies, Brick-kilns, &c.—11,536, W. Verity, Operating Window-sashes.—11,587, A. Hardy, Alarm Bells for Doors, &c.—11,759, T. Bates, Flap Ventilators.—11,805, G. Sator and F. Baker, Sash-fasteners.—12,287, H. Green and A. Sterkman, Stoves.—12,541, J. Cook, Water-closet Apparatus.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

14,554, R. Lee, Fireproof Building Materials, &c.—14,716, A. Hopkins, Fastening and Securing Wood Block, Flooring, &c.—15,969, B. Henley, Outlet Valves for Sewer-flushing, Tanks, &c.—15,981, J. Eardson, Double-flush Water-waste preventing Valves.—16,042, R. Peel, Top Bars for the Ribs of Fire-places.—16,093, J. Stevens and C. Major, Hydraulic Lifts.—372, W. Gibbs, Glazing.—7,669, H. Miller, Attaching Sash-lines to Window-sashes.—10,146, F. Henninger and J. Fyfer, Sash-fasteners.—11,271, C. Kinnell and G. Rothnie, Balancing and Opening Sashes, &c.—11,762, E. Emanuel, Man-hole Cover for Sewers and Drains.—11,909, J. Stephens and R. Clark, Portland Cement.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

|                                                                                                |         |
|------------------------------------------------------------------------------------------------|---------|
| By SIMMONS & SON.                                                                              |         |
| Oxon, Shipplate—"Shirley Court Farm," and 362a, 2r. 24p., freehold .....                       | £13,000 |
| Isleworth—"Grove House," with grounds, freehold .....                                          | 1,050   |
| By Messrs. CHENEY.                                                                             |         |
| Lewisham—Three freehold cottages in Blackhaw Alley .....                                       | 305     |
| Ightham, Kent—Freehold house, cottages and freehold land, 8 acres .....                        | 3,000   |
| By E. E. CAUCHES & CO.                                                                         |         |
| Willesden—13, Percy Villas, 88 years, ground-rent £5 .....                                     | 125     |
| By REXFORD, BURD, & PAYNE.                                                                     |         |
| Finchley, Leicester-road—"Rushion Villa," freehold .....                                       | 355     |
| Park Hall-road—Ten houses, 95 years, ground-rent £63. 10s. .....                               | 3,350   |
| By A. SPAIN & SON.                                                                             |         |
| Poplar—1 to 4, Sophia-street; and 1, 2, and 3, Elizabeth-terrace, 75 years, ground-rent £65 .. | 40      |
| By Mr. LUCKHURST.                                                                              |         |
| Brixton—14, Sudbourne-road, 78 years, ground-rent £7. 7s. .....                                | 325     |
| By NEWBORN & HARDING.                                                                          |         |
| Barnsbury-road—No 161, term 23 years, ground-rent £50 .....                                    | 105     |
| Regent's Park—1, Cumberland-terrace, ground-rent of £42. 10s., term 37 years .....             | 710     |
| Clerkenwell—2 and 3, Arlington-street, 23 years, ground-rent £16 .....                         | 545     |
| Islington—45, Essex-road, 99 years, 13 years, ground-rent £18. 18s. .....                      | 630     |
| Holloway—40, 42, and 50, Grafton-street, 13 years, ground-rent £18. 18s. .....                 | 625     |
| Holloway-road—Nos. 854 and 656, freehold .....                                                 | 1,135   |
| Finchley—2, Grove-villa, freehold .....                                                        | 400     |
| By F. J. BISHOP.                                                                               |         |
| Rotherhithe—1 and 2, St. Paul's-lane, freehold .....                                           | 300     |
| 97, 99, and 101, Galleymall-road, 38 years, ground-rent £15 .....                              | 570     |
| Bernmondsey—116, Southwark Park-road, 40 years, ground-rent £5. 17s. .....                     | 410     |

## MEETINGS.

## MONDAY, OCTOBER 1.

Society of Engineers.—Mr. W. Lawford on "Light Railways," 7.30 p.m.  
Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. E. Moore, 8 p.m.

## TUESDAY, OCTOBER 2.

Glasgow Architectural Association.—(1) Mr. A. W. Beaton on "Wrought Iron-Work." (2) Mr. Larmont on "Church Organs."

## WEDNESDAY, OCTOBER 3.

Builders' Foremen and Clerks of Works' Institution.—8.30 p.m.

## THURSDAY, OCTOBER 4.

Glasgow Architectural Association. Visit to the Forth Bridge.

## FRIDAY, OCTOBER 5.

Architectural Association. Opening of the session, to be held at the Westminster Town Hall, 8 p.m.

**The present value of Building Sites in Brixton.**—The great increase in the value of building sites in Brixton has just been shown by the sale of a freehold piece of land having a frontage of 38 ft. and a depth of 123 ft. The land, which is on the south side of Brixton-road, opposite the Bon Marché establishment, was sold about thirty years since, to the then minister of Stockwell Independent Chapel, for his private residence, at the sum of 500*l*. Within the last few days it has again been sold, the sum realised for it being 3,650*l*. The purchaser is a well-known Brixton builder, who has also bought the adjoining property from the London, Chatham, and Dover Railway Company, with the view of erecting a public hall and some other buildings on the site.

## Miscellaneous.

**Opening of a New Town Hall, Elland, Yorkshire.**—Last week a new Town Hall was opened at Elland by Sir J. Savile. The front of the main building is broken with stone pillars, and there is a balcony over the doorway; while from the roof rises a bell-tower. The main entrance is reached by a flight of steps, which are flanked by stonework, and a staircase leading to the large hall is protected by a banister of pitch-pine, with mahogany rail. There is sitting accommodation in the area of the hall for 810 persons, and in the gallery for 240. The hall is lofty and well-lighted, and is ventilated by inlet shafts, which are inserted well up on the side walls, and outlet ventilators placed in the roof. The artificial lighting is by means of corona, with additional brackets for the sides of the room. On the same floor as the large hall a committee-room, and ante-rooms have been provided. The hall forms part of a block, comprising also eleven shops, and will cost 7,000*l*. The architect was Mr. C. F. L. Horsfall, of Halifax.

**The Thames Tunnel.**—A crowded meeting was held in the Town Hall, Poplar, on Monday evening, for the purpose of urging the Metropolitan Board of Works to proceed without delay with the construction of the Thames (Blackwall) Tunnel for vehicular traffic. Mr. Isaacson M.P., moved: "That this meeting desires to urge upon the Metropolitan Board of Works the importance of at once proceeding with the construction of the Thames (Blackwall) Tunnel for vehicular traffic." It had been objected that the construction of the approaches to the mouth of the tunnel would involve the demolition of a large number of artisans' dwellings, but there was plenty of room in the neighbourhood to accommodate any number of persons who might be displaced by the improvement. Major Webb seconded the motion, which was carried unanimously. It was further decided to appoint a deputation to wait upon the Metropolitan Board of Works, and, if considered necessary, upon the Home Secretary.

**Holywell Water Supply.**—An important meeting was held at the Holywell Assembly Hall, last week, when the claims were advanced of the new scheme for supplying with water the large and populous district embraced by Holywell, Greenfield, and Baglitt. A company has been formed with a capital of 20,000*l*, to carry out the scheme, and assistance has been promised by the Duke of Westminster and others. The source of the supply is Milsand, about a mile and a-half from Holywell, and the water, after passing through filtering beds, will be stored in two large reservoirs. The engineer of the scheme is Mr. H. E. Taylor, C.E., of Chester. The Mayor of Chester presided at the meeting, and Mr. C. E. Matthews, of Birmingham, strongly urged the inhabitants to support the scheme. A resolution approving the scheme was passed by the meeting.

**The English Iron Trade.**—With a continued activity in trade, the English iron market keeps very firm, with an upward tendency, of the whole. Pig-iron has been somewhat quieter without, however, any material giving way in price. Middlesbrough is about 3*d*. a ton lower, but elsewhere the movement is still the other way. The Glasgow warrant market has been agitated by constant fluctuations, and the end of the week finds warrants somewhat lower. Manufactured iron, for which there continues an active demand, is still rising, and although no actual advances have been made, they are spoken of as not being far off, while the prompt delivery an additional 2*s*. 6*d*. per ton of quoted prices has to be paid where such orders can be placed. Tin plates are in a rising mood. Steel is quite as active this week as last, with values firmly held at the high rates ruled. Shipbuilders continue to add to their orders, notwithstanding the higher prices asked for tonnage. The condition of the engineering trades remains very satisfactory.—*Iron*.

**Belfast.**—The Water Commissioners of Belfast have in consideration a scheme for wholesale filtration of the water supplied to the town of Belfast, with a provision for storage of the filtered supply.

**St. Paul's, Heston Moor.**—A double stained glass window was placed last week in St. Paul's Church, Heston Moor. The subject is Ruth gleaned in the fields of Boaz. The window has been supplied by Messrs. Edmondson & Son, of Manchester.



**Leith Drainage.**—We learn from the *Southend* that last week a special meeting of the 11th Town Council was held to consider a report from the special Parliamentary Committee, which recommended the approval of the drainage scheme adopted by the joint committee of the Corporations of Edinburgh and Leith, and asked for powers to promote a Bill in Parliament for giving effect to the same in co-operation with Edinburgh. The committee had powers to deal with the pollution of the water of Leith above Coltbridge, and should it be found necessary, stringent provisions would be inserted in the Bill to prohibit the discharge of refuse, filth, sewage, and other polluting matter into the Water of Leith above Coltbridge. They also recommended that the drainage districts into which the burgh of Leith was at present divided should be re-united and assessment levied over the whole burgh as soon as practicable. Mr. Archibald said it was inconceivable that after Edinburgh and Leith twenty-four years ago had spent about 60,000*l.*, and were now prepared to spend between 60,000*l.* and 70,000*l.* to carry away all their sewage and contamination, that Parliament should allow the water of Leith to continue to make the water of Leith a common sewer, to the danger of the health and lives of the citizens of the town. Should the parties above Coltbridge, who were interested and responsible for the pollution of the river, desire to come to terms with the Corporations, speaking for himself he would say that he believed they would be admitted on fair and even liberal terms, and would be better to spend some money in moving the sewage and other refuse at present allowed to flow into the Water of Leith above Coltbridge, than to spend it in the Courts of law. The motion that the report be adopted was carried, and the amendment that the Bill could deal with the pollution above Coltbridge was therefore shelved. If the position of matters is correctly stated, however, there is no doubt that this source of pollution must eventually be dealt with, and why not make one utter of it?

**New Pier for Southend.** The Southend Local Board, at their meeting last week, sealed contract with Messrs. Arrol Bros., of Glasgow, for the construction of a new pier, to take the place of the present unsightly one, which has become inadequate to the requirements of the pier, and which is considered to be not very safe. The total cost of the whole scheme is estimated to be about 60,000*l.*, but the amount of the present contract is a little over 43,000*l.* The contract is divided into three distinct sections, the first of which will consist of a double-decked pier of about 200 yards in length, extending from the present massive pier approach up to and including a concert-room, the second section consists of a commodious promenade and tramway pier about a mile in length, viz., from the concert-room to the head of the present pier. This portion of the structure will be 20 ft. wide, 12 ft. being reserved for promenading purposes, and the remainder for the tramway. The third section consists of a large pier-head, which will be erected just outside the present one. Three extensive landing-stages suitable to the different tides of the tide are to be provided at the pier-head, and there will also be refreshment and sitting rooms, and other conveniences situated at the pier. The engineers are Messrs. Brunel & McKerrow, of London, under whose supervision the work will be carried out.

**New Bridge over the Medway.**—On Wednesday last week a new bridge over the edway at Tunbridge was formally opened. The bridge spans the Medway at a point where it crosses the High-street, Tunbridge, on the main road from London to Hastings. It is of iron, and is 36 ft. 3 in. wide, hog-backed in shape. It is formed of two piers and buttresses, and is cost upwards of 3,000*l.* The architect was R. Luck, of Maidstone, and the contract for the builder's work was let to Messrs. Wallis & Clements, of Maidstone; and the iron-work was executed by Mr. Gray.

**New Catholic Schools at Seaham Harbour.**—On Monday last the new schools in connexion with the Roman Catholic Church of St. Mary Magdalene, at Seaham Harbour, were opened for teaching. The architect was Mr. C. Parsons, of Newcastle-on-Tyne, and the contractor was Mr. E. Weatherley, also of Newcastle. The cost has been about 1,200*l.*

**New Hospital for Newcastle.**—A new hospital for sick children, which has been erected at the Moor Edge, Newcastle, by the generosity of Mr. John Fleming, was formally opened on Thursday by Lord Armstrong. The building is in the "Domestic English" style of architecture of the 16th century, and is built of red Normanby brick, with smooth stone dressings from the Brunton and Wideopen Quarries. Access is gained to the entrance hall through the principal doorway, which consists of carved stone, and has a semi-circular head with fluted pilasters. The wall frame and pilasters of the hall are of oak, and the ceiling is panelled with ornamental moulding and arches. The floor is of specular marble. At the right of the entrance-hall an oak door leads to the Board Room, the dado of which is oak, and the walls above are covered with linocrust. The panelled ceiling is supported by square pillars with ornamental sides and capitals, and with oaken bases, and the flooring is of oak blocks. On the main corridor the matron's administrative department is situated, and from this corridor a door opens into the play-ground. The corridor to the left of the entrance-hall contains the medical officer's department, and the ceiling is panelled and supported by pilasters, while the floor is of marble. At the entrance end of the north wing are the medical officer's bed-room and sitting-room, and on the ground-floor the dining-hall, which is 38 ft. long, 20 ft. wide, and 18 ft. high. The floor of this hall is of oak blocks, ornamental pilasters support the cornice, with clearstory windows over, and a panelled ceiling. Adams' patent ventilators are used, and the heating is by steam coils. There is accommodation in the hall for 130 children. Separate from the main building the wash-house, laundry, &c., have been provided, and adjacent to the laundry is a boiler-house. From the entrance-hall, a marble stairway leads to the upper portion of the building. The balusters are in cast-iron panels, with newel posts and ornamental lamps. The stairs are lighted by a large wrought-iron circular dome light, with a ventilator in the centre. On the first floor is the day room, which is ventilated by two inlet ventilators and one outlet. To the right and left of the day-room are the wards, the arrangement in each wing being similar. Next to the day-room is a small ward, and on the other side of the corridor is the ward scullery. Nurses' rooms, in electrical communication with the departments of the matron and the medical officer, are arranged on this floor, and also the general ward, which is 60 ft. long and 20 ft. wide. There are five double windows on each side. The floor is of pitch pine, and from two sides door-windows open on to small balconies. A little higher up the stairs is the surgical ward, and the top floor is devoted to the use of the nurses resident in the institution. The total number of children's cots in the hospital is sixty-three. The total cost of the new hospital has been 23,000*l.* The architects were Messrs. J. S. Quilter & G. Wheelhouse, and the contractors were Messrs. J. & W. Lowry, all of Newcastle.

**The Surveyors' Institution.**—A large and representative gathering of the Fellows of The Surveyors' Institution resident in the counties of Lancashire and Cheshire was held in the meeting-room of the Manchester Society of Accountants last week. The object of the meeting was the formation of a Provincial Committee of the Institution for the two counties above referred to, on the basis of the scheme for the local organisation of members throughout the provinces which is in course of gradual development by the Council. The Secretary of the Institution, who was present at the invitation of the Provisional Chairman, explained in detail the constitution of the new committees and the objects the Council have in view in their formation. Mr. John Cross, of 77, King-street, Manchester, to whose hands the preliminary arrangements were confided by the Council, was unanimously elected Chairman of the Committee for the ensuing year. In the exercise of the discretion vested in the meeting by the rules of procedure, it was resolved that the Committee be designated the Provisional Committee of the Surveyors' Institution for the Counties Palatine of Lancashire and Cheshire. After the completion of the formal business of the meeting the Committee proceeded to consider the arrangements for the preliminary examination for the admission of students to the Institution, to be held at Manchester, under the auspices of the committee, on January 22 and 23 next, Messrs J. Holden, T. Silk Wilson, E. J. Bridgeford, and T. A. Dickson being appointed moderators for the purpose.

**Reredos, St. Mary's, Lambeth.**—This reredos, presented to the church by Sir Henry Doulton, was announced to be "dedicated" on Friday of this week. It has been executed at the works of Messrs. Doulton, Lambeth, from the designs of Mr. J. Oldrid Scott. With the exception of four columns which are in Salt Glazed Doulton-ware, the whole of the reredos is in a fine terra cotta of warm buff tint. It consists of a central portion 8 ft. 6 in. wide, containing three arched bays; the centre opening is filled with a representation of the Crucifixion, and the arches on either side are subdivided, and each contains two sculptured figures. Slightly recessed from the central portion there are wings 3 ft. wide on either hand, making the total width of the reredos about 14 ft. 6 in. Up to a height of 5 ft. the design is quite plain: the portion next above contains the sculptured panels set within arches with tracery heads. The central portion is terminated with a projecting cornice with ribbed cove below, and open cresting and pinnacles above; the highest pinnacles will support statuettes of angels. The height to the top of the cresting is 11 ft. 9 in., and to the top of the statuettes about 15 ft. The weight of the whole reredos is carried clear of the floor by means of a concealed girder. The sculptures have been designed and modelled by Mr. George Tinworth. The central panel (4 ft. 9 in. high, 2 ft. 9 in. wide) contains a representation of the Crucifixion. In the four smaller panels are single figures of the Patriarch Moses, the Apostles Peter and Paul, and the Prophet Elijah. Inserted in quatrefoil panels in the wings of the reredos are four portrait medallions of archbishops:—Hubert Walter or Fitzwalter, Archbishop from 1193 to 1207, Lord High Chancellor in the reign of Richard I.; Richard Bancroft, Archbishop from 1604 to 1610; Thomas Tenison, 1695 to 1716; and Thomas Secker, Archbishop from 1758 to 1768, buried in the churchyard of Lambeth. Secker bequeathed the whole of his library to the palace. The medallions of Bancroft, Tenison, and Secker have been modelled from photographs taken from the original portraits in Lambeth Palace; that of Tenison was painted by Simon Dubois, and that of Secker by Sir Joshua Reynolds.

**The Oakfield Estate at Ashted.**—Sale of Building Sites.—A large area of land, forming a portion of the Oakfield Estate at Ashted, in Surrey, and covering upwards of fifty acres in extent, has just been laid out for building upon. Between 250 and 300 houses and shops are intended to be erected on the estate, all of them being of a high class, no house of a less prime cost value than 2400*l.* to be erected on any of the plots, whilst as regards several of the plots, the minimum value is £600. A number of new roads, 50 ft. wide, have been formed on the estate, three of them being nearly half a mile in length each. The first portion of the estate, containing seventy-four plots, was offered for sale last week, by Messrs. Baker & Sons, the sale taking place in a marquee on the estate, when a numerous company was present. Most of the plots submitted have frontages of 25 ft. and depths of from 180 ft. to 200 ft., whilst some of them are much larger, having frontages of 60 ft. each. On these last-named plots detached villas only are to be erected, having forecourts of 30 ft. in depth from the main roads. The auctioneer, in offering the property, drew attention to its attractive character, pointing out that Ashted was becoming an increasingly residential suburb, being reached in forty minutes from London, and that the estate bordered upon the Ashted and Leatherhead Commons, upwards of 1,000 acres in extent, known as being amongst the most picturesque in England. Amongst those present were several speculators and builders, and the biddings for the different plots was very active. Most of the sites submitted were sold, the prices realised varying from 30*l.* and 40*l.* up to about 100*l.* for the larger plots. The proceeds of the sale amounted to upwards of 1,980*l.*

**New Clock for Mysore.**—The Maharajah of Mysore has ordered a large clock, with two illuminated dials, to chime the Cambridge quarters, on bells of about one ton. The bell-framing to be supplied is of teak, the clock of the best gun-metal, with compensated pendulum of zinc and iron tubes. The maker is Mr. J. W. Benson, of London.

**Roman Catholic College, Tooting.**—We are asked to mention that the locks and door-fittings for this building, described in our columns last week, were supplied by Mr. James Hill.



**New Hospitals for Liverpool.**—On Saturday last, two new hospitals for infectious diseases, erected by the Corporation of Liverpool in Netherfield-road and Grafton-street, were formally opened by the Mayor of Liverpool. The Netherfield-road institution has been constructed out of a formerly existing building which was used as a private charity hospital and which consisted of a small administrative block and two pavilions. In the new hospital nothing but the outside walls of the old building has been left, and in reconstructing the pavilions four new wards have been provided in each, in addition to four private wards in one and two in the other, and altogether the building is capable of accommodating between eighty and ninety patients. Access to the upper wards is obtained by the outside staircase, thus effecting a complete separation from the wards beneath, and affording a means of treating male and female patients for four distinct diseases. Complete accommodation has also been provided for the matron, medical officer, nurses, and servants. The sanitary arrangements and means of ventilation have had careful attention, and steam laundry and disinfecting-rooms have been erected at the rear of the main building. The architect was Mr. H. Sheldermine, of Liverpool; and the contractors were Messrs. Morrison & Sons, also of Liverpool. The Grafton-street hospital is planned on the pavilion system, and has accommodation for seventy patients in eleven distinct wards. Each block is thoroughly disconnected, and the system of cross-ventilation has been adopted, while the greatest possible isolation of each ward and department of the building, consistent with economical and efficient administration, has been arranged. Three special wards are reserved for receiving and isolating doubtful cases. Two complete and distinct steam laundries, one for the patients' and the other for officials' clothing, &c., form part of the scheme; and a powerful high-pressure steam apparatus is provided for rapidly disinfecting bedding and tainted clothing. The administrative buildings are complete in every detail; the drainage and other sanitary details have been carried out with care. The architects were Messrs. Simpson & Allen, London, and the contractors Messrs. Holme & Green, Liverpool. The two new buildings are capable of accommodating about 160 patients, and the total cost, exclusive of the Grafton-street site, is about 27,000*l*.

**Street Paving.**—We take the following statement of experience as to various pavings from the annual report of Mr. Lovegrove, the Surveyor to the Board of Works of the Hackney District:—"The extra cost of maintaining wood-paving, as compared with granite, is to a considerable extent met by the reduced first cost, while wood has the great compensating advantage of being so much less noisy than either granite paving or macadam. Granite 4 in. by 4 in. cubes would be far cheaper than macadam, and the following dates of laying show the endurance of this material:—

Mars-street, north of St. Thomas's-square, laid in 1873.

Clapton-road, laid in 1873, relaid last year.

Upper Clapton, laid in 1873, relaid last year.

Granite paved roads have, however, the drawbacks of being noisy and slippery. As to relative costs, the following figures may serve as an index:—

|                                                                             | Per yd. | supl. |
|-----------------------------------------------------------------------------|---------|-------|
| 6 x 4 in. Guernsey granite pitchings laid on 6 in. Portland cement concrete | 15      | 0     |
| 4 x 4 in. ditto ditto                                                       | 11      | 0     |
| Wood paving as already laid in the district                                 | 7       | 9     |
| Broken granite—average thickness, 3 in., including labour and relaying      | 1       | 6     |

The macadam requires renewal in from one to six years according to the traffic, and the extra cost of clearing the mud and dust is considerable. The broken granite margins alongside the tramways are very costly to maintain. The repairs now carried on with the 2½ in. broken irregular stones under the steam roller, quickly work away from the tramway paving, and the constant feeding involves an outlay which, in a few years, far exceeds the cost of proper paving. In the course of ten years the cost per yard super of such repairs cannot be less than ten shillings, and is frequently much more."

**Memorial Window, Lyme Regis.**—A new painted north-east window has just been placed in the parish church of Lyme Regis, in memory of the late vicar, the Rev. G. H. P. Barlow. The work has been executed by Messrs. Bell & Beckham, of London.

**The late Anglo-Danish Exhibition.**—A two days' sale last week of the fittings and appointments of the recent Anglo-Danish Exhibition brought a numerous company to South Kensington. The catalogue contained 440 lots, and included the whole of the furniture, draperies, and decorations which had been utilised for the exhibition; but the most interesting portions of the property submitted were the erection of the theatre to seat 1,000 persons; the Danish village, in eleven lots, containing Danish houses, cottages, and a village inn; also the Danish grotto; the switchback railway and Alpine scenery; the Doulton panels; several iron buildings, rustic bridges and summer-houses, which had been erected in different portions of the grounds for the purposes of the exhibition; together with a representation in stone of "Hamlet's Grave." Several terra-cotta vases were likewise included in the sale. Amongst the prices realised was 540*l*. for the theatre, built by Mr. Humphreys, of the Albert Gate Works, constructed of timber frame-work, and covered with corrugated iron. The dimensions of the building are 45 ft. long by 45 ft. wide, with stumion, additions, consisting of fourteen side boxes, dressing-rooms, and offices. It was stated to be well adapted for a volunteer drill-hall, lecture-hall, or public institution. The scenery and tableaux connected with the theatre were sold for 26*l*. The terra-cotta vases, eighteen in number, realised an aggregate sum of upwards of 50*l*. After a few bids had been made for the cottages forming the Danish village, the auctioneer announced that the whole of them were withdrawn. The Danish grotto was described as 96 ft. long and 18 ft. wide, the exterior painted and moulded to represent rockwork, and the interior arranged for an exhibition of paintings. The auctioneer in submitting this portion of the property, said it had cost upwards of 250*l*., and that he had a reserve of 50*l*. upon it. As the biddings were only nominal, it was withdrawn. The switchback railway was described as 440 ft. long, 22 ft. wide at the stumion, and 14 ft. wide at the extremity, with double tracks. Four cars, by the Ashbury Carriage Works Company, were included in the sale. The auctioneer announced that the railway was erected this year for the purposes of the exhibition, at a cost of more than 400*l*., but the highest sum offered was 115*l*., at which it was sold. The painted Arctic scenery forming the background of the railway, with the framing and supports, was sold for 20*l*. The sale concluded by the offer of the Doulton panels at the main entrance-hall. They were described as faced with slabs of terra-cotta, painted in the impasto process recently introduced by Doulton & Co. Two large panels on either side, each 16 ft. high by 7 ft. 6 in. wide, were said to be probably the largest paintings ever yet executed in ceramic ware. The highest offer was 85*l*., at which they were withdrawn. There was no offer for "Hamlet's Grave." The total proceeds amounted to upwards of 2,800*l*. Messrs. Baker & Sons conducted the sale.

**Dangers of "Rising" Health Resorts.**—People little reck of the dangers which they run in exchanging their own comfortable, well-ordered house for stuffy seaside lodgings, where imperative economy requires that no more rooms shall be hired than are necessary. The sink and water-closet arrangements at all "rising" health resorts will be found almost uniformly bad. In the old days, when only a few stray visitors came, the sewage went into cess-pools, and the water supply was obtained from wells. Now, all the houses boast their water-closets, connected in more or less unsanitary fashion with drains laid down in the streets, and converging to a sewer discharging into the sea. The drains are usually put down piecemeal, and the levels are not right. The water supply is intermittent, and as a consequence, closet-pans get dry, and sewer-gas pours up into the houses. Add to this the fact that the place has no building bye-laws, and that any one may and does erect new houses in his own fashion, and at any angle that he chooses to existing roads, and the dangers in the case of infectious disease getting a foothold in the place will at once be manifest.

**Sanitary Record.**  
**Sewage Scheme for Preston.**—The Town Council of Preston intend, at their next meeting, to propose that the Council memorialise the Local Government Board for power to borrow a sum of 130,000*l*. for the purpose of carrying out a sewage scheme by which the sewage of the town will be taken down to a farm at Freckleton, about three miles away.

**New Free Harbour and Depots at Copenhagen.**—The Danish Ministry of Finance, inviting designs for the new free harbour and depots to be established in Copenhagen. The ground has been chosen for it. Either the depots are to be arranged in one large building or a number of small ones, but none of the latter must be above three storeys, including vaults. The whole is to embrace 15,000 square metres for storage, and, besides, offer accommodation for offices. Of the designs received for the harbour, the six best will be paid for, with 166*l*., and the rest with 110*l*., whilst five of the best for the free depots will be remunerated at the rate of 55*l*. each. All the designs should be in the hands of the Danish Ministry of Finance by Nov. 1.

## PRICES CURRENT OF MATERIALS.

|                                               |    | £. | s. | d. | £. | s. | d. |
|-----------------------------------------------|----|----|----|----|----|----|----|
| TIMBER.                                       |    |    |    |    |    |    |    |
| Teak, E.I., load                              | 8  | 0  | 0  | 12 | 10 | 0  | 0  |
| Sequoia, U.S., foot cube                      | 0  | 2  | 3  | 0  | 3  | 0  | 3  |
| Birch, Canada, load                           | 2  | 15 | 0  | 4  | 15 | 0  | 0  |
| Fir, Dantzig, &c., load                       | 2  | 0  | 0  | 4  | 7  | 0  | 0  |
| Oak, Canada, load                             | 2  | 0  | 0  | 4  | 10 | 0  | 0  |
| Pine, Canada red, load                        | 2  | 10 | 0  | 3  | 10 | 0  | 0  |
| Lath, Dantzig, lathom                         | 3  | 10 | 0  | 5  | 0  | 0  | 0  |
| St. Petersburg, 1st yellow                    | 2  | 10 | 0  | 6  | 0  | 0  | 0  |
| Vancouver, Odesa, 1st yellow                  | 2  | 10 | 0  | 10 | 0  | 0  | 0  |
| Desis, Fir, 2nd and 1st, std. 100             | 7  | 0  | 0  | 9  | 0  | 0  | 0  |
| Riga, 2nd                                     | 7  | 0  | 0  | 8  | 0  | 0  | 0  |
| St. Petersburg, 1st yellow                    | 7  | 10 | 0  | 15 | 10 | 0  | 0  |
| 2nd                                           | 9  | 0  | 0  | 10 | 0  | 0  | 0  |
| white                                         | 7  | 10 | 0  | 10 | 0  | 0  | 0  |
| Swedish                                       | 7  | 10 | 0  | 16 | 10 | 0  | 0  |
| White Sea                                     | 8  | 10 | 0  | 17 | 10 | 0  | 0  |
| Canada, Pine, 1st                             | 16 | 0  | 0  | 25 | 10 | 0  | 0  |
| 2nd                                           | 10 | 10 | 0  | 17 | 10 | 0  | 0  |
| 3rd, &c.                                      | 7  | 10 | 0  | 10 | 10 | 0  | 0  |
| Spruce, 1st                                   | 3  | 10 | 0  | 19 | 0  | 0  | 0  |
| 3rd and 2nd                                   | 7  | 0  | 0  | 8  | 10 | 0  | 0  |
| New Brunswick, &c., load                      | 6  | 10 | 0  | 8  | 0  | 0  | 0  |
| Battens, all kinds                            | 5  | 10 | 0  | 12 | 0  | 0  | 0  |
| Flooring, Boards, 60 x 1 1/2, prepared, First | 0  | 11 | 0  | 0  | 14 | 0  | 0  |
| Second                                        | 0  | 8  | 0  | 0  | 10 | 0  | 0  |
| Other qualities                               | 0  | 5  | 6  | 0  | 0  | 0  | 0  |
| Cedar, Cuba, foot                             | 0  | 3  | 4  | 0  | 0  | 0  | 0  |
| Honduras, &c., foot                           | 0  | 0  | 34 | 0  | 0  | 0  | 0  |
| Australian                                    | 0  | 0  | 2  | 0  | 0  | 0  | 0  |
| Madagascar, Cuba                              | 0  | 0  | 11 | 0  | 0  | 0  | 0  |
| St. Domingo, cargo average                    | 0  | 0  | 11 | 0  | 0  | 0  | 0  |
| Mexican                                       | 0  | 0  | 4  | 0  | 0  | 0  | 0  |
| Tobacco                                       | 0  | 0  | 14 | 0  | 0  | 0  | 0  |
| Honduras                                      | 0  | 0  | 4  | 0  | 0  | 0  | 0  |
| Box, Turkey                                   | 6  | 0  | 0  | 12 | 0  | 0  | 0  |
| Walnut, Italian                               | 0  | 0  | 44 | 0  | 0  | 0  | 0  |

|                                |   | £. | s. | d. | £. | s. | d. |
|--------------------------------|---|----|----|----|----|----|----|
| METALS.                        |   |    |    |    |    |    |    |
| IRON—Bar, Welsh, in London ton | 4 | 17 | 8  | 5  | 0  | 0  | 0  |
| " at works in Wales            | 1 | 7  | 8  | 4  | 10 | 0  | 0  |
| St. Staffordshire, in London   | 5 | 5  | 0  | 6  | 15 | 0  | 0  |

|                              |     | £. | s. | d.  | £. | s. | d. |
|------------------------------|-----|----|----|-----|----|----|----|
| COPPER.                      |     |    |    |     |    |    |    |
| British, cake and ingot, ton | 78  | 10 | 0  | 80  | 0  | 0  | 0  |
| Best selected                | 79  | 10 | 0  | 81  | 0  | 0  | 0  |
| Sheets, strong               | 85  | 0  | 0  | 0   | 0  | 0  | 0  |
| Chili, bars                  | 101 | 0  | 0  | 101 | 0  | 0  | 0  |

|                        |    | £. | s. | d. | £. | s. | d. |
|------------------------|----|----|----|----|----|----|----|
| LEAD.                  |    |    |    |    |    |    |    |
| Pig, Spanish           | 11 | 5  | 0  | 14 | 7  | 0  | 0  |
| English, common brands | 11 | 7  | 6  | 14 | 10 | 0  | 0  |
| Sheet, English         | 11 | 10 | 0  | 15 | 12 | 0  | 0  |

|                 |    | £. | s. | d. | £. | s. | d. |
|-----------------|----|----|----|----|----|----|----|
| SHEET-IRON.     |    |    |    |    |    |    |    |
| Sweden, special | 10 | 0  | 0  | 19 | 2  | 0  | 0  |
| Ordinary brands | 18 | 17 | 6  | 19 | 0  | 0  | 0  |

|                |     | £. | s. | d. | £. | s. | d. |
|----------------|-----|----|----|----|----|----|----|
| TIN.           |     |    |    |    |    |    |    |
| Burma          | 103 | 0  | 0  | 0  | 0  | 0  | 0  |
| Malacca        | 103 | 0  | 0  | 0  | 0  | 0  | 0  |
| Straits        | 104 | 0  | 0  | 0  | 0  | 0  | 0  |
| Australian     | 104 | 0  | 0  | 0  | 0  | 0  | 0  |
| English Ingots | 107 | 10 | 0  | 0  | 0  | 0  | 0  |
| Zinc           | 22  | 0  | 0  | 23 | 0  | 0  | 0  |

|                        |    | £. | s. | d. | £. | s. | d. |
|------------------------|----|----|----|----|----|----|----|
| OILS.                  |    |    |    |    |    |    |    |
| Linseed                | 19 | 7  | 6  | 19 | 10 | 0  | 0  |
| Cocunut, Ceylon        | 26 | 0  | 0  | 28 | 0  | 0  | 0  |
| Ceylon                 | 25 | 0  | 0  | 0  | 0  | 0  | 0  |
| Palm, Lagos            | 23 | 0  | 0  | 0  | 0  | 0  | 0  |
| Rapeseed, English pale | 28 | 10 | 0  | 0  | 0  | 0  | 0  |
| " brown                | 27 | 0  | 0  | 27 | 5  | 0  | 0  |
| Cottonseed, refined    | 21 | 15 | 0  | 22 | 0  | 0  | 0  |
| Tallow and Oleine      | 23 | 0  | 0  | 43 | 0  | 0  | 0  |
| Lard, strong U.S.      | 4  | 0  | 0  | 6  | 0  | 0  | 0  |
| " refined              | 7  | 0  | 0  | 12 | 0  | 0  | 0  |

|                    |   | £. | s. | d. | £. | s. | d. |
|--------------------|---|----|----|----|----|----|----|
| TURPENTINE.        |   |    |    |    |    |    |    |
| American, in casks | 1 | 11 | 0  | 0  | 0  | 0  | 0  |
| Stockholm          | 0 | 16 | 0  | 0  | 16 | 0  | 0  |
| Archangel          | 0 | 10 | 0  | 0  | 10 | 0  | 0  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BAYSWATER.**—For alterations and shop fittings at 80 Queen's-road, W., for Mr. B. P. Joyce, Mr. Will A. Burr, architect, 85, Chancery-lane, W.C.  
 Bray & Pops ..... 2339 0 0  
 Young & Co. .... 299 0 0  
 Lacks & Son ..... 286 0 0  
 Stevens Bros (accepted) ..... 227 10 0

**CHILSEA.**—For steam heating apparatus, for heat the wards of the Chelsea Infirmary, Colver-street, Chis for the Guardians, Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. No quantities—  
 Clements, Joakes, & Co. .... £1,055 0 0  
 H. Crane ..... 885 0 0  
 Bradford & Co. .... 961 0 0  
 J. & F. May ..... 891 10 0  
 Benham & Son ..... 882 0 0  
 Summerscales & Son ..... 877 0 0  
 Potter & Sons, South Molten-st., W.\* 862 0 0  
 \* Accepted.



## CONTRACTS AND PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.          | By whom required.                 | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------|-----------------------------------|-----------------------------------|--------------------------|-------|
| For Macadamising                       | Hull Corporation                  | A. E. White                       | Oct. 4th                 | ii.   |
| Wall and Esplanade                     | Sandown Local Board               | J. Newman                         | do.                      | ii.   |
| with Outbuildings, Seaton Sluice       | Admiralty                         | Official.                         | Oct. 5th                 | ii.   |
| in Guernsey Granite                    | Willesden Local Board             | O. Claude Robson                  | Oct. 9th                 | ix.   |
| and Gases, Drain Pipes and Stores      | Croydon Corporation               | Official.                         | do.                      | ix.   |
| and other Buildings                    | St. Mary's (Battersea)            | J. T. Pilditch                    | do.                      | ix.   |
| ing-up and Paving Road                 | Vestry                            | Official.                         | do.                      | ix.   |
| Whitkin &                              | Wandsworth Bd. of Wk.             | T. Bennett                        | do.                      | ix.   |
| ies and Pumps                          | do.                               | do.                               | do.                      | ix.   |
| Iron Water Mains                       | do.                               | do.                               | do.                      | ix.   |
| and Houses, Southend                   | W. Lloyd Wise, Esq.               | E. Wright                         | do.                      | ix.   |
| ing-up Road                            | S. Hornsey Local Board            | E. Fry                            | Oct. 10th                | ix.   |
| age Works                              | Essex Local Board                 | T. G. Edwards                     | do.                      | ix.   |
| g, &c., Works                          | Hammersmith Vestry                | H. Muir                           | do.                      | ix.   |
| ation, &c., to Town-hall               | Horseham Local Board              | J. Percy Gates                    | Oct. 11th                | ix.   |
| es' Store, Tool House, &c.             | Fulham Union                      | Official.                         | do.                      | ix.   |
| ing-up Roads                           | Walthamstow Local Bd.             | do.                               | Oct. 12th                | ix.   |
| Brigade Station, Marylebone            | Met. Board of Works.              | do.                               | Oct. 15th                | ix.   |
| Shops, &c.                             | Bethnalgreen Co-operative Society | J. F. Goodey                      | Oct. 17th                | ii.   |
| ing, &c., Repairs to Houses, Hampstead | Salvation Army                    | E. J. Sherwood                    | Not stated               | ix.   |
| Barracks, Great Grimsly                | do.                               | do.                               | do.                      | ii.   |

## PUBLIC APPOINTMENT.

| Nature of Appointment. | By whom Advertised. | Salary.          | Applications to be in. | Page. |
|------------------------|---------------------|------------------|------------------------|-------|
| of Works               | Bath U.S.A.         | 2l. 2s. per week | Oct. 8th               | ii.   |

BOYDON.—For class-room and additional cloak-rooms, &c., to the junior department of the Beulah-road School, for the Croydon School Board. Mr. Robert Eddge, surveyor to the Board, architect. Quantities by the architect.—

Monkton ..... £707 0 0  
 Bantley ..... 680 0 0  
 Coleby & Co. .... 675 0 0  
 Jones ..... 550 0 0  
 Hayley & Co. .... 540 0 0  
 Pearson & Co. .... 538 15 1  
 Bailey & Linfoot ..... 538 0 0  
 Pearson & Co. .... 538 0 0  
 Docking ..... 511 0 0  
 J. & C. Bowyer ..... 519 0 0  
 Mid-Kent Building and Contracting Works ..... 490 10 0  
 Ockenden ..... 197 0 0  
 Pearce ..... 480 0 0  
 Smith & Co. .... 465 0 0  
 Hole ..... 459 0 0  
 Verrall ..... 455 0 0  
 Knight & Bennett ..... 447 0 0  
 Caples & Redgrave ..... 447 0 0  
 Winburn (accepted) ..... 435 0 0

BOYDON.—For additional cloak-rooms and lavatories for girls' and infants' departments of the South Nor. Schools, for the Croydon School Board. Mr. Robert Eddge, surveyor to the Board, architect. Quantities by the architect.—

Monkton ..... £430 0 0  
 Bantley ..... 391 0 0  
 Bryan ..... 369 0 0  
 Docking ..... 358 0 0  
 Jones ..... 354 0 0  
 Hayley & Co. .... 349 0 0  
 Pearson & Co. .... 328 18 8  
 Bailey & Linfoot ..... 321 0 0  
 Ockenden ..... 311 0 0  
 J. & C. Bowyer ..... 295 0 0  
 Verrall ..... 286 0 0  
 Winburn ..... 286 0 0  
 Smith & Sons ..... 287 0 0  
 Caples & Redgrave ..... 286 0 0  
 Pearce ..... 273 0 0  
 Mid-Kent Building and Contracting Works ..... 277 10 0  
 Hole (accepted) ..... 240 0 0

ERTFORD.—For the construction of new flood-gates, overflow weir on the River Bease, for the Corporation. Mr. Russell Austin, engineer, Hertford.—

William Gray, Hertford ..... £234 12 0  
 George Bell, Tottenham ..... 505 11 0  
 John Cook, Spalding (accepted) ..... 481 0 0

ERTFORD.—For the construction of about 700 yards, outfall sewer, together with manholes, tanks, and the operation of land for sewage disposal at Little Amwell, for the Hertford Rural Sanitary Authority. Mr. Russell Austin, engineer, Hertford.—

John Cook, Spalding ..... £741 0 0  
 George Bell, Tottenham ..... 583 0 0  
 Thomas Adams, 32, Canal-road, Kingsland (accepted) ..... 583 0 0

ETONSTONE.—For Wesleyan Methodist School and Chapel Extension. Mr. G. Baines, architect, 4, Great Manchester-street, E.C.—

| A.                 | B.       | C.         | D.         | E.       |
|--------------------|----------|------------|------------|----------|
| P. & H. P. Higgs   | £740 0 0 | £2,998 0 0 | £2,439 0 0 | £830 0 0 |
| H. H. Holliday     | 760 0 0  | 2,974 0 0  | 383 0 0    | 670 0 0  |
| J. Carley          | 727 0 0  | 2,899 0 0  | 399 0 0    | 670 0 0  |
| R. G. Battley      | 676 0 0  | 2,722 0 0  | 546 0 0    | 575 0 0  |
| S. J. Sout         | 559 0 0  | 2,721 0 0  | 399 0 0    | 593 0 0  |
| J. H. & S. H. & S. | 700 0 0  | 2,779 0 0  | 420 0 0    | 597 0 0  |
| Geo. J. Hosking    | 690 0 0  | 2,759 0 0  | 410 0 0    | 597 0 0  |
| North Bros.        | 508 0 0  | 2,538 0 0  | 390 0 0    | 595 0 0  |
| James Minter       | 671 0 0  | 2,505 0 0  | 399 0 0    | 595 0 0  |
| Geo. Dobson        | 880 0 0  | 2,496 0 0  | 399 0 0    | 595 0 0  |
| F. J. Coxhead      | 563 18 6 | 2,389 7 0  | 346 15 3   | 538 15 3 |

A.—Extension of Chapel.  
 D.—Library, Church Parlour, Vestry, &c.

\* Accepted.

C.—Bachelors' Room and Kitchen, &c.  
 E.—Boundary-wall, Fence, and Gates.

LONDON.—For alterations and repairs to No. 32, Wardour-street, Soho. Mr. R. H. Kerr, architect, 139, Oxford-street, W.—

J. & J. Greenwood ..... £541 0 0  
 Gould & Brand ..... 473 0 0  
 Manley & Son ..... 380 0 0  
 J. & J. Frost ..... 373 0 0  
 Pusey & Lumley (accepted) ..... 350 0 0  
 [Buckle (late) not stated.]

LONDON.—For alterations and additions to the "Horse and Groom" public-house, Newington-butts, S.E., for Mr. G. J. Flood. Messrs. Lewcock & Orison, architects and surveyors, 83, Bishopgate-street Within, E.C.—

Ivory ..... £1,068 0 0  
 Holloway ..... 990 0 0  
 Spencer & Co. .... 955 0 0  
 Hanly ..... 960 0 0  
 Balaam Bros. .... 969 0 0  
 Mover & Son ..... 940 0 0  
 Stevenson ..... 889 0 0

LONDON.—For new shop-front and repairs, &c., to No. 7, Oxford-street. Mr. R. H. Kerr, architect, 139, Oxford-street, W.—

Marler & Bonnett ..... £239 0 0  
 J. & J. Greenwood ..... 354 0 0  
 Drew & Cadman ..... 329 0 0  
 J. O. Richardson ..... 287 0 0  
 Tilly & Jones (accepted) ..... 283 10 0

LONDON.—For new building, North-row, Oxford-street. Mr. E. Burnell, of Bedford-row, and Mr. H. S. Legg, of Christ's Hospital, architects.—

Asby & Horner ..... £10,240 0 0  
 Holland & Hansen ..... 9,836 0 0  
 Patman & Fotheringham ..... 9,727 0 0  
 Patrick & Son ..... 9,727 0 0  
 Hall, Beddall, & Co. .... 9,384 0 0  
 Perry & Co. .... 9,147 0 0  
 Wall Bros. .... 8,930 0 0  
 Clarke & Bracey ..... 8,444 0 0  
 Chappell ..... 8,079 0 0

LONDON.—For the erection of new factory at the Grange, Bermondsey, for Mr. J. Gurnar. Messrs. G. Elkington & Son, architects.—

Wells ..... £1,339 0 0  
 Holloway ..... 1,337 0 0  
 J. & J. Greenwood ..... 1,343 0 0  
 W. Downs ..... 1,320 0 0  
 A. White & Co. .... 1,273 0 0  
 W. & F. Crocker (accepted) ..... 1,215 0 0

LONDON.—For rebuilding the "Duke of York" public-house, Queen-street, Edgware-road. Mr. J. W. Brooker, architect.—

Garrett ..... £2,810 0 0  
 Battley ..... 2,465 0 0  
 W. Downs ..... 2,468 0 0  
 W. & F. Crocker ..... 2,414 0 0  
 J. Beale ..... 2,100 0 0

MONMOUTH.—For additions to Hospital. Mr. F. A. Powell, architect, 200, Kennington Park-road, S.E.—

Simmons ..... £285 0 0  
 C. Morgan ..... 160 0 0  
 D. Roberts (accepted) ..... 144 0 0

NORTHGATE, GREAT YARMOUTH.—For alterations and additions to Board School. Messrs. Bottle & Olley, architects.—

J. P. Knights, Yarmouth ..... £3,145 0 0  
 R. Davy, Yarmouth ..... 2,878 0 0  
 R. Kemp, Gorleston ..... 2,842 0 0  
 G. H. Springall, Yarmouth ..... 2,790 0 0  
 Cork & Beech, Yarmouth ..... 2,688 0 0  
 J. Leggett, Yarmouth ..... 2,636 0 0  
 T. Howes, Yarmouth ..... 2,584 0 0  
 Rand & Cooper, Yarmouth ..... 2,569 0 0  
 Grimble & Watts, Yarmouth ..... 2,520 0 0  
 J. S. Cooper, Yarmouth ..... 2,475 0 0  
 E. Eastoe, Yarmouth ..... 2,444 0 0  
 T. G. Leggett, Gorleston ..... 2,443 0 0  
 J. H. Hawes, Yarmouth (accepted) ..... 2,440 0 0  
 J. F. Bray, Yarmouth ..... 2,184 0 0

NOTTING-HILL.—For St. Columba's Mission Church, Notting-hill, for the Rev. Canon Trench. Mr. E. F. Loftus Brock, architect.—

Sabey & Son ..... £1,690 0 0  
 Avis & Co. .... 1,670 0 0  
 Batchelor ..... 1,620 0 0  
 Mattock Bros. .... 1,597 0 0  
 Dove Bros. .... 1,575 0 0  
 Phillips & Son ..... 1,570 0 0  
 Oldrey & Co. .... 1,527 0 0  
 Peters ..... 1,520 0 0  
 Nyallor ..... 1,493 0 0  
 Allen & Sons ..... 1,365 0 0  
 Kynoch & Co. .... 1,395 0 0

PUTNEY.—For pulling down and rebuilding the "Railway Hotel," Putney, for Mr. H. Dobbin. Mr. F. J. Egan, architect. Quantities by Mr. Charles Barnard.—

T. Grant, Putney ..... £10,408 0 0  
 Earle & Son ..... 9,638 0 0  
 Gregory & Co. .... 8,775 0 0  
 Smith ..... 8,751 0 0  
 J. H. Cox ..... 8,347 0 0  
 Jackson & Todd ..... 8,159 0 0  
 Spencer ..... 8,140 0 0  
 Patman & Fotheringham ..... 7,924 0 0  
 W. R. Williams, Putney ..... 7,900 0 0  
 Balaam Bros. .... 7,820 0 0  
 E. Avis & Co., Putney ..... 7,798 0 0

ROTHERHITHE.—For new stabling and dwellings, &c., St. Helena-gardens, Rotherhithe, for Mr. E. W. Robinson. Mr. J. W. Stevens, architect and surveyor, 21, New Bridge-street, E.C.—

W. A. Rhodes, Kensington ..... £1,580 0 0  
 W. & H. Castle, Southwark ..... 1,370 0 0  
 J. T. Peppitt, Hoxton ..... 1,235 0 0  
 S. Chafen, Rotherhithe ..... 1,195 0 0  
 Prestige & Co., Fimlico ..... 1,186 0 0  
 A. White & Co., Rotherhithe ..... 988 0 0

**SEAFORD.**—For the Surrey Convalescent Home, for Mr. Alexander. Mr. Ewan Christian, architect—  
J. Shillito & Son, Bury St.  
Edmunds (accepted) £10,453 0 0

**SOUTH KENSINGTON.**—For the erection of a residence, in Thurloe-square, for Mr. J. Whitmore. Mr. Beynon Tinker, architect, 4, New Inn-chambers, Wyndham-street, Strand. Quantities not supplied—  
Stimpson & Co. £2,260 0 0  
J. Meers 1,550 0 0  
Prestige & Co. 1,750 0 0  
Cooke & Batsion (accepted) 1,560 0 0

**SOUTH SHIELDS.**—For works at the new cemetery, Harton, South Shields, for the South Shields and Westoe Burial Board. Mr. D. Balfour, engineer, Houghton-le-Spring—

J. Lane, South Shields £6,974 2 10  
J. Scott, Jarro 5,946 17 0  
W. Ross & Son, South Shields 5,347 0 7  
W. Kennedy, Jarro 4,954 4 0  
W. & W. Scott, Newcastle 4,630 9 1  
Nicholson & Elliot, Sunderland 4,965 13 5  
S. Mowly, Tyne Dock 4,189 9 8  
T. Dixon, Fence Houses 5,918 0 0  
J. Carrick, Durham (accepted) 3,783 10 1

**SUNDERLAND.**—For works in connexion with extending Bishopwearmouth Cemetery, for the Bishopwearmouth Burial Board. Mr. D. Balfour, engineer, Houghton-le-Spring—

Huntley, Sunderland £7,850 8 0  
W. Scott & Son, Sunderland 7,645 9 0  
T. Dixon, Fence Houses 7,346 0 0  
J. Schofield, Sunderland 6,993 8 0  
T. P. Shafte, Sunderland 6,971 15 8  
J. E. L. North Shields 6,780 0 0  
H. Rudland, Sunderland 6,627 4 0  
D. & J. Rankin, Sunderland 6,282 0 0  
J. Carrick, Durham 6,237 10 0  
R. Hudson, Junr., Sunderland 6,162 0 0  
\* Accepted.

**SUTTON-IN-ASHFIELD (Notes).** For the erection of a town-hall. Mr. J. P. Adlington, architect, Lincoln—

Shillito & Son, Bury St. Edmunds £3,000 0 0  
Saddler, Nottingham 4,159 1 0  
Keeling, Nottingham 3,300 0 0  
Perill & Burnett, Nottingham 3,234 6 8  
Adams, Nottingham 3,133 0 0  
Reidwood, Sutton 3,017 10 6  
Messom, Nottingham 3,063 0 0  
Wheatley & Maule, Nottingham 2,996 10 0  
Cowan, Lincoln 2,959 2 0  
Perks, Long Eaton 2,956 0 0  
Greenwood, Mansfield 2,910 0 0  
Hard, Nottingham 2,887 0 0  
Clark, Nottingham 2,877 0 0  
Price, Nottingham (accepted) 2,851 0 1

**TOTTENHAM.** For alterations and additions to premises, High Cross, Tottenham, for Mr. D. Quigley. Mr. J. W. Couchman, architect. No quantities—  
Wilson & Stickley £215 0 0  
Knight & Son 469 0 0  
Percival Hart (accepted) 394 0 0

**TWICKENHAM.**—For the erection of Church Institute, Twickenham. Messrs. George Lansdown & Harris, architects, Warwick-street, Charing Cross—

Messom £1,965 0 0  
W. Downes 10,040 0 0  
Lane 1,589 0 0  
H. & E. Lea 1,534 0 0  
Oldridge 1,511 0 0  
J. Tyerman 1,470 0 0  
J. T. Collinson (accepted) 1,409 0 0

**UPPINGHAM.** For the erection of new school-house and class-rooms for the trustees. Mr. T. G. Jackson, architect, 4, Nottingham-place, W.—

Dobson £10,975 0 0  
Herbert 10,040 0 0  
Thompson 9,988 0 0  
Shillito & Son 9,565 0 0  
Willcock 9,274 0 0  
Roberts 9,164 0 0  
Estcourt 8,948 0 0  
Halliday 8,900 0 0  
Farnell (accepted) 8,895 0 0

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Architects' Designs are carried out with the greatest care.

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#### GREENHOUSES,

#### WOODEN BUILDINGS.

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BOX GROUND. COMBE DOWN.

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**Asphalte.**—The Seyssel and Metallic Asphalt Company (Mr. H. Glenn), Offices, Foulry, E.C.—The best and cheapest material for damp courses, railway arches, warehouses, floors, flat roofs, stables, cow-sheds, and rooms, granaries, tin-rooms, and terraces. [A]

#### Asphalte.

Seyssel, Patent Metallic Lava, and White Asphaltes.

M. STODART & CO., Office.

No. 90, Cannon-street, E.C. [A]

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STATIONERS, &c.,

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#### S. L. WILLIAMSON,

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CHARLES COLLINGS' PATENT

COLLINGS' PATENT HINGE

LEVER, SCREW, & BARREL BOLT

Self-Acting "FALL DOWN" GATE STOP, and IMPROVED GATE FITTINGS of every Description.

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YOU CAN

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**F. BRABY & CO., 352 to 362, EUSTON ROAD, LONDON, N.**



# The Builder.

Vol. LV. No. 232.

SATURDAY, OCTOBER 6, 1883.

## ILLUSTRATIONS.

Interior View (with Plan) of the New Church of the Holy Trinity, Upper Chelsea.—Mr. J. D. Sedding, Architect ..... Four-Page Photo-Litho.  
Exterior View of Holy Trinity Church, Upper Chelsea.—Mr. Sedding, Architect ..... Double-Page Photo-Litho.  
The Oak Room, New River Company's Offices.—From a Drawing by Mr. John Crowther ..... Double-Page Typo-Gravure.

### Block in Text.

Diagrams illustrating Sir G. Molesworth's Letter on Formulae for Masonry Dams ..... Page 253

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### The Arts and Crafts Exhibition.



HIS exhibition, which was opened to the public last Monday in the New Gallery in Regent-street, is of great interest and very attractive, including some things, no doubt, which are of a somewhat *outré* and eccentric character; but, for the most part, consisting of decorative work of a high class, and marked by a great deal of originality, as well as sincere artistic feeling. It is true that one of the principal objects which was proposed when the exhibition was first planned, the bringing the actual maker of the work in direct contact with the purchaser, seems to have been only rather partially carried out. One of the first things we come to is "Design for Paper-hanging," by Messrs. Rigley and Rigley" (6), which is the old style of thing over again. A firm cannot design; it is an individual who designs; but it is to be assumed that this fact of the individuality of artistic work cannot be entirely asserted all at once, the popular belief that art is purchasable at a manufactory being too deeply rooted. We have here, at all events, an attempt in the right direction, and in a great many instances we are brought in contact with the original designer and his work, without any middleman or artistic broker intervening, which is something gained. The exhibition bears more or less the stamp of a certain clique of artists; it represents a few views and tastes of a sect; but the amount of beauty and variety in the work exhibited is a great deal for the talent and artistic feeling in the ranks of the sect, and it is impossible to go over it without reflecting what progress has been made in decorative design during the last quarter of a century. Twenty-five years ago, such an exhibition as this—so full of fine colour and outline, and devoid of anything which can be regarded as vulgar, or in bad taste, would have been impossible. Such work as fills the walls of this exhibition was hardly to be had at all, for love or money; and the most remarkable point about the present exhibition is the degree in which it bears the stamp of sincerity rather than money. It is full of things which seem to have been done because the designer and maker enjoyed doing

them: not because they were calculated to sell well. The enormous difference between this kind of work and mere trade art may be appreciated by comparing this with the kind of exhibits which used to be seen, for instance, at the Building Exhibitions at the Agricultural Hall, and which are still too prominent in the large multifarious exhibitions of all kinds of work which have become so popular of late, and in which work done with a purely artistic motive is one of the greatest rarities, and seems almost lost and out of place when met with.

In the exhibition at the New Gallery the numbers commence, as usual, in the West Gallery facing the entrance. This contains various works in embroidery and textiles of different types; tiles, metal-work, wall-papers, and some fine specimens of book-binding. In the textile designs the influence of Mr. William Morris is apparent in not a few of the examples. The characteristic which he has emphasised, and which so many others have borrowed from him, in decorative design of the foliage type, is the employment of grand sweeping curves of leafage so arranged as to fill nearly the whole space, with little "ground" left between them. It is this method of treatment which gives such a massive and rich character to many of the textile designs issued by Messrs. Morris & Co., and the spirit of which has been caught by other designers. It is nowhere better shown than in the "Silk *portière*," designed and executed by Henry and Catherine Holiday," No. 13 in the catalogue. This design, springing from a great central stalk, rising from a conventional flower-pot, is, to our thinking, too symmetrical for a *portière*, which is very seldom hung so that the symmetry of design can be seen. Where your pattern is generally likely to be seen flat and undisturbed, then indulge in symmetry on each side of a centre, if your soul longs after such symmetry; in a curtain which is constantly to be hung in folds, festooned, draped, pushed aside, symmetrical design is lost and out of place, as its symmetry is seldom seen in an undisturbed state. Otherwise this is a grand bit of work, with its great purplish serrated leaves spreading their broad surfaces over the ground. In comparing the designs in which foliage forms are introduced in this collection, one is strongly impressed with the pervading power and influence of the Greek acanthus. Where we come upon foliage design, whatever may be its varieties of colour and general effect and disposition, we never seem to be

very far from the Greek acanthus. With variations of detail its typical form and character are continually recurring; no one seems able to escape from it; a striking proof of the artistic power and influence, in little as in great things, of "the supreme Caucasian mind." Mrs. Aldam Heaton exhibits two screen-panels (11 and 16), embroidered on cloth in "tram" silk, "the ground being embroidered as well as the design." It might perhaps be questioned whether the additional effect of this embroidery of the ground was commensurate with the labour of producing it; but the procedure is in the true artistic spirit, which will spare no trouble for completeness of effect. The embroidered ground gives a unity of tone and a broken and softened colour, in place of the comparatively raw effect of a self-coloured ground. Mr. de Morgan's large "decorative panel in tiles" (17) is a striking piece of work; the main feature in the design is the conventional treatment of peacocks in side elevation, fronting inward and outward alternately, the interspaces filled up with vases and floral design. Among the pretty and original things in this part of the room is a "Frieze for a mantel valance" (20), worked by Mrs. Crane from the design of Mr. Walter Crane, in cotton on black merino; conventional animals arranged within their delicate scrolls of foliage. This is one of the numerous examples to be seen in this exhibition in which common occasions of decoration are treated in a special and original manner. A "mirror-frame" (44), by Mrs. Heaton, with floral design, embroidered in "tram" silk, is a very rich bit of effect; the design in this, as in the two others before-mentioned, is by Mr. Aldam Heaton. A "Leaf of a folding screen" (49) painted in oils on silvered and lacquered sheepskin, is a very rich piece of work, "engraved by T. Aldam Heaton, painted by Ellen Steadman." Notice the rich effect of the gold surfaces of the acanthus leaves, diapered over with a pattern of very small scrolls in relief; how different from the hard effect of a mere flat gold surface. This feeling for surface effect is one of the most marked characteristics of recent decorative work; the small diaper gives richness and softness to the surface on a distant view, and something more for the eye on a nearer view.

The end of the room is occupied by a display of works bearing the name of Morris & Co., the textiles mostly designed by Mr. Morris; two pieces of furniture, a mahogany



cabinet and a sideboard, are marked as designed by Mr. G. Jack. These are admirable specimens of furniture, notable for their simplicity of line and style, combined with admirable execution; the sideboard is especially worthy of notice for unobtrusive originality of treatment and detail. Among the few furniture exhibits, a studiously plain piano-case, "The Century Guild Cottage Piano" (128), decorated only with mouldings, is a good, unpretending piece of work in excellent taste; a novel feature in this is the vertical post at each side, at half the projection of the keyboard, connecting this, in design and construction, with the top-rail and foot-rail; the designer's name is not given. Near this are some furniture and architectural details designed by Mr. R. T. Blomfield. His gas-lantern standard in iron and brass is good in idea, but there is a weak point at the springing of the brass scrolls which support the lantern, and rise from the iron standard; the junction of the two is not very well managed. The "Grate" (98), with the panel and ornamental detail cast in brass and worked up by hand, is very good; the top-plate is decorated by a half-seen face in very low relief, with the hair indicated in incised lines, springing out into flame-like forms. One of the few things we do not like in this room is the large "Chimney-piece and Hearth" by Messrs. W. de Morgan, built up in wood coloured to imitate two marbles, white and yellow; we presume this is intended as a model only of what is to be executed in marble; but the details and profiles, even taking it so, are not refined. The "Arcaded Screen" (84), by Mr. Benson, and the large pair of wrought-iron gates in the entrance-hall (289), designed by Messrs. Robinson & Robson, are both open to the charge of too realistic work in the floral detail; in the gates there are absolutely realistic sprigs introduced, with the base of the stalk modelled as if torn from the bough. This is a mistake in metal work—a piece of false taste. Better examples of metal foliage work are seen in the bit of copper and wrought-iron railing (309) on the opposite wall, designed by Mr. G. C. Horsley, which is a grand little bit of metal detail; and the wrought-iron bracket (308) designed by Mr. Sedding, who is also the author of some fine designs for wall-papers among the set of embossed papers exhibited by Messrs. Jeffrey & Co., in the West Gallery, at the opposite end from Messrs. Morris & Co.'s exhibits. Among other architectural accessories in the West Gallery is a collection of tile designs executed by Messrs. Maw & Co. from the designs of various artists, whose names are duly given; a collection of wall-tiles by Mr. F. Garrard; and of silk and other fabrics by Mr. Thomas Wardle.

We must not quit the West Gallery without calling attention to two cases of book-binding designs by various hands. Some of these are singularly charming and artistic in feeling. Among those executed by Messrs. Burn & Co. is one designed by Mr. Philip Webb, a gold-tooled cloth design, with a small flowing design breaking out here and there into large flower forms, which is a gem in its way, and even surpasses the well-known design by Rossetti for his own volume of poems, which is placed near it. One or two others, designed by Mr. Lewis F. Day, especially No. 113, are very good, also Mr. Roger de Coverley's Milton (107), after an early Italian binding. One cannot help noticing that by the side of these and others we have mentioned, the Dante after Grolier and the New Testament after Roger Payne (105 and 106), also executed by Mr. de Coverley and Mr. Frederick Harvey, have a decidedly commonplace look; indeed, the artistic quality of the Grolier style of binding has been, to our thinking, much over-rated; neat and symmetrical as it looks, it is formal in line, and rather thin and poor in general effect. There is some interest in the same binder's examples of the old plain calf binding, in copies of Blake, Boccaccio, and Goethe (104); almost perfectly plain bindings, with just a line round the margin, and in one case the old-fashioned little leaf or sprig in the

corners; there is little to call design in these, but they are effective from their appearance of sound and lasting workmanship,—a better characteristic than that of more decorative design, combined with flimsy workmanship, which is found in so much fashionable binding of the day. The other case of books contains a series of bindings by Mr. Cobden-Sanderson, "Specimens of bookbinding in morocco, wholly tooled and worked by hand," which are admirable both in taste and execution.

But it is time to turn to the North Gallery. This is largely occupied by decorative work of a higher class—figure design applied to decoration in the form of stained glass, and mosaic and other forms of wall-decoration. The top of the room is entirely occupied by full-sized cartoons for windows and mosaic, by Mr. Burne Jones. This is work which forms the connecting link between decoration, in the merely ornamental sense, and painting as the expression of human feeling; it is painting executed with a special reference to architectural surroundings. It is the fashion now with a certain school of critics to speak of this as the highest type of painting,—a view from which we have always dissented. The highest type of painting of subjects from human life and from nature, like the highest type of poetry in literature, stands alone and apart in its interest; it is too vivid and full of life to be harmonised with any dead scheme of decoration, however rich in effect; it must be studied for itself and by itself. To make painting a part of a decorative or architectural scheme, something must be taken from the life of the painting; a procedure perfectly logical for this special end, but not exhibiting the highest expressive power of painting. A good deal of the work in this gallery illustrates this. Some of these designs of Mr. Burne Jones's, however powerful and original, in a sense seem to us to have missed both objects,—both living expression and decorative effect,—in the effort to combine both. In the cartoon for "The Nativity," for a window in a church in Birmingham, for instance, the rocky arch of the cave in which the Nativity takes place is far too realistic for decorative effect in a window; it is a mass of disagreeable dull colour, with no decorative form or surface; while, on the other hand, the angel above appearing to the shepherds, and apparently standing on the backs of the sheep, is too absurdly unreal,—a stiff, vertical figure without any more life in it than in the little men and women in the old-fashioned Noah's Ark toys. The cave portion is too realistic; the figure not realistic enough. The decorative treatment of the branches of the leafless trees, on the other hand, is masterly, and just hits the mean where sufficient life is combined with decorative effect. The cartoons for mosaic, executed at Murano for the apse of the American Church at Rome, are very interesting: the main design of the apse consists of a circular choral dance of angels, whose wings form a rich medley of form and colour in the inner portion, their feet being towards the outer edge of the space; there is a real touch of genius in this idea. The cartoon for the figure of the angel Gabriel (182) is remarkable,—indeed, one might say worse than remarkable,—for the absurdly small size of the head. It is really astonishing how any artist could bring himself to paint such a glaring contradiction of the proper proportions of the figure; this figure must be about twelve heads high. This and the vertical angel in the other design are among those perversities with which one is constantly puzzled and annoyed in the work of this remarkable and original decorative painter, who has invented a distinct poetic treatment of his own in painting, the beauty and imaginative character of which no one can deny, in spite of these occasional curious eccentricities of drawing.

The cartoons for sgraffito decoration for a church near Abergavenny, by Mr. Heywood Sumner (157 to 162), are very interesting; this is one of the best applications of sgraffito to internal decoration that we have seen, but this again illustrates the collision which takes place sometimes between nature and conventionalism, when it is attempted to combine

both. The design for "O ye winds where the winds are represented as winged figures, is very fine and effective, but, "O ye mountains and hills," with sgraffito indication of conventional landscape, we fear looks only puerile and absurd; it suggests a child's drawing of a landscape. Detail in nature can be conventionalised; but whole face of landscape will not bear it. The attempt to do it, as far as we ever remember to have seen it, only results in absurd effect of shortcoming, an attempt with inadequate means. That is one reason why landscape never answers in a stained-glass window; independently of the question of plane in a transparency, it is impossible to present landscape in that material in any way which is not a travesty; and the same is the case with sgraffito.

The same gallery contains some fine cartoons of figures for stained glass, by Mr. Holiday, who seems to have arrived at perfection in the system of treating the figure for work of this kind, and preserving the mean between naturalism and conventionalism. Among examples of decorative design with special signification, the water-colour cartoons for domestic windows, "Fire" and "Water" (212, 213), by Mr. Christopher Whall, are admirable both in design and the pleasing fancy of the ideas; water is represented by a nude figure with broad red of sea-weed growing round her, and hands uplifted holding up, at a line indicating water surface, a ship or ark; a very apt translation into artistic expression of the supporting power of water. Walter Crane's colour cartoons for mosaic (219-228) should be looked at, especially the design called "Air," and the "Eagle," "Snake," and "Fire." There is a frame of six coloured designs for stained-glass by Mr. Lewis F. Day (198-204), of a merely decorative and less fanciful order, which should be looked at as admirable bits of line and colour design precisely adapted to the capabilities of the material.

Among smaller examples of decorative detail in the North Gallery, there are some models by Mr. Osmond Weekes (240) for furniture, including two door-handles, executed in brass, which are curious and fanciful; they are apparently designed by the figure parts finished by Mr. Walter Crane; the door-handles are sea-horses or little fish so called, familiar in aquatic tanks), with their tails curled round a spindle, a characteristic adaptation of what is the real attitude of these creatures, were clinging with their tails in this way to stems or weeds. A blade for a fish-axe, executed by Mr. Massé after an old design of the date of 1725, is a charming piece of work, with a heron and fishes in silhouette entwined in conventional scrolls; compare this with the ordinary fish-scale pattern of the shops! Mr. Heywood Sumner has a plaster frieze decorations (246), of which the upper one, of a rather Byzantine character executed by Mr. P. Webb, is an unusually good example of decorative foliage beautifully designed and modelled.

Century Guild have also some plaster casts of decoration, of which one frieze in plaster for the Cutlers' Hall suggests how a new and more refined effect may be given to an ordinary type of foliage decoration by working it in very low relief. The gallery contains also a piano decorated by Miss Kate Faulkner in *gesso duro* foliage on the wood ground, gilt, and with some flowers silvered, which is rich and striking in effect, but there is a want of repose about it. "It may be art, but it would be horrid in a drawing-room," was the criticism we heard on it from a lady. That depends, of course, on what the drawing-room it was; the criticism is essentially and characteristically Platonic one; a great many English ladies will think anything out of the ordinary rustic fashionable furniture design would "look horrid in a drawing-room"; but reticence and reserve also counts for something in decoration, and we did think the example in question rather overdone; at all events, it would certainly



equire the whole apartment to be designed up to it.

The entrance-hall contains a rather miscellaneous collection of things, to some of which we have already referred. One of the most prominent exhibits is a balcony front with long centre panel and two square side panels, designed and modelled by Mr. Kellock Brown, of the "Century Guild of Artists." The middle panel contains a bronze bas-relief figure, in which the artist has paid Mr. Harry Bates the compliment of imitation: the side panels are filled up with what we should call, not scrolls, but big "wallpops" of bronze; lumps with no shape or meaning in them. We seem to have met with this sort of formless detail in other work of "the Guild." That is not "design." A scroll is a thing to be carefully and definitely designed and drawn; a mere formless curl is only a kind of indication that the artist did not know what else to do with the space, or was too indolent to take the trouble to design anything properly.

The catalogue of the Exhibition is prefaced by some essays on various branches of decorative art, mostly very well written, and containing a good deal which may be useful in setting people thinking;—those who are not accustomed to consider such subjects worth serious thought. Mr. William Morris contributes an essay on textiles, in which he makes some apposite remarks in regard to tapestry, "the noblest of the weaving arts," which may be regarded as a mosaic of dyed threads; and as to its character and capabilities he adds the following criticism:—

"As in all wall-decoration, the first thing to be considered in the designing of tapestry is the force, purity, and elegance of the *silhouette* of the objects represented, and nothing vague or indeterminate is admissible. But special excellences can be expected from it. Depth of tone, richness of colour, and exquisite gradation of tints are easily to be obtained in tapestry; and it also demands that crispness and abundance of beautiful detail which was the special characteristic of fully-developed mediæval art. The style of even the best period of the Renaissance is wholly unfit for tapestry: accordingly we find that tapestry retained its Gothic character longer than any other of the pictorial arts. A comparison of the wall-hangings in the Great Hall at Hampton Court with those in the Solar or drawing-room will make this clear to any one not lacking in artistic perception; and the comparison is all the fairer, as both the Gothic tapestries of the Solar and the post-Gothic hangings of the Hall are pre-eminently good of their kinds."

This is perfectly true, and the Hampton Court tapestries should be looked at in the light of these remarks. Most visitors, we strongly suspect, prefer the Hall tapestries, and it is true the drawing-room ones are so much faded, and seen in such a bad light, that it is difficult to do them justice; but we have always thought them the very ideal of tapestry style; the Hall tapestries are far too pictorial. Another dictum from Mr. Morris's essay we may draw attention to (always remembering that he is referring specially to textiles); "never introduce any shading for the purpose of making an object look round; whatever shadowing you use should be used for explanation only, to show what you mean by such and such a piece of drawing; and even that you had better be sparing of." And yet another quotation we may add:—"It is the pleasure in understanding the capabilities of a special material, and using them for suggesting (not imitating) natural beauty and incident, that gives the *raison d'être* of decorative art." All which is as true as gospel.

Mr. Walter Crane contributes papers on "Decorative Painting" and on "Wall Papers," Mr. Benson one on "Metal Work," Mr. Somers Clarke on "Stone and Wood-carving," and others on "Stained Glass" and "Table Glass"; Mr. Cobden-Sanderson one on book-binding, and Mr. Emery Walker one on "Printing," the artistic element in which is too often overlooked nowadays. He prints a couple of sentences in the type "now universally used for newspapers and government publications," as a contrast with an older and more artistically designed type used in the rest of the printing of the catalogue. We commend this example (page 93) to those concerned in designing

type. It is worth while to examine the two forms with a magnifying glass and notice the difference between the mechanical finish of the favourite modern type and the fine drawing of the extremities of the letters in the old model. Mr. Walker, however, finishes up with a sentiment that is very objectionable if carried out to its full extent of possible meaning:—"Next in importance to the type are the ornaments, initial letters, and other decorations which can be printed along with it. These, it is obvious, should always be designed and engraved so as to harmonise with the printed page regarded as a whole. Hence illustrations drawn only with reference to purely pictorial effects are entirely out of place in a book, that is, if we desire seriously to make it beautiful." We fear the literal interpretation of that would lead to taking the real life out of the illustrations to a novel or poem, for example, and reducing the figures to merely decorative adjuncts with no human expression or interest; the same mistake as regarding pictures only in reference to their decorative effect in the room, and not for the sake of their own expression as painted poems.

In an exhibition of decoration, however, one naturally expects to find the decorative view of art pushed as far as possible; such teaching is not out of place; it emphasises a view of the function of art which is little appreciated or understood by the general public; we only put in a caution against carrying it too far. In conclusion, we hope that the "Arts and Crafts Exhibition," now that it has made such a good start, will be an annual event. It is a real pleasure to get an exhibition of decorative work which is done for the love of art, and where one does not seem to meet with the taint of the shop at every turn.

#### THE MONUMENT.

THE recent accident to the Monument has revived an interest in this old London show, once dear to "country cousins," and a brief memorandum of its history may not be out of place. The Monument was erected in 1671-7, pursuant to Act 19. Car. II. c. 3. The cost, about 14,000*l.*, was defrayed from out of the Orphans' Fund. It rests upon a stone vault, and is built of Portland stone. The pedestal, 27 ft. high (excluding the base), is 2½ ft. square on plan, and the Doric pillar, which was fluted after the masonry had been carried up, and has an extreme diameter of 15ft., rises 133 ft. to the balcony. The cippus, cupola, urn, and flames reach to 38 ft. above. Wren's original design was for a less simple memorial: a shaft with volumes of flames bursting forth at intervals, and surmounted with a Phoenix—this and the flames to be of brass, gilt. This he ultimately rejected, fearing that such a building would prove too costly, and offer too much surface to the wind. His design, preserved at Oxford, has been engraved by Mr. W. Hulsbergh. On the pedestal's western side is Cibber's composition, partly in alto-relievo, of Charles II. and the Duke of York, in Roman guise, with Architecture,—a gaunt woman holding instruments and a plan,—and sundry other allegorical figures. These, excepting Envy in her cavern, spouting fire, encourage London, who languishes in the arms of Time. In the background is an interesting group of masons and scaffolding of the day. The two Latin inscriptions were composed by Dr. Gale, afterwards Dean of York. The phrases around the pedestal, in libel of the Papists, were inserted by the Corporation at the time of the Titus Oates plot, and having been erased *temp.* James II., were re-cut in his successor's reign. On the 26th of January, 1831, they were finally obliterated. The Monument was for some while used by the Royal Society, who found, however, that vibrations caused by the passing traffic to and from old London Bridge affected the accuracy of their astronomical adjustments and observations. Whilst the road-traffic is now lessened, the rail-

way station by Eastcheap, and that of the new City of London and Southwark Subway, are in close proximity. The best views of the Monument are to be found in the measured drawings, with the Trajan column to scale, and a few particulars from "Parentalia," of J. and T. Taylor (1791), W. Lowry sculptist; and of N. Hawksmoor (1723), W. Hulsbergh sculptist. W. Marlow's fine view of Fish-street-hill, looking south, was painted in 1792, and engraved in line by Thomas Morris, a pupil of Woollett; it was published by John Curtis, at Twickenham, on November 4, 1795. The Sir Balaam, commemorated in Pope's third epistle to Lord Bathurst, as dwelling in Monument-yard, is identified with Thomas Pitt—died April 28, 1726—who, when Governor of Fort St. George at Madras, purchased for 20,400*l.* the celebrated diamond, and was grandfather to the statesman Earl of Chatham. A considerable portion of Monument-yard was pulled down in 1880-1, and with it, we believe, the house of Jacob, the benevolent chemist. Here, in February, 1756, after his brief sojourn "among the beggars in Axe-lane," Goldsmith found employment as an apothecary's assistant, until his quondam fellow-student, Doctor Sleight, and Jacob, set him up as a physician in Bankside. Hogarth, who once lived, it is said, on old London Bridge, gives a view of Monument-yard in his Lottery plate.

The fall of stone from the Monument, presumably owing to the decay of part of the structure, again opens the question as to the desirability of using limestones in the construction of public buildings in the metropolis. At the time the Monument was erected, its celebrated architect was quite justified in using Portland stone, as it was not only the best available material, but was in the London atmosphere of those days, eminently suitable in point of durability. Times have, however, now altered; the extension of this vast city, with its many manufactories, has contaminated the atmosphere to such a degree that limestone is more or less rapidly destroyed by its action, and even the splendid material used by Sir Christopher Wren has suffered with the rest. Now Wren is noted for the care he bestowed in the selection of his materials. It is a matter of history that the Portland stone used in St. Paul's Cathedral is not the same as the Portland stone of to-day; it has been shown that the quarries whence he obtained the limestone were situated in a different part of the Isle of Portland from the present workings. We have it on good authority, also, that the principal reason of the abandonment of the old quarries was because the stone was harder and more difficult to work than in the other and more recent openings. Competition, as usual, has wrought this result. When, therefore, we speak of the durability of Portland stone, it is well to define the particular quality referred to. There are at least five different qualities in the island worked at the present day. The best is undoubtedly the most serviceable and durable limestone in the market, and will last as long as, if not longer than, any other kind of freestone in the London atmosphere. But no freestones are very durable in it. Sooner or later the hydrochloric and sulphuric acids, beaten into the stone by the action of rain and wind, will honeycomb the surface and lead to general disintegration. Nothing can now equal the more non-absorbent, compact sandstones with siliceous matrices devoid of carbonate of lime; or better still, the fine and medium-grained granites, for the construction of public edifices within this smoke-begrimed city. At the same time, we can hardly agree with the writer of a letter which recently appeared in a daily paper, suggesting that "it would be very undesirable to repair the monument on Fish-street-hill with the perishable material of which it is built." We do not apprehend that the decay of the column is very far advanced, and if a little extra care be exercised in its selection, we should think that the best variety of Portland stone might very well be used to restore it with, rather than introduce a foreign substance. It would be a different matter were another



Monument about to be erected. We should then recommend the use of the more durable materials.

## NOTES.

**I**t appears that no assistance will be forthcoming either from the English or French Government towards the representation of English art at the Paris Exhibition of next year, and Sir F. Leighton has, through a letter to the Lord Mayor printed in the *Times* of Tuesday, called on those who feel a patriotic interest in the adequate representation of English art at the exhibition to assist this end by subscribing money for the necessary expenses, and by the loan of valuable works of art. In regard to the former end, the President of the Royal Academy has set an example with a cheque of 100*l.* towards the expenses of the undertaking, which will probably amount to about 3,000*l.* It is to be hoped that an effort will be made to have a fine collection of painting, sculpture, and architectural and decorative design, to represent the art of this country, on an occasion when there will probably be such an unusually large and varied congregation of spectators from all parts of the world.

**I**n reference to our foot-note to Mr. Ralph Nevill's letter last week, we find it was not in a letter of Mr. W. H. White's in the *Times*, as we thought, but in a paragraph in the *Institute Journal of Transactions*, that we had seen the names of two eminent church architects mentioned as specially responsible for the "General Advice" as to church restoration. While referring to the subject, we may observe that Mr. Nevill, in the aforesaid letter, did not apparently quite understand our view of the matter. We do not dispute that the architects named (Mr. Pearson and Mr. Blomfield) were specially qualified by special knowledge and experience to instruct in regard to the conservation and restoration of churches, provided that the principle be once accepted that every particle of old work is to be considered as worth preserving because it is old, even by such methods as scarfing on new feet to old roof timbers, or cutting off the outer half of a mullion and pinning a new one on. If that view is adopted, no one knows better than they how to direct operations. But the question whether that is a reasonable view to take of the whole subject is the very one which is in dispute; and what we implied was that "General Advice" had been issued as the advice of the Institute of Architects, which involved a principle of treatment that we are by no means sure that the Institute as a body would pledge itself to: that it is the principle of one sect, not of the whole body.

**M**ANY of our readers will have heard with great regret of the death, on the 28th September, of Mr. T. Gambier Parry, at his house at Highnam Court. Mr. Parry was, as every one knows, one of the most noted and gifted of the band of amateur ecclesiastical artists and art-lovers who were part of the production of the great church revival movement of this century. Mr. Gambier Parry, however, was more fully and truly an artist than most of his compeers in the same band. His decorative painting at Ely Cathedral was a very important work, as well as his decoration of the church which was built at his own cost at Highnam; and his development of the spirit fresco process of painting was an important practical contribution to the technique of the art. It must be admitted, however, that the work at Ely and Highnam must be judged by a different standard from that which we apply to the leading artistic work of the day; it is essentially amateur painting, though amateur painting of an unusually high class. Mr. Parry's rather recently published volume of artistic essays\* contained much beautiful writing on art, and is the index of a highly refined, sensitive, and cultivated mind. Mr. Parry's personal manner and appearance harmonised remarkably with his artistic

repute: he impressed one, as we heard it remarked, with the idea that he was one of the Italian Renaissance artists come to life again in the nineteenth century. He leaves a wide circle of friends by whom he will be regretted, both on public and private grounds.

**D**R. HUMANN, the fortunate discoverer of the great Pergamene altar, has again lighted upon archaeological remains which promise to be of great historical importance. Under the auspices of the Berlin Oriental Society, he, together with Drs. Instam and Winter, have been on an exploring expedition in North Syria, with a view to investigating the numerous artificial tumuli there, which it was supposed contained "Hittite" remains. As long ago as 1883, when Dr. Humann was on his way to Nimrud, he had possessed himself of a relief in "Hittite" style, representing a lion hunt; and Handi Bey, Director of the Constantinople Museum of Antiquities, had noticed in one of the tumuli some reliefs still standing upright. The excavations set in hand have already laid bare a building which seems to be a sort of propylæa, adorned with forty reliefs found actually *in situ*. In this propylæa stood the colossal stele of King Assarhadan. It is covered with inscriptions in cuneiform, and records the war of Assarhadan against Egypt (B.C. 687-600). The reliefs are of colossal size, and have with the greatest difficulty been transported to the harbour of Alexandrette. Thence it is intended that specimen slabs should go to Berlin, while the main bulk of the sculptures must be taken to Constantinople. This "find," together with the great Sidonian sarcophagi, make the Constantinople Museum a place with constantly-increasing claims on the attention of archaeologists. It is somewhat curious that Dr. Humann's first archaeological discovery should open up a new chapter in the history of late Alexandrian art, while his present discovery sheds new light on the early epoch of Hittite influence.

**I**N England we have placed our Law Courts, in which the internal space has been economised so as very largely to detract from their usefulness, well within the reach of all who have need to go to them. In Belgium, on the other hand, the Government not very long ago opened new Law Courts, of which the internal arrangements are large and ample, but to which the access from the lower part of the town is bad. It is quite clear that this vast pile, the delight of modern Brussels, should have a boulevard cut direct to the Bourse, or Hôtel de Ville. At present it is difficult to say whether it is most disagreeable to go up to the Law Courts in a carriage or on foot, through the narrow, steep, and badly-paved streets which lie between the two points we have indicated and the Palais de Justice.

**I**N spite of the number of new bathing resorts which have within the last few years come into notice on the Continent, Wiesbaden not only holds its own, but grows. This is not surprising when we bear in mind that travelling and tours have immensely increased among the Germans during the last ten years. The drawback to Wiesbaden, from a health point of view, certainly is that the best hotels are clustered in a group round the hot springs, in the very hollow of the valley. Wiesbaden in the summer-time is thus, to those who frequent the hotel where the English most resort, decidedly enervating. There seems to be a want, indeed, of a large and airy hotel higher up the sides of the valley, in the higher part of the Taunusstrasse, or among the villas along the chestnut-lined Kapellenstrasse; but if the hotels stand low, the villas are fast creeping up the sides of the valley and almost up to the wooded Neroberg. The situation which many of them occupy is as fine as any in Germany, with many miles of the Rhine-plain spread below and wooded heights above. They are noticeable, too, for the variety of the materials of which they are constructed. Some of them are white, of a light stone;

others are covered with cement or plaster; others, again, are built of a rich red brick which is warm and pleasant to the eye; while of not a few the material is brick of a delicate terra-cotta tinge. There is nothing pretentious about the architecture, though it may also be said that none of the buildings aim at being strikingly picturesque. But they have a substantial, pleasant aspect, and must add largely to the attractiveness of Wiesbaden for those who desire to make it a residence.

**I**N a leading article upon the project to erect a suitable memorial in Fulham churchyard to Theodore Hook (born Sept. 22, 1788; the *Times* upbraids the present generation as one "which is satisfied to forget the spot in which Sterne was buried." Sterne, who died in Old Bond-street, where, we take it, is now Agnew & Co.'s, was buried in the St. George's Hanover-square, parish ground, Bayswater-road, which was planned in 1764, near to the then Tolmin's farm (see Wallis's map). On August 6 last we saw the later grave-stone, amongst the grass knee-deep. Above 6 ft. high, the headstone stands beneath a large plane-tree, just 5 ft. distant from the western wall, and close by No. "7" tablet of the wall, about midway towards the north. The stone is inscribed as under:—

Alas! poor Yorick!

Near to this Place

Lies the Body of

The Reverend Laurence Sterne, A.M.

Died September 18th, 1768.\*

Aged 55 years.

Ab! Molitor Ossis quiescant!

Beneath this are added the following still panegyric lines:—

This Monumental Stone was erected to the memory of the deceased by two BROTHER MASONS, for although He did not live to be a Member of their SOCIETY. Yet, all his incomparable Performances evidently prove

him to have acted by Rule and Square: they rejoice at this opportunity of perpetuating his high and irreproachable Character to after ages.

W. S.S.

**O**N Monday last the proprietors and manufacturers of the Grinnell Automatic Sprinkler gave a practical illustration of the action of this apparatus at Ransome's Dock, Battersea. The distinctive features of the device are an elastic valve-seat, which acts like a cup-leather, becoming tighter the more the water-pressure increases, and a rigid valve, so fastened as to relieve the low-fuse solder-joint of nearly all the strain. Encircling the sprinkler or nozzle is a heart-shaped frame, placed in a vertical plane. The valve is held in its place by a curved piece of metal which forms a lever of the third order, the resistance being represented by the soldered joint, the work by the water-pressure, whilst the fulcrum is formed by the end of the lever, resting in a notch in the heart-shaped frame. In this way, it will be seen, three necessary features in the design of a successful sprinkler are attained:—Firstly, that the valve will not sprinkle under an excess of pressure when not required to perform its function; secondly, that the soldered joint is not subjected to any great stress; and, thirdly, that the joint is removed from the cooling action of the water. Another advantage accruing from the elastic seat is that the water-joint remains unbroken until the solder is quite melted, and the valve is free to come right away. This is also an important point, as a gradually opening valve will allow water to trickle through, and so stop further action by its cooling effect. When the company arrived on the ground they found a wooden shed 18 ft. by 18 ft., and 12 ft. high. The floor of the shed was covered with several sacks full of shavings which had been soaked with petroleum. A match was applied to this highly combustible mass, and in a couple of seconds the whole building was a mass of flame. For 3-in. sprinklers were fitted, and in a few seconds these began to act, and in a minute or less the fire was fairly subdued. The roof of the

\* "The Ministry of Fine Art."

\* Month and day are wrong.



ed, which, of course, was above the sprinklers, was scorched, but otherwise no damage was done. A small turbine is placed in the service, and this sounds a gong as soon as the water begins to flow in the sprinklers, thus giving an alarm. Several representatives of various fire insurance companies were among the spectators, and these gentlemen were of opinion that they could build a fire in such a way as to avoid the action of the apparatus. The only way, however, in which they could achieve success was in making the fire so small that the heat did not ascend sufficiently high to melt the solder, and, as the melting-point is 5 deg. F., it is needless to say the roof was injured. As evidence of a belief in the efficiency of this system, it was stated that Miteley's big shops and store-rooms at Westurne Grove have been fitted with it throughout, and that the insurance companies have consequently accepted the risk, whereas before they would not insure the premises at a premium. The manager of one large company stated that the fitting of the installation would be paid for in five years by the saving in premium. The water may be supplied by the ordinary service, but the insurance companies require an additional supply. For this purpose it is usual to fit a tank at a sufficient height, the water being merely raised by a small Worthington pump. Messrs. A. Ransome & Co., of Ipswich, are the agents for the apparatus.

WE regret to learn, from the *Leicester Daily Post* of Wednesday last, of the serious illness of Mr. Joseph Gordon, M.Inst. E., the Borough Surveyor of Leicester. For some time past, as has been pretty well known locally, the strain on Mr. Gordon's own health has been exceptionally great, owing to the culminating pressure of his labours in designing and superintending the important flood-prevention works (illustrated and described in our columns about a year ago), the extension and partial reconstruction of the main drainage works, and the new sewage irrigation works now in progress at Beaumont Leys. Mr. Gordon was formerly City Surveyor of Cardiff, and is well known on the Continent in connexion with sanitary engineering. As assistant engineer, he carried out the sewerage of Frankfurt and other important towns in Germany.

THE *Times* devoted a very reasonable and all-round kind of article, on Wednesday, the subject of the conservation of Croyland Abbey; a kind of *epitome* intended to show how in this kind of duty to a ruined abbey all might agree, the Institute of Architects, the Society of Antiquaries, and Lord Grimston and all. As to the latter, we take it that what he wants is only to be quarrelling with some one, no matter who, so long as he can scold them and advertise "my Book on Building"; but the amusing part of the matter is that the *Times* reminds its readers how satisfactory it is to know that Mr. Pearson has been entrusted with the supervision of the works. "His name is a security that the modest sum at which the necessary expenditure is estimated will be devoted to the preservation of an ancient fabric, and not to the glorification of a modern architect." Just so. But why does not the *Times* carry the same argument into other cases of restoration, and point out what a security it would be if the necessary work at St. Alban's were entrusted to Mr. Pearson, instead of being carried out, in a bungling manner, "to the glorification of a modern" lawyer?

**Lectures in Architecture at the Royal Academy.**—Mr. G. Aitchison, A.R.A., Professor of Architecture in the Royal Academy, is specially announced to give a course of six lectures on "Roman Architecture" to the students of the Academy, on the following dates:—Monday, Jan. 28, 1889; Thursday, Jan. 31; Monday, Feb. 4; Thursday, Feb. 7; Monday, Feb. 11; Thursday, Feb. 14.

# LETTER FROM PARIS.

SINCE our last letter a new strike has supervened at the Eiffel tower. Alleging the increasing dangers and difficulties to which they were exposed as the tower rose higher, the men made demands to which M. Eiffel refused to accede. As time pressed, however, the latter offered an increasing scale of wages as the work went up, and a final bonus of 100 francs to every workman who worked up to the highest platform. This was accepted, and the men resumed work on this considerable increase in prospective wages.\* The tower is now at half its height; the question of its decoration is already under consideration, and a warm, reddish tint has been selected for the main colouring.

The constructive framework of all the great palaces on the Champ de Mars is now completed; and in front of their long perspectives of girders and roof lines, along the riverside, stretches a set of smaller buildings, whose incongruous architecture and varied forms have an effect of piquant originality. It is here that M. Chas. Garnier has had reared the specimens of human habitations of various ages and countries: a small town, comprising about thirty "restored" houses, of which not one is of the same architecture and arrangement as its neighbour. Below the Pont de Jena is a Scandinavian house of timber; by its side a Romanesque dwelling, with its round arches and narrow windows; further on a Medieval house, with a half-timbered gable; a Renaissance tower; a Byzantine house, with heavy columns; and a Russian dwelling, with its bulbous cupola. Then, by the side of an Arabic house, with its flat roof, are seen the huts or wigwags of savages (Esquimaux, Laplanders, Red Indians), and the habitations of Aztecs and Incas. This gallery annex leads to the esplanade of the Invalides, where the Algerian and Tunisian pavilions are now far advanced, and near them the large building by M. Grauit for the Palace d'Hygiene. A little further on the Ministry of War has had a regular citadel built, and fortified with ditches, casemates, and glacis on the old system. Near this is a large circular building intended for a panorama. Of the two panoramas of the Exhibition, the first, of which we are speaking, will transport the spectators to the large "refuge" of the Place de l'Opéra, where the painter, Castellani, has undertaken to group in the footwalks of the surrounding boulevards all the notabilities of Paris, political, literary, and artistic, &c. The second panorama, situated before the façade of the Exhibition, on the bank of the river, will represent a large steamboat of the Transatlantic Company, with a panoramic view of the port of Havre on each side.

It is of interest to note the important part which ceramic work will play in the decoration of the various pavilions on the Champ de Mars, especially in the domes and façades of the work designed by MM. Bouvard and Formigé. The execution of this work will be confided to MM. Emile Müller, Parvillée, Noel Raffier, and Liebnitz.

The Fine Arts department of the Exhibition, it is now decided, will be divided into six sections, as follows:—

In the Palace des Beaux Arts will be formed the retrospective exhibition of French art since 1789, as well as the exhibition of French and foreign works of art executed during the last ten years (1875 to 1889).

In the Trocadéro will be the exhibition of the department of the Monuments Historiques, including casts, sculpture, drawings, metal work, and photographs.

In the Palais des Arts Libéraux the exhibition of instruction in drawing, and the theatrical exhibition (models, decorations, costumes, mechanism, lighting, &c.).

In the central cupola of the Galeries de l'Industrie, the retrospective exhibition of national manufactures since 1879.

A new line of railway will shortly be opened, partly to facilitate access to the Exhibition, on the left bank of the river. Starting from Puteaux, it will have its terminus for the present at the Champ de Mars, and after the Exhibition is over, at the Invalides. This line, which follows the bank of the river, will serve various localities, and some pretty railway stations are already built at Suresne, St. Cloud, Sèvres, Bas-

\* The difficulties raised by the men, unless they were a mere pretence to claim higher wages, do not give a favourable idea of the courage and stamina of the French worker. One can hardly suppose a set of English workmen would strike on the plea of their heads being turned by the height at which they had to work.

Meudon, Issy, and Grenelle. Suburban travelling is also to be further facilitated by a new line to be opened shortly between Argenteuil and Mantes, constructed at a cost of about thirty millions of francs.

At Clamart, not far from the new Puteaux railway, rises a great pile of buildings commenced ten years ago, and which is now to be inaugurated. This is the Hospice Ferrari, founded by the Duchess of Galliera. It is designed by M. Ginain, also the architect of the new Galliera Museum, in course of erection. The architecture of the hospice externally, in virtue of its round arches and its portico, may be considered to belong to the Italian Renaissance, while the chapel, with its large mullioned windows, rather recalls the French architecture of the sixteenth century. The building is a fine one architecturally speaking, and very well planned and constructed for its purposes as an infirmary.

From the architectural point of view, there is little to be said, certainly, as to the isolation hospitals which are shortly to be erected in the suburbs of Paris; but the scheme is an important one from a sanitary point of view. Six hospitals for contagious diseases are to be built, designed with great simplicity by the architects of the department of "Assistance Publique." Two of them, intended as smallpox hospitals, will be built to the north and south of Paris respectively. A third, reserved for diphtheria, which makes great ravages in Paris from time to time, will be built on the road to Fontainebleau. At Ivry will be the one intended for measles, and at Créteil there will be a convalescent hospital and a hospital for contagious skin diseases.

The principal façade of the Sorbonne, towards the Rue des Ecoles, is just completed, and the interior fittings commenced. The architect, M. Nenot, is to commence next month the large buildings which will extend along Rue St. Jacques and Rue Cujas. This part of the building, the architectural design of which is very simple, is intended for the Faculté des Sciences, and will cost about thirteen millions of francs.

The monument erected in Rue de Rivoli to the memory of Admiral Coligny will also be soon completed. The architectural portion of the monument, which has been built adjoining the chevet of the Calvinistic Church de l'Oratoire, is designed by MM. Sellier and Gisors, and consists of a white marble cenotaph, which will be decorated with medallions and surrounded by a statue of the Admiral, of which we have already published an illustration.\* The design will include also two allegorical statues, the work (like the portrait statue) of M. Crank.

The Cour du Carrousel is at last disencumbered of the medley of constructions which have been there so many years. The laying-out of a square can now be commenced, which will give some dignity to the site in default of a building; and one would prefer flowers and shrubs there, certainly, rather than the Museum of the French Revolution, which has been talked of, and which would cost a great deal of money, and present only a very meagre interest, if one may judge by the puerile nature of the collection of the same kind in the Carnaval Museum.

The Service des Bâtiments Civils, concerning the negligence and inertia of which we have often spoken, is about to be considerably modified in regard to general organisation. In pursuance of an agreement come to between the Ministry of Fine Arts and that of Public Works, all the civil edifices intended for public service will now be attached to this latter department; while all public edifices having a character exclusively artistic, such as palaces and public monuments, statues, triumphal arches, fountains, &c., will remain under the administration of the Ministry of Fine Arts, and will be attached to the Service des Monuments Historiques.

It may not be without interest, in regard to this subject, to say something in regard to the working of the Service des Bâtiments Civils, the administration of which is divided into four offices united under a Director-General (M. Jules Comte). The buildings taken under its care are grouped in four sub-divisions, each comprising about one-fourth of the public monuments of Paris and a certain number of buildings situated in the Departments. At the head of each division is an Inspector-General, having under his control the architects who have charge of the different buildings,

\* See *Builder* for January 29, 1887.



whose fees are calculated on a basis of 4 per cent on work required to keep the buildings in proper repair, and 3 per cent. on new work or extensive repairs. The architects are each the head of a staff composed of Inspectors, sub-Inspectors, and "conducteurs de travaux" having fixed salaries, and a "verificateur" who receives 1 per cent. on the amount of accounts certified. As a matter of fact, the first division, which comprehends the Departments de l'Ouest, has not its titular head, and there are only three Inspectors-General actually in office. These are, for the second division, that of the south-west and south, M. Charles Garnier; for the third division, that of the Departments of the north and east, M. André; and for the fourth division (Departments of the centre and south-west), M. Diet. The four Inspectors-General compose, with the addition of four temporary members, a secretary, and a "Contrôleur," the Conseil-General de Bâtiments Civils, presided over by the Minister of Fine Arts, and which has for its mission to give advice upon all questions of art, construction, accounts, matters of litigation, city roads, &c., which are submitted to it by the Ministry of Fine Arts and the other Ministries. The amount expended annually by the Service des Bâtiments Civils for keeping buildings in repair (*entretien*), and for larger repairs and new additions, is about fifteen million francs. This is obviously insufficient for the purpose, and it has required a violent campaign in the Parisian press lately to extract from the Government the sums necessary to prevent the Palace of Versailles from falling into ruin.

In the competition for the Prix de Rome, the Académie des Beaux Arts has given the following awards:—The Prix le Prince has been awarded to M. Convers (sculpture), M. Tournaire (architecture), and M. Leriche (engraver). The Prix Delanoy has been awarded to M. Tournaire; the Prix Piguy to M. Sortais (architecture); the Prix Hussion to M. Sortais also; and the Prix Cambacères to M. Theunissen (sculpture) and M. Leriche. In addition, four years in Rome, will have for three years the benefit of the bursary of 4,000 and 3,000 francs founded by the Comtesse de Caen.

The administration of the manufacture of Sèvres are about to organise an interesting exhibition of paintings, cartoons, and drawings, which have been made for the execution of vases by Mme. Escalier, recently deceased, who was one of the best artists of the national manufactory.

The world of art has suffered a great loss since our last letter in the death of the painter Boulanger, at the age of 64, and when nothing led to an expectation of his end being so near. He was universally esteemed for his excellent qualities as a man, as well as for his artistic requirements. Gustave Radolphe Boulanger was born at Paris on April 24, 1824. He was successively pupil of Paul Delacroix and of Jollivet, followed also the curriculum of the École des Beaux Arts, and obtained the Grand Prix de Rome in 1849. During his residence at the Villa Medici he devoted himself to Latin archaeology, which formed the basis of a great many of his paintings, among which we may specially recall "Une Répétition dans la Maison du Poète Tragique de Pompeii." He took for his background the Pompeian house built for Prince Napoleon at Paris, and introduced, in Roman costume, the principal literary celebrities of the Second Empire. He did the same kind of thing in the large picture commissioned from him for the Mairie of the XIIIth arrondissement, where may be found the likenesses of Cabanel, Arago, Guillaume, Dumas fils, Charles Garnier, &c. Among others of his principal works may be named "Julius César à la tête de la X<sup>e</sup> Légion," "La Via Appia du Temps d'Auguste," "L'Intérieur du Gynécée," &c. His most important work was the decoration of the foyer du dance of the Opera House, the eminent architect of which was one of his closest and most intimate friends. It was as he was leaving the house of this old friend that he was seized with a sudden and fatal illness, leaving behind him the recollection of a laborious career entirely devoted to art. He had obtained various medals in different exhibitions, and the Cross of the Legion of Honour, and was made a member of the Institut in 1882. He was also a professor at the École des Beaux Arts.

Boulanger has painted also a number of Oriental scenes, among which class of work may be found some of his best productions. Unfortunately, the precision with which he

Painted the minutest details often imparted to his pictures a certain hardness, which was especially perceptible in his later works, not least so in the "Esclave à Vendre" of this year's Salon.

#### MISTAKES IN ARCHITECTURE.\*

"We are all of us wrong sometimes": so spoke, in the hearing of a friend of mine, one of our best-known humourists and men of letters. They were together on a steamer, and were watching the floundering of a sailing-boat being navigated by a mariner who clearly had made a mistake in handling his craft. The famous man had a young daughter with him, and she asked, "What, pray what, is he doing, father?" and got the reply, "He is wrong, my dear; we are all of us wrong sometimes."

No truer word was ever spoken; and, if for no other reason than because it is so universal a fate to get wrong sometimes, mistakes would be justified as a subject for a lecture. But there is a much better reason for my selection of this subject. Forewarned is fore-armed; and, though I cannot promise you an immunity from all mistakes, I can, I hope, point out some into which there might perhaps be some danger of your falling, and against which you will be likely to guard if your attention has been called to them.

A mistake is always an evil, and often a most serious evil. There are mistakes which a man may make inadvertently, and without blame, but which yet entail consequences more serious and lasting than those which follow many a crime. Shakspeare paints Wolsey as arrogant, unscrupulous, shrinking from nothing so that he might compass his ends; yet it is not any of the dark deeds with which he is credited that ruins him, but the blunder of laying a paper intended for his own eye alone before that of the king. It is only a mistake when a signalman gives the wrong signal, or a pointsman turns the points the wrong way, but it may lead to the slaughter of a score of innocent persons; or, to come nearer home, it is only a mistake to miscalculate a girder, or misjudge a foundation; yet it may lead to the ruin of a fine building and of its architect's career.

If, then, you succeed hereafter in steering clear of even a few mistakes in consequence of their having been pointed out here, that will be ample justification for our spending an hour together about this somewhat uninviting subject. I propose that we shall take up in the first place students' mistakes, and secondly those of architects; and, though I will try to be orderly, I greatly fear that, as mistakes are subject to no rules that I know of, a discourse on them must of necessity be rather an irregular lecture. We shall, of course, have to leave unnoticed far more mistakes than can be considered; mistakes will therefore be selected which are, in the nature of things, not unlikely to occur. Many of them will be such as have actually come under my notice; and, in clearing some of them up, I shall ask leave now and again to borrow a hint from the proverbial wisdom of our forefathers.

There is one peculiarity about mistakes, and that which originates them, which makes it not a little difficult usefully to consider them in a mixed assembly. I allude to the difference in mistakes traceable to the wide differences in temperament, training, quality of mind, and habits between different men. Put two men to the same test, and they act differently. If that test be some circumstance in architectural study or practice, where there are several ways of going wrong, and but one of going right, each of them may make a mistake; yet it is all but certain that they will not both make the same mistake; they may each take a wrong road, but the roads will go in opposite directions. In acting as assessors in architectural competitions I have again and again seen this. One designer, for example, who is timid and perhaps inexperienced, with but cramped ideas, falls into the mistake of producing a formal, cold, spiritless design, correct perhaps, and possibly economical, but showing so little invention, and with so little worth remark about it, that it has no chance. His neighbour lets loose a fancy and fertility of design of which he is the fortunate possessor, utterly regardless of considerations of expense or suitability, and produces a splendid plan for a building that could not be put up for three times the money, and

that, if erected, would be quite inappropriate to the site and purpose, and of course his failure is as complete as that of his rival.

Each of these two competitors has made the mistake of failing to understand what was wanted, but the failure has been in opposite directions. No. 1 has fallen short, No. 2 has overshot the mark. I shall have occasion in the course of the lecture to mention other mistakes which, so to speak, hunt in couples from the reason, and we may rest assured that many a man who is safe not to make a mistake in some one definite direction may be in great danger of running to the opposite extreme.

#### Students' Mistakes.

To turn now to students' mistakes. The one which first seems to present itself is neglected opportunities. This, when willfully done, is vicious; but it is a mistake often made out of pure thoughtlessness. Many a youth fails to realise that when he left school or college he entered an office he embarked upon a quite new career, and that he has to acquire knowledge in a different way, and to enter upon a totally distinct education. At school or college the schoolmaster or the professor teaches; in an architect's office the principal gives opportunities. The schoolboy, or, to a certain extent, the collegian, gets into difficulties if he omits to neglect to learn. There are no equally immediate uncomfortable results if a pupil neglects his opportunities; but, nevertheless, the loss to him is serious—in some cases irremediable, though in most instances, as I have said, I believe this neglect to arise entirely from failing to comprehend the situation, and not at all from willfulness or idleness.

Every chance of taking part in what an architect or his assistant have to do in actual practice is an opportunity, even copying a letter, making a tracing, or entering a message in a call-book, is a lesson if the pupil chooses to learn from it; much more valuable are the chances of seeing work and materials. The nature and use of these opportunities have been dwelt upon very thoroughly in some of the published addresses of recent Presidents of the Architectural Association, and, to some extent, by myself on a former occasion of this sort; that I hardly need pursue the topic further, but may turn to mistake number two.

It is a great mistake to lose heart and give up. I believe there comes to most young men a time when the novelty of their change of occupation and position has worn off and the irksomeness of routine is being felt, with possibly the depression due to being in lonely lodgings, instead of at a bright home or in the sixth form of a busy school, and the wish to give up rises. Fortunately, this is practically impossible, and the student feels obliged to stick to his work, gets over his difficulties, regains heart, and goes on. If time and tone are often lost in the struggle, and it is a thing to fight against. Be assured that, if your profession has been chosen with any degree of care, you are more likely to better yourselves by a change, or, at that to begin business life by losing a year or two, and starting afresh with the consciousness of a failure behind you, is to say the least of it, unfortunate. Of course occasionally a student turns up of whom one must in honesty say that the greatest mistake of his life was adopting the architectural profession. If a man is thoroughly unfit for a calling on which he has entered, by temperament, training, and habit, and he and his friends become honestly and deliberately aware that this is so, of course he is only wise thing to do is to stop. But for the person who has really made such a mistake, there are probably a score who, for a time, far they have done so; therefore it is far safer to urge you to resist giving up than to suggest as a good thing to do. Remember that "rolling stone gathers no moss," and "Fate never won fair lady."

It is not, however, only the pupil who is so to lose heart. There is a good deal of discouraging and difficult business to be got through by many young men in the interval between their articles and their start in practice, and again in the early days of practice. In all these difficulties, whatever you do, do not allow yourselves to be cast down. Constancy to a career is a matter to some extent, nay, to a very great extent, under man's own control, and the man who succeeds is the one who resolves stoutly that he will not be rebuffed or disappointed, or perplexed, or never so trying, he will not allow himself to master him, and who carries out that resolve.

\* By Professor T. Roger Smith, F.R.I.B.A. Being the opening lecture at the commencement of the session 1888-89 at University College, London.



The young man, perhaps fresh up from the country, who goes round to the offices of one architect after another, and who answers every advertisement in the papers in the hope of getting employment, is on a very trying quest. But he is doing what most of us have had to do before him, and he is engaged in a way which has procured for many a man the opportunity of earning his daily bread, and for some has proved the first step in a career that has led to brilliant success. One of the most distinguished professional men of the day began his London career, when an unknown foreigner in our city, by answering the advertisement of a leading architect who wanted a young man to do nothing but trace in his office. This humble post he took, and filled studiously till it was found how well he could do very much better work; and now his name is on every one's tongue. The proverb to take up when seeking for employment is, "Leave no stone unturned."

To the more advanced man, who is feeling,—as who among us does not sometimes feel?—that it is very hard to get on, I may perhaps offer the suggestion once made to me by a very successful man when I was complaining that I found it difficult to get on. "Do not forget that the difficulties are your security."—a consideration which has so much in it when one comes to turn it about in one's mind that I do not think any words of mine can add to its force.

One more proverb occurs to me, "Everything comes to the man who can wait." Everything that can come of itself seems to obey this law. Success is not quite included here, because,—at any rate in professional life,—success can only come to the man who is fit to succeed. But granted the fitness (and I trust you will fit yourselves for success before your student career comes to a close),—granted the fitness, I repeat, even in so crowded a profession as ours and so enormously difficult a place as London, success may fairly be expected to reward each man who can go on bravely struggling for a sufficiently long time and who will not lose heart.

Once more, it is a mistake to lose heart if any particular attainment seems to elude you. Say you decide to draw the figure, the most valuable auxiliary to high-class architectural draughtsmanship, and you find it very difficult, or you decide to draw perspective, and you find it very perplexing. The thing to do is not to give up, but to go on; and if the difficulty takes twice the time and twice the trouble which it appears to have cost some comrade, believe me the acquisition is more than twice as advantageous to you, and indeed more than twice as necessary for you as for him, so that your double trouble and double time have been well bestowed.

It is a mistake, if you have the opportunity of choosing what work you will do,—an opportunity which to some extent a pupil often enjoys, though an assistant seldom,—to stick too close to one thing. As far as possible, try to get a share in each sort of work that is in the office, and if it is work that you are not used to, and find difficult to perform, so much the more instructive is it likely to prove. It is also a mistake to shirk the work you do not fancy. A young friend of mine complained to me once that he was given a good many letters to write when he thought he ought to be drawing. I pointed out to him that when he was in practice he would have shoals of letters to write, and that the art of writing a good business letter does not come of itself,—far from it; so that he ought not to object to have the opportunity given him of practising his hand upon what is as necessary a piece of attainment as draughtsmanship.

It is a mistake to take up too much that is outside your profession. Every young man ought to have some athletic pursuit,—cricket, tennis, cycling, walking, riding, boating, swimming. But it is distracting to take up or keep up too many such pursuits, or give too much time to those you select. Similarly, some hobby or pursuit that is not exactly architectural, such as a certain amount of reading and a certain amount of society, are good, and in moderation desirable. But learning a profession is an arduous task, and the men who will succeed best are those who give up their evenings night after night to pursuits akin to architecture, such as a school of art, the Architectural Association classes and meetings, or working up privately book after book on construction, materials, &c., or practising design, or drawing, or working at the joiner's bench. You will find in many other professions the demands made upon the time

and attention of students leave them for years little leisure for any outside pursuit whatever; and I do not think architecture requires less thorough devotion of time and power than does medicine, or law, or commerce, or that there is less to learn in architecture than those other professions.

It is a mistake not to sketch. Going and looking at architectural buildings is just a little better than not seeing them, but not of much permanent service. Photographs, whether you buy them, or what is worse (because it takes so much time up), make them, are almost worthless as substitutes for the results of your own sketching and measuring. What you draw you look at,—you, to some extent, understand, and you generally remember, while the drawing will always remind you of what you saw and tried to fix on your paper. Some young men are disposed when they get a summer holiday to boat or bathe, or ramble about, as if their daily occupations as architects were of no more interest to them than those of a linendraper, and ought to be forgotten instead of being fostered at holiday times. Holidays are the best opportunities of architectural study possible, and, let me add, as soon as the first difficulty of sketching architecture from buildings is got over, sketching tours are the most enjoyable holidays possible. More can be learned in a fortnight's well-directed sketching than in months of work over books and drawings, and I will engage to say that the architectural traveller gets twice as much enjoyment out of any trip which takes him to cities and towns of interest as any of the ordinary travellers he will fall in with on his route.

It is a mistake to sketch or to study alone, if it can be avoided. *Nosolus a sociis*, which, being freely Englished, is "Birds of a feather flock together"; and, though a man's books and drawings are not bad companions, human comrades and friends are more useful, if only they be of the right sort. The best comrade for a beginner is one who is more advanced than himself, and, fortunately, the tyro, if teachable, is far from being the worst companion for the advanced student. Habits, circumstances, and opportunities of course differ, and under certain conditions a man must study alone; but much time is often lost, and mistakes are apt to be made by those who work alone, and especially if they work without guidance. The opportunities of getting good instruction, and of associating with other students, are fortunately on the increase, and are so well known that I need not recapitulate them here; but I will add that studying together in this class-room has been, as I have reason to know, a beginning of student friendships, some of which have lasted through life.

On the choice of subjects of study I have not much to point out, but I cannot forbear saying that it is a mistake to despise surveying. Many students consider that they ought to prepare themselves for purely architectural practice, and for that only, and that everything which can go by the name of surveying is unnecessary, if not beneath them. They believe surveying to be, at any rate, a little wide of their line, and that it is to be accordingly shunned; but when they come to practice they will find that a certain amount of surveying work will come in their way, and must either be done or handed over to better-prepared persons. I am not now speaking of quantities, the preparation of which is, to a large extent, a distinct work; but of all that relates to the examination and care of existing buildings. If you reflect that in any city or town for one new building there are hundreds already in existence, and that each of these hundreds is likely to be repeatedly surveyed, now for repair, now for alteration or enlargement, now for sale, or purchase, or rating, and possibly again after injury by fire, you will see that the mass of surveying work in the aggregate is considerable. Much of this can be better done by an architect than by any other person, and from time to time every architect is asked to make surveys under circumstances which make it clear that if he cannot or will not, valuable connexions will go elsewhere. Nor is this all. Architectural practice is always fluctuating, and not infrequently the question of surveying work or none is a question of bread-and-butter or none. So do not consider that surveys are nuisances or interruptions, but pick up what you can about them, and, if a chance offers, by all means try to see a little land-surveying. A very few days in the field will make the methods of working clear to any one who has not forgotten his trigonometry.

There is a companion mistake, one, I mean, of an opposite character, which is sometimes made, and which may as well be noticed. It is the mistake of neglecting design. Designing is the highest part of an architect's work, and it is work that he must be able to do. I am quite aware that it is no use for a beginner to try to design. He has no materials yet, and it would probably be more likely to do him harm than good if he attempted to originate out of the emptiness of his knowledge something that should represent a building. But designing does not come of itself, and yet many students go on for years accumulating knowledge and experience, and make no attempt to exercise themselves in design. Whenever one has made a piece of architecture one's own by studying, sketching, and measuring it, it is a wise course to try to design a variation upon it, making use of the same features, details, and ornaments, but rearranging them. This may be done if you like upon a single feature and an extremely small subject, and from such beginnings there are many ways of going on. What I wish to urge here is that it is a mistake not to begin.

The last mistake with regard to study that I feel bound to name is the mistake of not going on the Continent. This is, perhaps, not so prevalent as it was in the height of the Gothic revival time, when many good students believed that if they could thoroughly master English Gothic they need not attempt more. Now that Renaissance of some sort is being more generally practised, more men go to Italy and Greece, but still the number is small in comparison with the number of pupils and students. This, I repeat, is a great mistake, and if you say that it is a serious expense and absorbs much time—which are the two things that can be said against a continental tour—the answer is, that as to time it cannot be better spent, and as to money, there are few liberal professions where some expense is not absolutely necessary at some time, while the scholarships and studentships obtainable give to a few students in each year substantial assistance. Certain it is that this period of continuous study in other countries, and under other suns, seems more than anything else to make the difference between the mere draughtsman and the accomplished architect.

#### Examination Mistakes.

Every professional student has now to look forward, more or less, to examinations. There are many callings in which these have been pushed too far; happily that is not the case, at any rate as yet, with architecture. We have, however, enough examinations and competitions for prizes to bring mistakes in examinations well within our scope this evening. The prime mistake is to go up unprepared, in the hope that one may succeed by a fluke; or, perhaps, in the mistaken belief that one knows the subject so well that no preparation is needed. I have had a rather long and rather wide experience as an examiner in architecture, and I can assure you that the degree of unpreparedness with which some candidates are content is perfectly astonishing. Perhaps a specimen of the worst papers I ever had to correct might be more amusing than impressive; but I am sure that many students of schools of art offer themselves for examination simply on the chance that by a fluke they may get through, and have signally and dismally failed accordingly.

In the case of the Institute Examination for the Associateship, or that for the District Surveyorship certificate, long and careful preparation is needed, and for each of these a spice of practical training is wanted. The would-be Associate must have some practice in design, and must make himself personally familiar with some specimens of ancient architecture, and the would-be district surveyor must have some experience of the supervision of building works. Similarly, where drawings have to be made with a view to prizes offered by the Institute or the Association, a candidate, in order to have any chance, and to gain any good from entering on the competition, ought to have some experience of drawing, and, if the prize be for a design, some notion of designing before he ventures to compete; though, as these are competitions and not pass examinations, failure to succeed does not involve the same discredit, and ought not to have the same discouraging effect on the candidate as failure in a pass examination.

It is a mistake, let me very emphatically say, for any student attending the courses about to begin here to avoid the final examination or any intermediate examination. Of course, the prizes are only few, and, as far as they are con-



cerned, the examination at the end of the session is competitive; but the certificates are given to as many as get more than a certain proportion of marks without limit of number, and so there is for each one a chance of having his ability and diligence recognised, and the opportunity which the class examinations offer of proving to yourselves that you have learned and retained a fair amount of what I try to teach is, in my opinion, of great value.

In the examination-room it is a great mistake to fire off a piece of knowledge that has nothing to do with the question, simply because you know it. As, for example, suppose you have carefully got up the tracery of windows of different periods of English art, and no question is asked about tracery, but a question is asked about mouldings. If in answering that question you drag in the tracery and spend half-an-hour over it, you do more harm than good. No examiner who knows his work will give a single mark for statements that are irrelevant and do not answer any part of the question, so you get no marks for your tracery; meantime, the writing and sketches have wasted you half-an-hour, during which time, had you been answering other questions to the best of your ability, you would have been earning marks.

Next to the mistake of lugging in irrelevant matter by the head and shoulders comes the mistake of giving too much time to one or two questions. A paper in which there is no portion among the answers is one very difficult to mark, but which, from the very nature of things, is sure not to get so many marks as one containing the same amount of writing and sketches, but where more questions are taken, and a clear, condensed, yet correct answer given to each. It is a mistake, also, in architectural examinations not to illustrate the paper of answers by sketches whenever possible. If, unluckily, you cannot make tolerable sketches, it is very much to be regretted, and you had better stick to written replies; but if you have any reasonable mastery of the pencil, do not forget to introduce sketches, and the better they are, the better your paper, and the higher will it be marked. It is a mistake—and one often made, I fear,—to suppose that examiners in our professional examinations are anxious to trip you up, and that they lie at the catch and will be heartily glad if, by some clever and misleading device, they unfairly entrap you into a blunder. The object of the examiners is to bring out what you know and what you do not know, and it is with an anxious sense of serious responsibility that they carry on this important work. Rely upon it they had rather be convinced that you are fit to pass than that you must be turned back. But rely, also, upon it that they will not pass you till they are so convinced.

Again, it is a mistake to suppose that any answer which is not wrong will do. If a question involves a difficulty, the answer which evades that difficulty is very differently considered from that which attempts it, even if it should fail to solve it perfectly. For example, in a recent examination I gave the dimensions of a bay of flooring fit to carry a certain weight per foot, and required an iron girder to be calculated of a fixed span and strong enough to carry that bay. I got more than one reply in which the calculation was attempted, and was carried out on the right method; but the right result did not come out, owing to errors or omissions in calculating. I got one reply, in which, after stating the number of tons to be carried, the answer went on saying, "I should adopt a rolled iron joist, so many lbs. to the foot." This answer was probably arrived at by some rule-of-thumb method; it was not far from being practically correct, but there was no attempt made to work out the calculation, which was the difficult part of the question, and, of course, I could not give such good marks to this reply, which avoided the difficulties, as to those in which the students had tackled them to the best of their ability and by proper methods.

#### Architects' Mistakes.

We have now reached architects' mistakes, and there seems to be good reason for occupying such time as is left chiefly with mistakes in practice. Still, there are one or two remarks on design which I am tempted to hazard, and which I think can usefully be made. Remember, then, that it is a great mistake to attempt to use in designing what you do not understand. Just as in Egypt the captive Israelites could not make bricks without straw, so you cannot design without materials,—i.e.,

without being familiar with the forms, features, and ornaments of the style in which you are working, and with the manner in which those elements have been put together by successful architects before your time; and without, moreover, being practised in the application of that knowledge.

If you want to see examples on a large scale, numerous, costly, and distressingly instructive of what making architectural bricks without this sort of straw comes to, just walk through the various streets and courts of the City of London. Side by side with some of the best buildings of our best architects you will see costly works, substantial and pretentious, designed by men who can have had no intimate knowledge of, and scarcely any training in, our art, and who have in most cases been employed because they were known to moneyed men as trustworthy surveyors. Such have doubtless built soundly, but their works are architecturally failures. Getting together this straw—to return to the old figure—is no easy task. It takes a long time and a good deal of pains to gather information enough, and to develop skill and experience enough, to make a really good architectural design, and to work it out in all its details; yet it is unwise to start practice till this can be done. Sometimes circumstances or the offer of work render it almost necessary for a student of only a few years' standing to begin on his own account; but it is very rare for those who start prematurely to succeed in doing good architecture, unless they have the resolution, after completing their first works, to stop, and go abroad and finish their studies, and then come home and resume.

I am tempted to add that a new style is a mistake; not that a new style is in itself impossible, but that it is impossible to you or me. It is idle to suppose that the genius of any one man could successfully work out a new style which his fellow-men would feel to be appropriate. Looking round on the motley variety of styles which prevail in modern Europe, we are tempted to believe that it is a matter of no moment what style be brought in and used. Yet a little observation will show you that it is not so. No architectural style is practised in England (to limit our notice to the country under our eyes), various as the styles that are on hand, in vogue may be, unless its roots are deep and wide in the history or the sympathies of the English people. Greek, which was the style of our grandfathers' time, was welcomed at a time when every man of education in England was, or wished to be thought, a classical scholar. Scholarship is on the wane, and there is now scant encouragement for the practice of Greek architecture, though to learn it is as useful as ever. Italian Renaissance is intimately connected with modern as distinct from Medieval feeling and life, and has become universal in this as in other countries of Europe, just because it is identified with that which England has in common with every modern European country. Gothic is the architecture which was a native of this country during the whole of the Middle Ages. Queen Anne is Dutch architecture, and belongs to a set of things which became incorporated in our national life at the Revolution, when Holland gave us a king. There have been, on the other hand, various attempts to introduce other styles with which there exist no such links, but the attempts have failed. For example, no permanent result followed the efforts of that most able architect Owen Jones to introduce Mahomedan architecture into this country,—efforts in which he was virtually without followers. If there is any truth in these views, and I believe there is no gainsaying them, we have no reasonable ground for supposing that a new style could live and thrive, even if a great man had the genius to devise such a thing. If it comes it will grow, not be made.

Every apparent novelty in architecture should be viewed with great distrust as more likely to be a mistake than a success. That novelty is both possible and desirable is self-evident, but beware of what seems to you to promise to be extremely and strikingly novel. It has, probably, been tried before, and given up as less good than the received way, or, if that be not the case, still there is great risk of its being the bluish instead of the blossom of your work—a mistake instead of a discovery. The one defect of importance in St. Paul's Cathedral occurs at the crossing of the main avenue and the transepts—the one part where its great architect has departed most widely from the practice of other church-builders, and has, in the search

for novelty, sacrificed more than he has gained, clever though the disposition of the piers that carry his dome undoubtedly is.

#### Mistakes in Practice.

In practice—that is to say, in the practically carrying on of the profession of architect,—no more grievous mistake can be made,—nay, think, none so grievous,—as taking bribes. An architect who accepts illicit commissions, or does nominal work for large fees, or who allows any other of the expedients by which receiving a bribe is made to look as if it were a business transaction, to be practised upon him, has sinned against the very first duty of a professional man; he has sold that independence which ought to be his most-cherished possession, and has put himself under the thumb of the very persons whom he ought to control. The wisest of mankind says, "A gift destroyeth the heart," and it is not possible to be more forcible, more terse, or more true. There are sure to be times when very specious proposals will be made to most of you, and when it may appear almost Quixotic to decline money which you sorely need; but whenever any case occurs in which you honestly doubt whether the transaction is one for you to agree to or not, I will suggest a practical test. Imagine yourself cross-questioned as to the entire affair by some such master of the art as Sir Henry James, before Mr. Justice Hawkins and a jury, in open court, and if you at all doubt whether you could not only come off with credit, but pray take that as an indication that the doubt is well founded, and the proposed transaction should be declined with thanks.

Anything that is in any way unfair is a mistake as well as reprehensible. It is wrong; it is also bad policy. Believe me there is no truer word than that "Honesty is the best policy." It is both dishonest and a mistake to get work away from a professional brother, or to undersell the profession by working at a rate below the recognised and fair rate, and it is equally a mistake to overcharge a client. Either of these may be expected to bring an inevitable train of bad consequences, a retribution, in its wake. It is, generally speaking, a mistake to work for nothing. You may occasionally do it in the case of charities in which you are interested, but I think a guiding rule should be not to do it in any case except where the work is so in your own opinion that under any circumstances it would come to you. To do work for nothing, and thereby deprive some other architect both of the work and the fees, is extremely bad.

I think there remains no worse mistake to note than temper. Temper is a mistake, a ship without a rudder, a horse without a rider, or a stream that has burst its banks, are apt illustrations of the condition of a man of business who has lost his temper. Above all things, an angry letter is a mistake. Make it a rule never to write a line while you are angry; for, somehow, an angry man's pen seems dipped in permanent gall rather than ink, and his written words unlookingly have not the same chance of being either promptly answered, and then forgotten, or good-naturedly overlooked, that hastily spoken words often have. A letter written in heat is read, you must remember, in cool blood. If something raises your wrath, and you sit down and fire off a withering epistle, the best thing you can do is to put it in the fire there and then, the next best, to keep it twenty-four hours and then reconsider it; and the next best, to show it to a judicious friend.

One in high station, who had been much irritated, and had written a splendid and stinging reply, took it to the most influential man whom he knew. The chief—I think it was Palmerston—read it right through without a word. "Got a copy of this letter?" "No." "Not even a rough draft?" "No. I wrote it straight off." "Very injudicious letter. Much better burn it"—and, suiting the action to the word, the great man put it into the fire, and coolly held it there with the poker till there was no shred left. That was the action of a true friend.

I must, at the same time, point out that just anger is not the same thing as giving way to temper. The ability to exhibit indignation at the right moment, if kept perfectly under control, is very useful to one who has to supervise works or direct men. The just anger of a superior is generally dreaded, and to an extent far beyond what one would expect or can quite explain. If, therefore, you are able at the proper moment to show an offending artisan, foreman, contractor, or tradesman, that you are justly and with good reason roused,



anger, it will generally help you in the control of the works under your direction.

My reference to an angry letter as a mistake makes it suitable here to add that we are liable to make mistakes by writing where we ought to speak, and speaking where we ought to write. Writing is quite permanent; therefore it is far safer than our fading memories to record nothing that should last. It is quite inelastic, quite unyielding; so it is unfit for anything of the nature of give-and-take. In all negotiations, explanations—above all, whenever there is a difficulty or ground for dissatisfaction,—see people, at all sacrifices, in preference to writing them. At such times it is a mistake to write. In the other hand, if any specific order has to be given, if any definite objection or complaint is to be made, or if any agreement has to remain in force for any length of time, it is equally a mistake not to put it in writing. Your order, your complaint, your contract may often be originally done by word of mouth; but, in such cases, they should be afterwards repeated in writing, for accuracy's sake.

In architectural practice delay is a mistake. It is not always possible to be prompt, but it is more possible than persons who habitually procrastinate are willing to believe, and from start to last it will greatly add to your chance of success if you are prompt. At the first inception of an undertaking, whether the client be eager or the reverse, it is equally prudent to do something at once. The eager client is balked if he find nothing done after a short time,—perhaps changes his mind as to doing the work at all, or more possibly changes his architect. The lukewarm and indifferent client, who might by a promptly-prepared sketch have been encouraged to go on, is disheartened, or turns to something else, or postpones or abandons his intention. Were I to trace the work of an architect all through, it would be easy to show that at every succeeding stage delay is a mistake, though I am bound to admit that it often can hardly be avoided.

Carelessness is another mistake, and one into which not a few men are apt to fall. The saying is attributed to Goethe, that "Genius is the art of taking pains." The common notion of genius is that it can do without taking pains. I do not ask you to accept his definition of genius as exact, but it covers half, and more than half, of the truth, and it would, I think, be perfectly true if you altered the wording and said, "The secret of success is the art of taking pains." Watch a successful man in the exercise of his art or pursuit, whatever it may be; you will see him all attention, all devotion to the business in hand. Consult an eminent physician, and you see by his questions, his air of concentration, his whole method, that for the time being your constitution, your ailment, and what to do for you in order to relieve you, occupy his entire and undivided attention and thoughts. It is chiefly this habit and power of concentration which has made his pursuit of medicine successful, has enabled him often to baffle disease and restore health, and has gained him reputation.

Read any good life of any prominent public man—as, for example, read Mr. Street's life lately published), and you will see what incessant, eager toil and watchfulness occupied every hour of his day, and his night too. Nor is it less easy to remark in recreations that success can only be secured by great pains, however clever you may naturally be. Watch an angler who is known to be habitually successful, his keen attention, his constant thoughtfulness about tackle, flies, water, the long hours he will devote to fishing, and the eager pursuit of his game. A champion player in any athletic game, rowing, cricket, tennis, football, rifle-shooting—what constant practice! what a watchful eye for every turn of the game, every detail of the pursuit! Now if you are to be successful in architectural practice, you must set about it in the spirit, temper, and method of Grace at his cricket, or Renshaw at his tennis, or a Queen's prizeman at his rifle-range.

It is, however, possible to throw one's self into the interesting part of a pursuit, and to remain indifferent to details that do not of themselves attract or that seem insignificant. This, though of course better than being languid and careless about the whole business, is likely to lead to trouble. In the conduct of works, then, it is a mistake to neglect small matters, though it is equally a mistake to fuss. In every building there occur a certain number of apparently little points which must receive the architect's careful at-

tention, but which one is naturally more inclined to leave to others or to chance than the questions that affect large parts of the fabric. The difference between the important and the unimportant does not, however, lie in their magnitude, or their cost, or their conspicuousness. The main walls are a costly part of the building, but they may be considerably damaged, decayed, or mutilated without a tithe of the inconvenience to the inmates which will occur if their chimneys smoke, their taps yield nothing but lukewarm water, their ovens will not heat, or the water runs off from their cisterns. The same thing is often true of the artistic effect of your work. You have, let us say, a Gothic church in hand, and labels over the windows springing from carved bosses. You carelessly place the bosses below the springing line instead of above it, or you in ignorance draw them so. That small blunder produces exactly the effects on the eye of a cultivated observer that would result to his ear from your talking about *harc* or *harcitecture*, and, in its way, the proper placing of that one detail is as essential to the success of the design as the most ambitious or elaborate of its features. It is therefore a mistake to consider that any single thing essential to your building is unimportant or may be safely neglected.

There is, however, an opposite; fussiness is a mistake. It is fussiness to visit a building too constantly, or to interfere for the sake of interfering. You must not forget that if, as architect, you have the power of making alterations, every alteration, even if it be an improvement, means delay and expense, and that delay and expense are among the worst evils that can afflict a building. One of the most troublesome and unsatisfactory disagreements I ever had to unravel grew out of the architect, a man of real ability, having little other work in hand, paying a visit at least every other day to the works, and never going without ordering something to be done or undone. The accumulated effect of these orders was months of delay and claims without end for extras, while for all practical purposes the building would have been quite as serviceable if carried out exactly as shown in the original plans and specifications, without any of the modifications and improvements.

I am quite aware that one cannot expect people's minds to cease working when once a contract has been signed, and that it is proverbially "never too late to mend"; but, on the other hand, "you may buy even gold too dear." A rolling-stone gathers no moss, and there are few improvements which are really worth the cost, delay, and annoyance that come of interfering with a contract which has once been settled and accepted. In short, generally speaking, variations are a mistake.

Mistakes in dealing with your clients are especially to be guarded against, because they generally injure your prospects in life, yet they may occur in so many different ways that it is impossible to catalogue them. Many, if not most, instances of miscarriage between clients and their architects appear, however, to start from one root, namely, from mistaking the duty you have to discharge, or forgetting to keep up the proper relation of architect and client. Your duty may be described thus: to form a correct idea of what your client wants and wishes, and to do your best to obtain it for him. Your relation to him is purely professional, and not that of friendly intimacy, or equality, or good fellowship, or boon companionship. There are cases where an architect forms an idea of what a client wants, but one which does not correspond to his wishes, and then there is sure to be dissatisfaction. There are cases where an architect forms a notion of what a client wishes, but fails, till too late, to realise that it is not what he wants. The result again is dissatisfaction. There are cases in which the architect troubles himself little about either the wants or the wishes of his client, and works out what in his judgment they ought to be. Same result. Lastly, it has sometimes happened that the architect and the client, or one of them, have forgotten to maintain their intercourse on the proper professional footing, and if any case of disagreement arises these cases end in the bitterness of quarrels. Professor Cockerell,—a prince of architects,—used to say to us, "Be a gentleman among artists and an artist among gentlemen."

As one illustration of, perhaps, the most common form in which this sort of misunderstanding of the architect's duties develops itself, I will take the case of a dwelling-house. The architect busies himself to learn what his client's wishes are, and he takes no small pains

to put them into shape, and he, perhaps, designs something which is very near to what his client would like. But he neglects to realise exactly what his client wants. Let us suppose that his client is a man of moderate means, who cannot trench upon his income, and who has, let us say, 2,000*l.* to spend, and that what he really needs is the best house that can be had for a couple of thousand pounds, all which his architect might have found out had he taken the trouble. When the lowest estimate for the design comes in at over four thousand, the whole thing is abandoned in chagrin and disgust, and the architect too late realises that he ought to have found out what his client needed as well as what he wished.

The relationship between client and architect involves the necessity sometimes of very plain speaking, and the more thoroughly professional the bearing of the architect has been, the more thoroughly it is possible for him to discharge this sometimes painful duty with perfect effect. For example, in the case I have suggested, had the architect quite realised the case, he would at some period have had to say, "You cannot within the limit of expense that is prudent build anything either so ornamental and so roomy as you want; the design must be plain, some rooms given up, and the others kept small," and so on. Whenever any such necessity arises, believe me, it is a mistake to shrink or postpone the unpleasant duty. Meet it squarely and fairly and with good temper.

In dealing with those employed on your works, it is a mistake to suppose that every contractor, tradesman, or artificer is a thief or an extortioner, and every quantity surveyor a kind of contraband agent. I have put it strongly, but the suspicious temper of mind at which this remark points goes sometimes far towards a tone of feeling as exaggerated as this. The fact is, that your contractors and tradesmen are engaged in one of the most complicated and difficult businesses possible. Their motive for carrying on the business is to make a profit, and you should look upon it as a matter for sincere regret if a profit is not made by the contractors on your works. You and they are engaged together on the difficult task of erecting a building, and if originally you know them to be respectable, by all means treat these people as co-operating with you, and aiding to give reality to your designs, which is their real position, and do not suspect unfair dealing till some proof of it begins to show itself. Such a course will be much nearer the fair and proper mode of administering a building. While I recommend this tone of mind I do not recommend that you should cease to be vigilant and careful. It would be quite as great a mistake to abandon watchfulness as to abandon confidence gratuitously, and it would be a departure from the line of conduct which your duty to your client prescribes to you. It is, perhaps, hardly necessary now to say anything about quantity surveyors, but I know that when I began practice, there was a kind of uneasy feeling in the minds of some of us, as though quantities were a kind of illicit trading, and those who prepared them akin to smugglers. If any of you share these notions now, permit me to assure you that they are a mistake, that the profession of a quantity surveyor is a most honourable and confidential one, and that the work they do is now indispensable to the conduct of building operations of any magnitude or complexity, and the assistance they render to the architect very valuable.

This mention of contractors and surveyors will serve to introduce another subject that should be noticed. It is for a beginner a mistake to employ second-rate or unknown men, either as builders, manufacturers, or quantity surveyors. When you have established your position and gained a reasonable amount of reputation and experience, do as you like, but in early days you cannot afford to employ people who are not first-rate. It is of vital importance to run no risk of failure in your early works, and the employment of thoroughly reliable persons will greatly diminish that risk, and their known position and trustworthiness are a great safeguard and help to you if any part of their work should go wrong; and to some extent the same caution is a prudent one as regards new materials and untried modes of construction. A fortunate accident on the very first matter of any importance ever put into my hands revealed to me the value of employing known men. The work came from a man of business in the country, and I was, I know, looked upon with distrust by his London agent,



who saw me for him, as young and untried. Fortunately, after making out some drawings and a specification, I got an estimate from a contractor of good repute, and I well remember how, when I went with the whole to my new client's agent, his face brightened up when he saw the signature of a man whom he knew well as competent and trustworthy, and by whom, ultimately, by and by, the work was excellently done. I urge this the more because young men often are more exposed to the temptation to get their work done in the very cheapest way than they will be in after life.

It appears to me to be as much a mistake for a practitioner of architecture to isolate himself as I earlier pointed out it is for a student. If there be no suitable associates within reach it cannot be helped; but in nine cases out of ten there are brother professional men available. Just as you, gentlemen, as students, can learn a great deal from one another, and will lose much of the stimulus and encouragement which make work go well if you do not in some way work in company, so in after life also you will derive great benefit and great pleasure from the society of those who are working at the same profession as yourselves, pursuing the same aims, encountering the same difficulties, delighting in the same studies; and you will be able to render assistance to your professional friends as well as to receive it from them. There are many circumstances under which two architects have to meet as representatives of two clients differently affected by some building operation. You can hardly imagine till you have had experience of it how much better all this class of business is got through if the two professional men know one another; or if even they only know each other as members of the Institute or of the Architectural Association, or in some such relation, than if they meet as absolute strangers. There are also many circumstances in which it is of inestimable importance to an architect to be favourably known to the members of his profession, and I strongly urge you all to begin in this classroom and the Association and Royal Academy schools to work together, and in after-life to belong to the Institute, and not only to belong to these societies, but give some attention and time to their work. An architectural hermit is a mistake.

It is not necessary, I hope, for me to offer proofs that most of the mistakes named deserve the name. I think your own good sense will have recognised, as we went through them, that they merit, each of them, a place in the list of things to be avoided. Some of these mistakes I have myself made, and have found to my own cost that they are what I have described them to be. Others I have happily escaped, but I have seen them made, and know that their consequences are not good.

To steer clear of every error is impossible, but what I wish to say is that good sense, right feeling, and thoughtful attention to your work will go far to preserve you from any very serious slips. Years ago a pupil of mine acted as clerk of works on a job of mine where there was a great deal of masonry, and something which he told me about that masonry seems to convey a lesson. He noticed that some of the masons, as soon as they got a block of stone out of which to cut a feature of the building, set to with mallet and chisel, and in ten minutes were hard at it. Others would spend an hour or two, or possibly a whole morning, studying the block of stone on every side, considering exactly how best it could be utilised, and, in short, laying out their work before they put their hands to it. The men who made mistakes in their work were masons of the first group, not of the second. Perhaps this observation may suggest to us a method by which we may avoid mistakes in our work.

**Mildmay Tomb.**—Owing to a misapprehension (the original signed drawing having been returned to the author), this illustration last week was not credited to its real author, who is Mr. E. A. Bartlett, of Chelmsford, not Mr. Downing. We much regret (as does Mr. Downing) that Mr. Bartlett should have been for the space of a week deprived of the credit of his own work.

**Removal.**—We are asked to mention that Messrs. F. L. May & Co.'s Newspaper Advertisement Offices have been removed from 169, Piccadilly, to 162, Piccadilly (corner of St. James's-street.)

## Illustrations.

### THE NEW CHURCH OF THE HOLY TRINITY, UPPER CHELSEA.

**T**HE new church of the Holy Trinity, which we illustrate this week, is to be built at the sole cost of Earl Cadogan, who also gives the site. The special features of the structure are the unusual width of the nave, which is 40 ft. wide, the large windows at the east and west ends, and the wood vaulting. The plan shows a nave and chancel 150 ft. long, carried under one span of roof from end to end, north and south aisles, with a morning chapel on the north side. There are vestries for clergy and choir at the east end of the north aisle, and provision is made for an ambulatory round the eastern part of the church.

The church is of six bays of arches on either side, standing on octagonal piers. The inner sides of the octagons are carried through into the wall-arch of the vaulting, while lower arches rise out of the other sides of the piers. Immediately above these arches is a broad frieze of wall surface, which is meant to receive painted or mosaic decoration. The spandrels of the nave arcades show figures of the prophets carved out of brick. The walls generally are built of brick, with bands of stone and stone dressings. The organ will be on the south side of the choir, and small galleries are provided in the sanctuary to accommodate a band. On the north side of the chancel is a chapel to be used for weekday services, divided into three bays by arches running across the chapel.

The west facade of the church shows an open porch to the north and south aisles and to the nave, which are separated from each other by octagonal turrets, surmounted with open traceried spaces for bells. The porches and the upper part of the walls of the aisles and the west end of the nave are crowned with open traceried battlements with carved angels, and the main entrances are flanked with life-sized figures of apostles carved in stone.

Both the drawings were exhibited in the Royal Academy, and we commented, in our notice of the Royal Academy architectural drawings, on the striking and original characteristics of the design, both externally and internally. The architect is Mr. J. D. Sedding.

### OAK ROOM, NEW RIVER COMPANY'S PREMISES.

THIS room, of which we give a view in the present number, is the room in the New River Company's offices which is used for the meetings of the proprietors. The house in which it is situated was built in 1613, and repaired and re-fronted in 1782. The carving in the room is attributed to Grinling Gibbons.

The illustration is reproduced from a water-colour drawing by Mr. John Crowther, which was in the Architectural Room at the last Royal Academy Exhibition.

### AN HOUR IN A VILLAGE CHURCH.

ON the edge of the once far-spreading forest of Rockingham, and just where the flat table-land, which hereabouts it occupies, begins to descend abruptly to the broad valley through which the Welland finds its devious and divided way, stands a village full of old houses, all substantially built of the excellent stone of the district, and witnessing to a period of great prosperity throughout the seventeenth century. Now, however, not a few are rent with ominous cracks; here and there the bare roof-timbers of an extensive barn protrude through the thatch, or outline themselves in melancholy fashion against the sky, and give an air of neglect and decay to the place curiously at variance with the neat and comfortable look of the majority of the houses.

This mixture of prosperity and adversity is equally observable in the church. It is un-restored, and its history lies written in a fragmentary way on every side.

It cannot be denied that through some fatality or other, indifferent and even unskilful workmen have always been employed on the fabric since its foundation over seven hundred years ago, unless we except those who reared the beautiful tower in the fifteenth century. Look, for instance, at the round Norman arches of the nave and the massive pillars on which they rest. The arches themselves may pass muster, but the

pillars are all awry and the capitals must have been the work of a prattling hand sent down to learn his business in this wild forest settlement. A century after this youth had removed himself to another sphere of labour, the church was considerably enlarged. There were aisles before, but they were remodelled. The church lengthened eastwards, and transepts were added; but still unskilful masons were employed. Across each aisle from their tip-sept wall to the new length of wall which they added to the nave, they threw an arch,—not an arch, but half an arch,—with a crown resting on the nave wall, for their settlement was such that no pillar was in a position to receive it, and therefore they simply leaned against the wall. The consequence has been that the weight of these half arches, or flying arches, has thrust against the nave walls their great detriment, and to the peril of the whole structure.

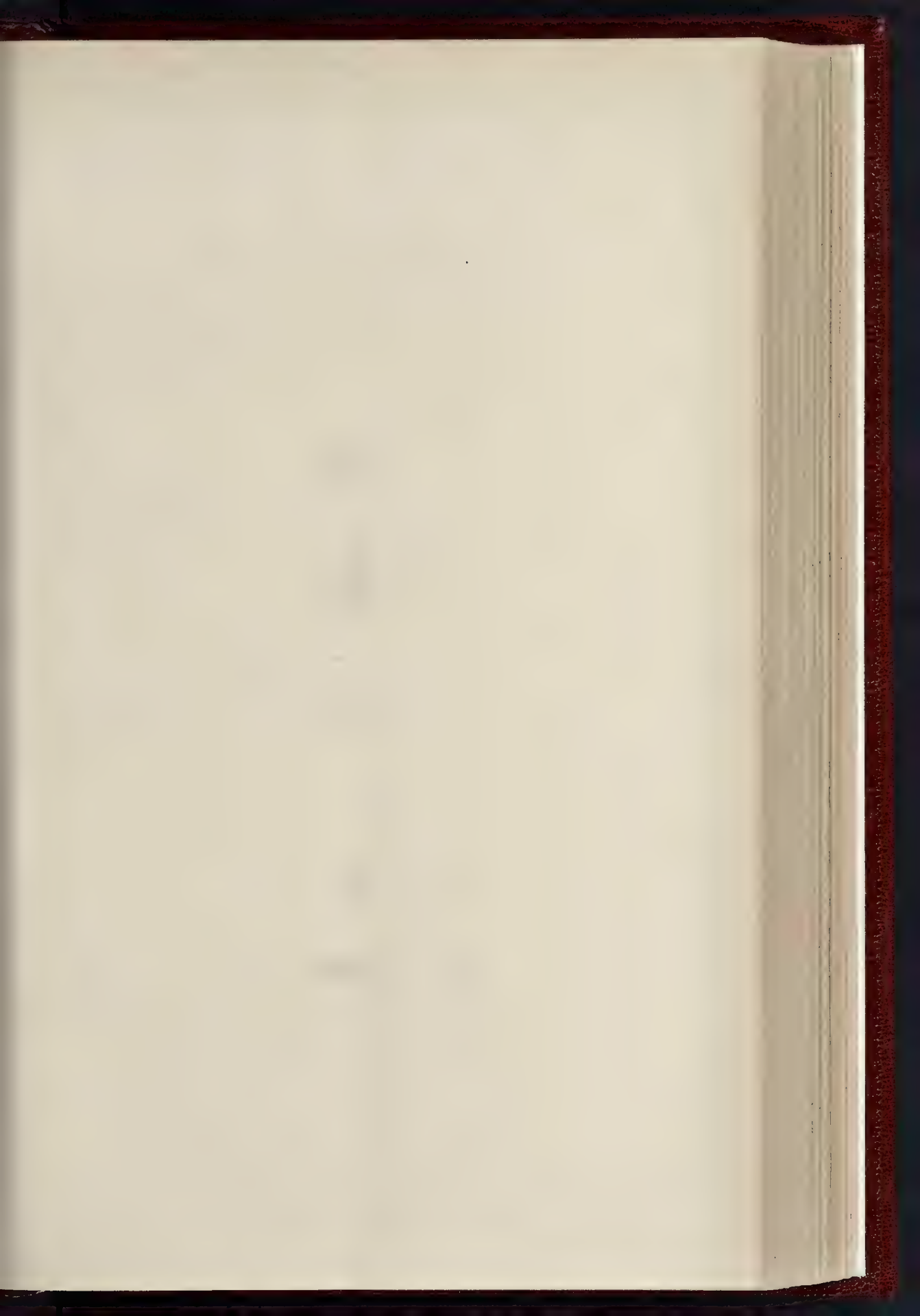
Such was the constructive skill of the thirteenth-century masons; as designers, they were little better. True it is that each individual feature of their work is pleasant enough. The piscina, or whatever it may have been, in the south transept, is nice enough, and the mouldings are bold and simple; so are those of the mysterious recesses in the north-west corner of the same transept. Their swelling outlines, their deep under-cutting, and the vigorous of tooth with which they are emphasized, are very fascinating. But the arches of the recesses meet in a fashion most clumsy; they have no consideration for the sill of the adjacent contemporary window; straggle about without reason, or thrust themselves rudely against more delicate work; and everything points to a state of art where a clever workman could turn out excellent specimens of things to which he was accustomed, but had no faculty for combining the separate features into harmonious whole.

Another century passed away, and again workmen were employed, and once again severe test of time has been unfavourable to them. On this occasion their work was confined to making the interior more cheerful by inserting larger windows in various places, and in adding a clearstory to the nave. The south aisle are mutilated remains of a window of two lights; in the gable of the south transept are the jambs and mullions of a four-light window, of which the mouldings resemble those in the excellent east window of the chancel. The fatality which attended the work hitherto has not spared this window, for the masonry at each side has given way, and the head, filled with beautiful carved tracery, has sunk, and besides breaking the back of its enclosing arch, has thrust the jambs, so that the window at the spring line of the arch is many inches wider than it is at the sill-level; thus giving an appearance of instability and decay to one of the most notable features of the church.

Yet another hundred years went by, and then about the middle of the fifteenth century workmen once more came to the place, to time to build the tower. Their work has survived, and contrasts favourably, both in design and execution, with any that preceded it. Indeed, to all but the curious and careless observer, the tower is the only noteworthy feature of the building. The mixture of arches of varying shapes and heights, the bowing walls, the distorted windows, and the general air of slovenly workmanship, marks the interior, rouse but little interest, until one comes to try and read the history of the many changes that have occurred. But the tower is a good piece of work that quiet kind which grows upon one by acquaintance. It has no pretensions to elaboration or expensive work. It consists of a brown walling, divided at judicious intervals by grey strings. The battresses which emphasise the corners are weathered back in grey stone, just the right distances, till they end in delicate panelling beneath the four pinnacles at the top. A small, single-light window shows itself in two faces in one of the lower stages. Above them all is plain ashlar work till the most stage, which is occupied on each side with the belfry windows. There is nothing intricate, no *tour de force*, nothing difficult to draw; but, as an instance of the value of great masses of wall, this tower well deserves attention, as it rises from among its trees straight and shining in the sunlight almost as an Italian campanile.

So far each century since the foundation of the church had seen some enlargement





THE BUILDER, OCTOBER 6, 1888.





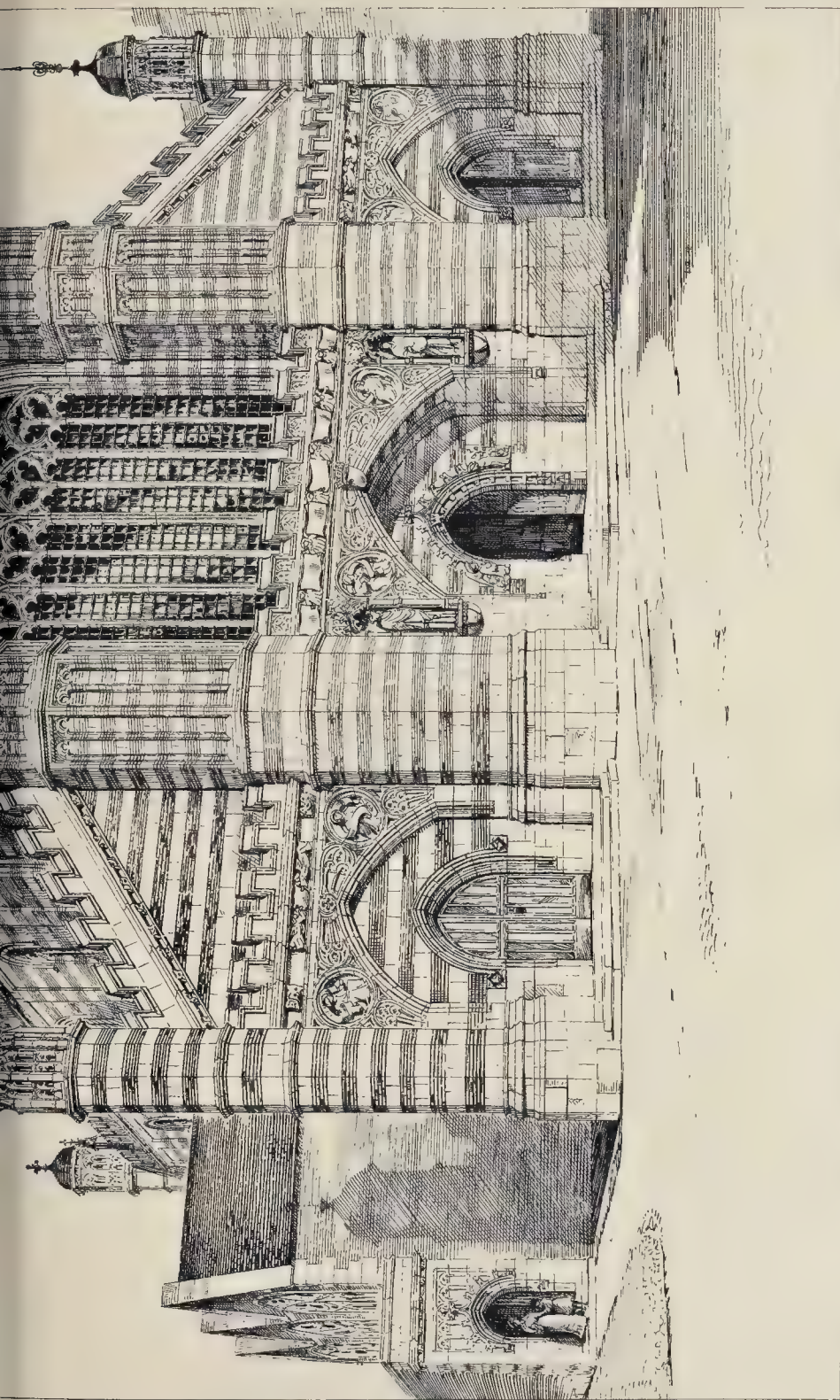
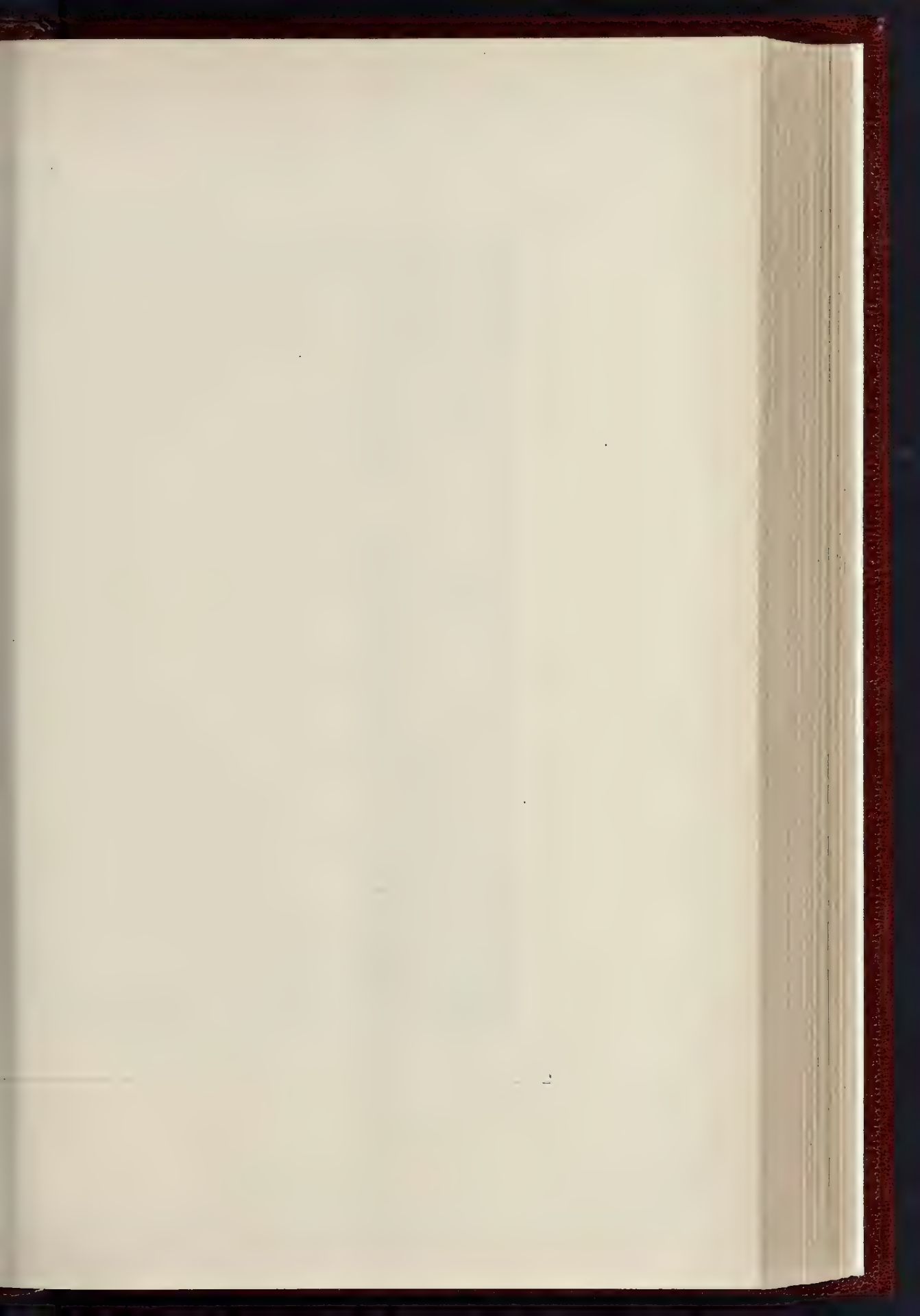


PHOTO. BY MR. SEDDING & CO. 22, MARK LANE, LONDON, E.C. 4. 1865.

EXTERIOR OF CHURCH OF HOLY TRINITY, UPPER CHELSEA.—MR. JOHN D. SEDDING, F.R.I.B.A., ARCHITECT.









THE OAK ROOM, NEW YORK

FROM A DRAWING





The Phototype Co., 33, Strand, London.

COMPANY'S PREMISES.

CROWTHER.





eration. We now come to a gap of nearly a hundred years; and we have passed out of the Gothic era altogether; and the next evidence of the presence of workmen shows them to have lived in the days of James I., a little skill in church architecture is to be expected, and no sympathy with the departed methods of work in that branch of business. Accordingly, we find the moulded jambs and allions of a fourteenth-century window, which had probably fallen into disrepair, finished at the top, not with tracery, but with a row of gurgential heads, of which the mouldings only partly agree with the original: the unskilful workman is again at work. Several other windows he put his hand to, and where he worked he spoiled; for there was no one to care what he did, nor to compel him to exercise his brain in designing. Hitherto no monument of any kind had been set up in the church; neither cross - legged knight, nor canopied recess, nor panelled tomb resplendent with heraldry, nor the kneeling figures who pray beneath the bevelled arches of King James's time. There had been no resident lord ready to wipe out his name with fine architecture, nor any family of sufficient wealth to cause a single tomb to be raised to their memory. And there was no one to see that the workman of King James's time did his business well. No doubt his woodwork is better than his stonework, for from various arguments which now line obscure seats, we gather that early in the seventeenth century a large amount of pewing must have been done; more, probably, than would have sufficed for the family pew of the squire, had there been one, which is doubtful, notwithstanding that the field adjoining the church is called the Hallows, and has a dry fish-stew at the bottom of it.

At any rate, no squire of this time has left his monument. But presently a change took place in this aspect. Some two miles off a fine mansion had been erected. The owners, now created lords, made this church their place of worship and introduced a number of changes. They took the chancel for their own use. They called to keep it warm, they lined it all round with smelling ten feet high, filled up the lofty panel arch with some kind of screen, now moved, leaving scars in the stonework; they set up the handsome communion-rail, they gave an excellent pulpit; and to the chancel wall they attached a few tablets, setting forth in the plain tongue the virtues of numerous children cut off in the flower of their ages, as well as the perilous adventures of one noble member of their family who held high command abroad. Moreover, they blocked up the priest's door, and inserted two plain square-headed windows, in imitation of the least interesting work at their own noble mansion. Perhaps it was they who gave the fine peal of five bells, cast in the year '61 by Bayre, of Kettering, and adorned with sentences more pious, probably, than the donors at length the noble family, too, went. They fit their princely seat to a melancholy decay, and the church went on with the same reputation of inefficient workmanship. It was peopled throughout with seats conducive neither to a careful consideration of the service, nor a serene disposition to slumber. Some of the old woodwork was patched together to enclose the reading desk. The doors in the north and south aisles were filled in with mockeries of ancient windows, and a new porch and south porch were provided, to the increased comfort of the congregation, and on the whole, perhaps, of much to the detriment of the architecture. And so we come down to the present day, when there exists a desire to do something towards improving the building, if only to prevent disaster arising from the shortcomings of past centuries. And shortcomings there have been, in spite of the prevalent opinion that all Gothic work is good—here it certainly is not, either in design or execution.

We have said that the north door has been filled in. It can have served no purpose for many years, for it could lead only to the churchyard, which is bounded on this side by a precipitous and inaccessible bank. Whether it was 600 years ago when the door was made we cannot tell. Perhaps then the ground sloped off gradually down to the river, so that the door was useful to those approaching from that side; and possibly among them might have been some hunted wretch making hither for protection, for the church was a forest sanctuary. How his heart must have beaten and his legs shuddered as he sped up the long hill to the friendly door!

Before leaving, we cannot but notice the floor raised many inches above its first level, swallowing the bases of the columns, and paved in part with gravestones. Most of them record the deaths of a family named Tee Boon, which, though now in a humble walk of life, may boast descent, the antiquaries tell us, from the martial race of De Bohun, of which their name is a corruption. And one stone to a man of another name states how he was married in this chancel, and lies here in hope of life beyond the threshold of death. Did he write his own epitaph, or did his widow? Whichever it was, it reveals a happy life, that he who lies buried in the transept should also record that he was married in the chancel.

#### THE CHURCH CONGRESS IN MANCHESTER:

##### ECCLIASTICAL ART EXHIBITION.

THE promoters of this exhibition have not been fortunate in the choice of rooms. The collection is placed in a set of apartments in the Museum building in Peter-street, and a more inconvenient and badly-lighted set of rooms it would be difficult to find in any public building in Manchester. It is a matter of difficulty to move about, and nothing can be seen to advantage. The collection of objects is divided into two classes; we have the usual display by firms who manufacture church furniture and church decoration, and there is a loan collection of interesting objects, both modern and antique. In the former class, the metal-workers, decorators, embroiderers, and glass painters and stainers, make the most interesting show; there are also the usual exhibits of church books and stationery, and, as a matter of course, many articles have stolen their way into the exhibition which have no connexion whatever with ecclesiastical art, such, for instance, as fancy drinks, plated dishes, knives and forks, and other articles peculiar to the domestic uses of mankind.

With few exceptions, there is nothing new, and nothing specially interesting, in the exhibition. In Benham & Froud's exhibit there are one or two new departures in brass lecterns, and in one case the substitution of an angel in dead brasswork in place of the usual eagle is a happy thought, and well carried out; the figure is well modelled and well expressed, and the book-board is formed of open tracery cleverly executed. The pastoral staff by Messrs. Thomason, of Birmingham, lately presented to the Bishop of Manchester, is really a choice piece of work; the staff and crook are of ivory, very cleverly enhanced with metal-work and precious stones, and the whole thing is a creditable production. The processional cross, lent by the Rev. J. Reeve, of St. Alban's, Manchester, is a large and important contribution to the metal-workers' art. The figure of the crucified Christ is cut from a block of silver set upon rock crystal. The cross is floriated, and the whole work richly jewelled. Messrs. Hart, Son, & Peard, Messrs. Jones & Willis, and other metal-working firms are fairly well represented.

There is not a very good display of window-glass, but many of the small drawings and some few of the cartoons are well executed. Messrs. Heaton, Butler, & Bayne, Messrs. Hemmings & Co., and Mr. Edward Frampton are well represented. The small coloured drawings by the latter gentleman are excellent; indeed, they are the only drawings which seem to catch at the richness of colour and flat treatment of old window-glass. In church-wall decoration by simple colour treatment there is not much to commend in the exhibition, if we except the clever flat treatment by Mr. R. Bennett, of Manchester. The forms and lines are good and thoroughly appropriate in character; there is also in this work a quietness and sobriety of colour to be commended.

One of the best things in the exhibition in embroidery is an altar-frontal, by the Decorative Needlework Society. It consists of a conventional treatment of the vine, executed in gold oriental thread on a crimson ground: the roots of the tree form the base of the composition in the centre; from these springs the stem, from which the branches flow over the crimson ground in a thoroughly artistic manner. If this work is a creation, and not an adaptation from an old example, it is a credit to nineteenth century design.

One of the most interesting of modern decorative inventions is the "Cloisonné Mosaic," by Mr. Clement Heaton. Here are examples which

clearly illustrate this beautiful method of work, which is so happily founded on the Cloisonné work of Oriental nations. Not only is the material cleverly manipulated, but the specimens exhibited have been very well designed by Mr. Frederick Shields. We anticipate a success for this material; it is appropriate and durable if used in smoky cities, it can be cleaned, and the cost is not prohibitive.

In ecclesiastical sculpture and stone carving, Messrs. Earp, Son, & Hobbs, make a creditable display both by actual examples and by photographic representations of executed work.

Church furniture is exhibited by Messrs. West & Collins, of Hambledon, W. & S. May & Co., Pearson & Brown, of Salford, and Hammer & Co., of London.

In the Loan Collection, Mr. George Esdaile, of Manchester, has sent a large collection of rubbings of ancient brasses, ranging from the fourteenth to the seventeenth centuries, but these are so badly hung that it is impossible to see them, and the points of interest so dear to the antiquary are lost. The brass rubbings lent by Mr. Henry Franks, of Willesden, also suffer from the insufficiency of accommodation for such objects. Mr. J. Kendrick Pyne, the cathedral organist, exhibits some interesting old MSS. and music, and Mr. Cornish has sent some antiphonals of old date and stout binding, enriched with metal work. Our space will not permit us to do justice to this portion of the Exhibition, but we must express regret at such a poor display of drawings by church architects. What few there are seem to be scattered about on staircases and other inconvenient places, whereas a separate room might well have been devoted to a collection of architects' drawings which would have appropriately illustrated the progress of church architecture during the past year.

#### MAIN DRAINAGE AND SEWAGE IRRIGATION: MORE PARTICULARLY THE BERLIN SYSTEM.

THE current number of that leading sanitary organ in Germany—the *Gesundheit*—publishes, we note, the correspondence\* which has recently taken place between Mr. Charles Hancock, F.R.S., and Herr Stadtrath Marggraf, of the Berlin Municipality, and, with it, a memorandum criticising the same, from the pen of the renowned German scientist, Dr. Alexander Müller. The latter paper has been translated by Mr. Hancock, and is forwarded to us for publication. As the subject is one of great importance to us in this country, we print the paper—

"On the subject itself" (says Dr. Müller) "I have not much to say. It is an old story, but of course it becomes new again for those who have but just gone through the experience. I myself had fancied for a time that the most reliable source of information as to the local conditions of a community would be found in the local governing bodies—for they must be in the best position to give an opinion; and on engineering questions they ought to have no other interest than to exercise an impartial judgment in respect of the works carried out by their own engineers. At the same time, it must be admitted that there are many things likely to warp the judgment and overcloud the vision, thus tempting interested parties to misrepresent matters, or, at least, to obscure the true position of affairs. I may mention as a motive, that feeling of rivalry which would prompt various local administrations in different cities to glory in having been the first in the field—the first to discover the right solution of an arduous problem. The more difficult a problem is, the more unreliable as a rule will official reports be; and the problem of a proper provision for such a system of sanitation in large cities as shall be generally recognised to be adequate, is, indeed, most difficult, and one, too, as regards the solution of which no instruction can be gained in board-rooms and administrative departments. I need hardly say that no problem of the sort can be expected to be solved exactly in the same way in the case of two different cities, and consequently when, many years ago, I was lecturing at Professor Nobbe's agricultural experimental stations on the great inquiry concerning the main drainage of Paris, I took occasion to impress upon all my hearers who wished to study the Berlin sewage disposal system, not to allow themselves

\* A translation of one of these letters appeared in the *Builder* (of August 11th last).



to be piloted about by blind enthusiasts only, but to go round with cool-headed and collected sceptics, and that not once only, but on repeated occasions and at varying seasons of the year. Indeed, many a time and at many a spot the Berlin farms look exceedingly beautiful, while at other times and in other portions of the area covered the view is desolate and forbidding, which explains why it is that we have such conflicting reports from different visitors.

It is not so many years ago since the Berlin sewage farms were a public nuisance—so much so that the Government found it necessary to order a survey, and to appoint an official supervisor for the works. From that date things took a decided turn for the better, as I have repeatedly admitted in public.

The employes on the farms originally had to carry out in a slavish sort of way orders received from an architect and an apothecary (!); and, in addition to that, they had to reckon with numerous wishes which were continually being expressed on the part of influential Municipal Councillors. After a time they obtained a freer hand, and for the last two years the special responsibility for administering the farms has been placed in the hands of an eminent and independent man, a farmer by calling and profession, who is not only capable of forming an opinion on difficulties as they arise, but is not obliged, so far as the municipality is concerned, to make any secret of things, although, of course, in his intercourse with strangers he is bound to exercise some little reserve.

As regards my attitude with reference to the question of town sanitation generally, and to the main drainage combined with sewage irrigation scheme at Berlin in particular, I may be permitted to be very brief, because for the last thirty years I have from time to time published such observations as have occurred to me according to the circumstances of the day.

For me, the main question has always been the ultimate disposal of waste products (see my work, entitled 'Die Berieselung der Wohnungen,' Dresden, 1869, Schönfeld), and from this point of view I can only treat the prophecies and hopes of the then leader of the 'German Main Drainage Fanatics' (as Von Pettenkofer called them)—namely, to the effect that all enlightened municipalities would very soon be laying down a system of sewers, if only for the purpose of coining gold out of night-soil by means of irrigation.—I can only, I say, treat these sanguine anticipations as mere childish infatuation, at least, so far as German conditions go. At the same time, of course, it never occurred to me to doubt that town sewage in certain circumstances would be a most welcome boon to agriculturists.

Now, as regards a real utilisation of the manual elements contained in sewage, there was at that time not a single case known, and I therefore eagerly seized the opportunity which presented itself, very soon after, to undertake some experiments in this direction. In the autumn of 1869 I was charged by the authorities of the city of Berlin to test a number of water samples taken from local wells and watercourses, and ascertain the relative degrees of pollution; and incidentally, in the course of my investigation, to analyse, according to various methods, the products of the purification of refuse from chemical establishments.

A year later on, the scope of the instructions given to me was enlarged so as to embrace,—so far as the agriculturally chemical part of the work is concerned,—the execution by me of a series of experiments (which had been meanwhile resolved upon) with sewage irrigation. However imperfect the arrangements for these experiments, and however small the amount of remuneration placed at my disposal for the purpose, I yet very soon discovered that sewage farming and river irrigation were two very different things, although the former presented highly interesting problems, the solution of which, from a scientific and agricultural point of view, appeared to be most important. When I first started work at Berlin, I was told by the authorities that it did not matter very much about the 'preliminary investigation of the question of sanitation and drainage'—for a sewage system would be carried out in any case. That being so, my position became rather difficult, if I was to be expected to specify the many difficulties cropping up in connexion with sewage-utilisation. They (the authorities) would not hear of any difficulties in the matter, and my proposition, therefore, that Professor Dr. Hellriegel, the well-known agricultural

chemist (then at Dahmè), should be called in to refute or confirm the results of my observations, was declined with profuse assurances of the most perfect confidence in me, and a promise that it would not be long before the materials for a thorough investigation of the question of sewage irrigation should be forthcoming.

Meanwhile, certain tactics were being pursued quite unintelligible to me, and about which, as lying outside my province, I did not trouble any further. The object of these tactics was to arrive at a resolution to be passed by the Municipal Council in favour of a main drainage system according to Hobeck's method, while at the same time the sanitation,—or, to speak more correctly, the filth and malarious condition,—of the metropolis were allowed to reach such a pitch that the very worst of sewerage systems must needs be regarded as a welcome deliverance. In this sense, and on the assumption that only an experimental sectional sewerage system, or, as we call it in Berlin, 'Radial system,' was going to be admitted, I certainly did believe, in March, 1873, that the laying down of sewers in one district of the town, with compulsory sewage irrigation as part of the scheme, would be desirable, just as before then I had made efforts to secure the carrying out of a large experiment with Liernur's process, and with other systems of deodorisation besides.

Having concluded, then, to adopt the main drainage system, the authorities, 'yielding to pressure from a public opinion bent upon securing the blessings of a sewerage scheme,' lost no time in providing for the preparation and execution of successive 'radial' main drainage works, while ordering the discontinuance of any further scientific research on the question of sewage irrigation. Herr Marggraff, a member of the Corporation, who had previously taken up a fairly impartial position as regards the drainage scheme, after being elected a City Councillor and being appointed Official Referee in the matter of the drainage works, at once commenced work in a most energetic way, promoting through thick and thin every kind of sewage irrigation advantage.

Now, it fell to my lot to watch at close quarters and as a disinterested observer, the frequently wonderful phases of the history of the Berlin Main Drainage and Sewage Irrigation scheme; and my investigations, carried out in 1870—1873, were published for the most part in official reports on the question of the 'Sanitation and Drainage of Berlin' ('Reinigung und Entwässerung Berlins'), and, to a more limited extent, at Nobbe's experimental stations.

Other essays of mine on 'Sewage Irrigation Farming,' at Berlin and in other Cities, will be found chiefly in Wilde's *Central Journal of Agriculture* (Wilde's *Landwirthschaftlich Central Blatt*), in Varentz and Eulenbergs' 'Quarterly Review of Public Hygiene' (Varentz and Eulenbergs' 'Vierteljahrsschriften für öffentliche Gesundheitspflege'), &c. I supplied also a comprehensive 'Notice' of the sanitary state of Berlin, by order of the German Council of Agriculture, as part of their researches, published under the title of 'Die Verwerthung der Städtischen Fäkalien' ('Utilisation of Town Sewage'). Three other papers of mine of more recent date on the 'Befouling of the River Panke and of the Teltower Lake with Irrigation Drainage Waters,' and on the 'Significance of the Underground Water-level in its effects on Sewage Farming' (the two first-named being prepared by me by order of a Court of Justice), have been made public in the *Gesundheit* and other sanitary organs.

Any one desirous of trying the question, whether my observations on sewage farming and my proposals for the perfecting thereof are correct from a scientific point of view, will of necessity,—whether he approach the subject in a friendly or hostile spirit,—be bound to make himself acquainted with my writings. The deputations of French senators, to which Mr. Hancock alludes, were familiar with my works before their recent visit to Berlin, and they instructed their engineering assessor, who preceded their arrival, to interview me, after which the deputation itself honoured me with two personal calls. In fact, Mr. Hancock himself seems, from the correspondence with Herr Marggraff, to be fully cognisant of what I have written on this subject; but I do not know to which particular tract of mine he is referring, and consequently am at a loss to know whether this is one of those which has accidentally escaped the notice of Herr Marggraff.

All I can say is, I have had no cause to submit my treatises and professional reports to Herr Marggraff. This was done, on the one hand, by the German Council of Agriculture, which had had materials supplied to them by the Town Council for the purposes of their official inquiry in return for which they (the Council of Agriculture) afterwards sent in a copy of those treatises and reports of mine; on the other hand, it was done also through the Courts of Justice at Berlin in the course of the pending trials. Personally, it is a matter of perfect indifference to me whether Herr Marggraff is in the habit of studying my writings or not, and I can quite understand that this much-occupied Town Councillor prefers to read the laudatory criticisms which tell him how admirably he had succeeded with his treatment of sewage by irrigation. In fact, I am almost tempted to envy Herr Marggraff that artless naïveté with which he manages to forget any disagreeable facts, and fences with accidental slips of memory, or lack of knowledge.

Permit me now to refer to Herr Marggraff's letter to Mr. Hancock of the 10th of July, which deals more or less exclusively with the reputation the administration of the sewage farms has acquired. Now, the establishment of the main drainage works did not last ten years, but only three years; and for six months out of these three years there was no irrigation whatever, or (if any) only in homoeopathic doses. The experience gained during that experimental stage so completely eluded the memory of Herr Marggraff that heactually afterwards organised the raising of wheat, rye, and other similar corn crops on a large scale, as well as of flax, rye-grass, beet, and other roots for cattle; and further did his best to get hold of English capital for the erection of a large sugar factory.

The straw of the cereals now raised with an very limited amount of sewage irrigation sells so badly in Berlin that efforts have been made to dispose of it in compressed bundles to a provincial pasteboard manufacturer.

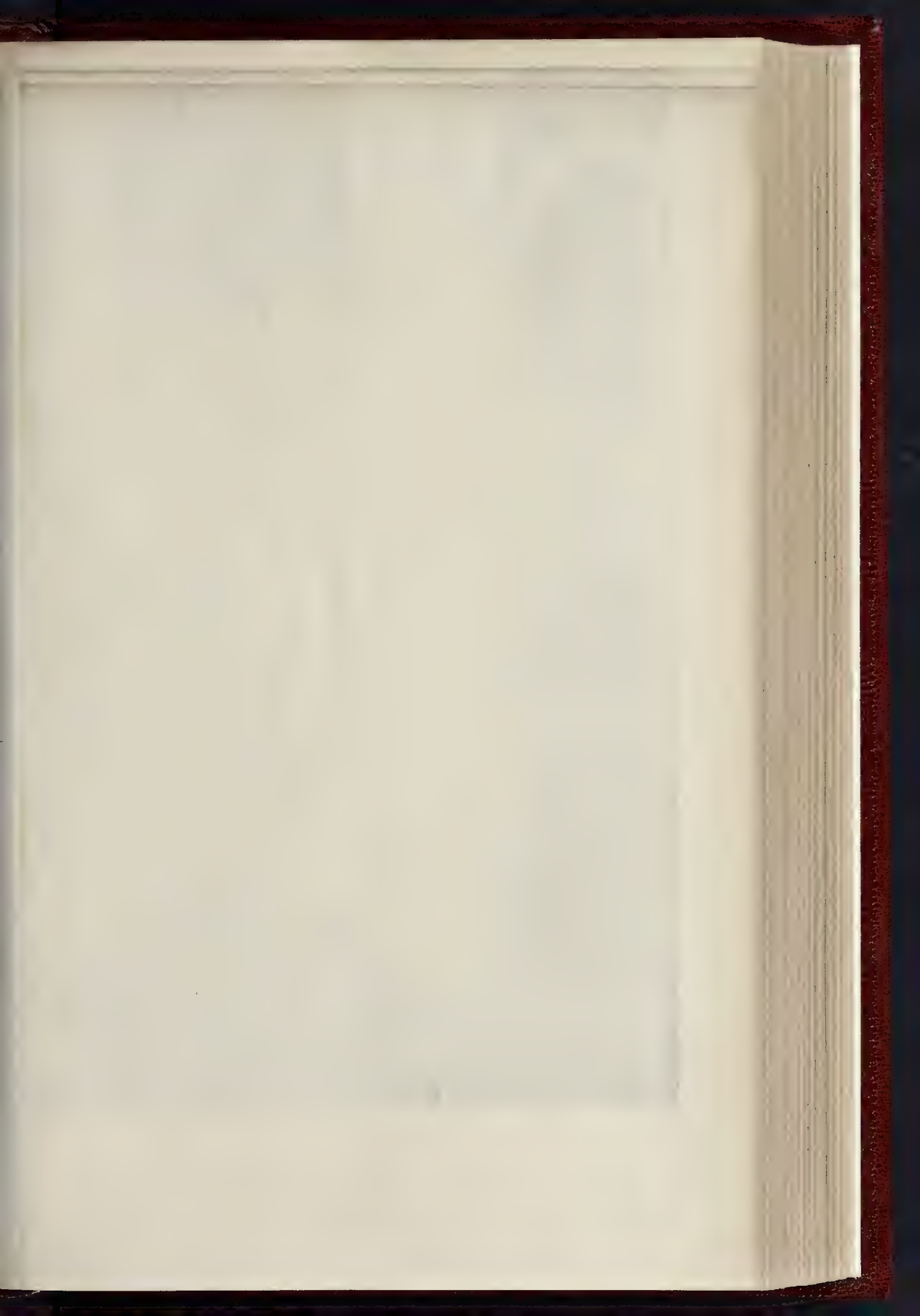
Of sewage-farming, then, carried on upon some sort of a system, we in Berlin can only speak from an experience of the last five years, or so. Fifteen years ago not a single street in Berlin was provided with sewers, much less were pumping stations even in existence.

The profits at the end of 1869 or 1870 were officially estimated at about 5 per cent., as to which the Municipality were informed by Herr Heuschmidt (of Bayreuth), agricultural engineer; Councillor Von Langsdorff (of Dresden); and G. Gerson (of Berlin), landed proprietor, that the credit balances put before them were merely gross returns. Whether the net profits on sewage farming really are now beginning to attain to 2 per cent. it is difficult to ascertain. It seems to me more consistent and more to the point to calculate what is the cost (direct and indirect) per head and year of the drainage works combined with sewage irrigation. This would, at present, be very near 5 marks as opposed to the 5 to 10 marks net profit about which the 'Main Drainage, &c., Fanatics' used to rave twenty years ago, as the anticipated yield from the utilisation of sewage.

In the further letter of the 24th of July, Herr Marggraff prides himself upon the fact that the French Senatorial deputations were 'much impressed with the clear, undisturbed appearance of the effluent obtained.' Now, twenty years ago the eminent chemist, Dr. Frankland, warned the inhabitants of London against the apparently clear water taken from the wells in that city; and if one sets no higher aim before one than this, then one may be permitted to admire, without reserve, perhaps, all that Herr Marggraff claims to have done for the works under his control.

Nor is there any occasion to argue about the amenities of the drainage system. As to its admissibility, and that of many other alleged improvements in town management, our posterity will judge differently from the present generation. Perhaps we may live to see Virchow himself revert to his sceptical attitude of 1870,—for did he not, last autumn, declare to the Berlin Municipality that no other metropolis presents a more striking example of so terrible a visitation amongst children in the form of diphtheria, scarlatina, and measles, than Berlin? Is that not a confirmation of the observations communicated by Haywood on the subject of Edinburgh, the fashionable and best-drained parts of which are constantly ravaged by the maladies referred to, including enteric fever? whereas in the poor and dirty part of the town—Auld Reekie—these diseases are but rare visitants.



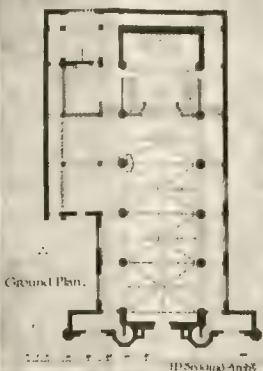


✠ CHURCH OF THE HOLY TRINITY. VPI



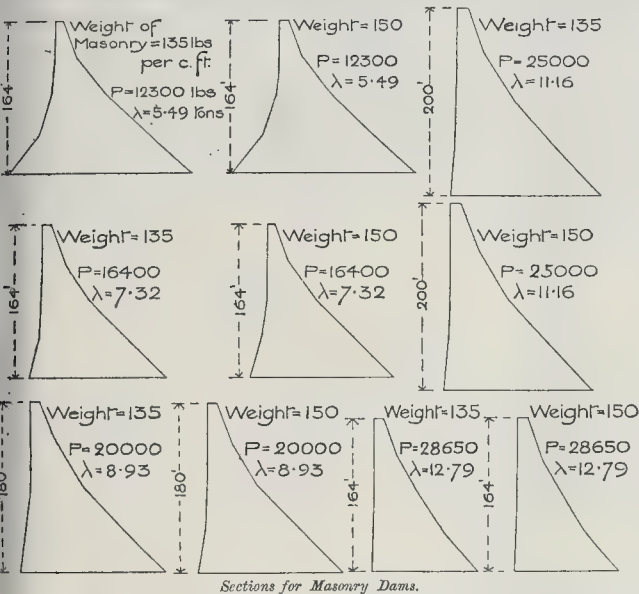


# PERCEVAL SEA: NOW IN COURSE OF ERECTION. J. D. SEDDING, ARCHT.









Sections for Masonry Dams.

The last word has not yet been heard on the situation of cities, any more than it has been the question of asphalt pavements for streets and courtyards. It cannot be denied that the self-cleansing process of the pond, permeated as it is in large towns by purities, and this, not merely in spite of the sewerage system, but largely in consequence of thus collecting the germs of disease as it re in a Pandora's box on the one hand, and the other making it impossible to plant the seeds and roadways with trees.

In conclusion, I feel myself particularly mortified by not being reckoned among those who think they have already accomplished the most possible knowledge; and even as I am convinced that by my outspoken critical remarks I have here and there been the cause of forcing on improvements, so I shall also in the future have much satisfaction in vigorously working for the agricultural utilisation of sewage.

same conditions as calculated by my formulae, and in every case the divergence of the two profiles is practically inappreciable.

I also sent a copy of M. Bouvier's investigations, translated from the "Annales des Ponts et Chaussées," which serves to show the extremely laborious character of M. Bouvier's calculations, which involve three pages and a half of printed foolscap, and the employment of the integral calculus, forming a strong contrast to my simple formulae of  $y = \sqrt{\frac{05x^2}{\lambda + (03x)}}$  for the down-stream face, and  $z = \left(\frac{09x}{\lambda}\right)^4$  for the up-stream face.

GUILFORD MOLESWORTH.

Simla, India,

August 22nd, 1888.

\*\*\* We cannot give the comparative sections obtained by Bouvier's and Sir G. Molesworth's formulae, as the differences between them are so slight in places that a large-scale diagram would be required to exhibit them; but we have thought it would add to the interest of Sir G. Molesworth's letter to give, on a small scale, his own sections as derived from his formulae. P is limit of pressure on masonry in lbs. per square foot; λ is limit in tons per square foot.

#### ANCIENT CROSS AT GLOUCESTER.

SIR,—Mr. J. Moyr Smith's letter [p. 234, ante] has not convinced me that the characteristic interlaced ornament found on the old Irish crosses originated in Scotland. He should, I think, first prove its development from earlier remains, as we are enabled in Ireland to trace it from the Runic knots on pre-Christian Ogham stones, tumuli, &c., to its fullest development in the beautiful crosses at Monasterboice and Cormac's Chapel at Cashel.

If those crosses are of Saxon origin, how is it that none of the Saxon churches in England show a trace of interlaced ornament, whilst the Irish churches from the eighth century abound in such ornaments? How is it that we can point to the shrines, metal crosses, and manuscripts, such as the Book of Kells, Annals of Clonmacnoise, and other manuscripts, covered with interlaced ornament exactly similar?

If Ireland was Christianised and civilised from England and Scotland, how is it that the Irish annals are full of the work of Irish missionaries to England, Scotland, and the Continent? I suppose that we shall next be told that St. Gall, the apostle of Switzerland, was not an Irish missionary, and that he was a Scotchman, or, perhaps, Saxon.

Your correspondent cites Strabo and Ptolemy with great gusto, and evidently believes that the ancient Irish were endowed with that "double dose of original sin" of which we have heard so much lately.

The explanation of the origin of this interlaced

ornament is that from the earliest ages Ireland had an intercourse with the East; that the ornament is of Byzantine origin; and that it was developed in Ireland. There is no authority except Mr. Smith's assertion that it came from Scandinavia.

Let Mr. Smith consult the Irish annals of the four masters and other Irish authorities, and he will find that he is utterly mistaken in thinking that Scotia was the ancient name of Scotland, the natives of which were the Picts. Scotland in time acquired the name in the same way as the South of Italy was once known as Magna Grecia.

JOHN L. ROBINSON.

#### INSPECTION OF SEWERS.

SIR,—An interesting article appears in your issue of Sept. 29 last from Mr. James G. Killey, A.-M. Inst. C.E., on the subject of the inspection of pipe-sewers. In the concluding paragraph he writes:—"Brick and concrete sewers are usually thoroughly inspected inside for line and level, and for quality of work. With pipe-sewers it is different," &c.

Mr. Killey explains an ingenious method of attempting to secure by man-hole inspection and lights that the drains are laid straight and free from internal obstructions. Where the drain is required to be perfectly straight the inspection would undoubtedly lead to the detection of any marked irregularity or obstruction, but, of course, it is inapplicable to other drains than those laid in an absolutely straight line, and even there it is not capable of detecting such cause of obstruction as rough or uneven joints. If it could detect such joints it offers no means whatever of remedying them short of lifting and re-laying the whole, with the tolerable certainty that the new drain will still be imperfect. Add to this—first, that only a small proportion of drains can be laid in long, absolutely straight lines; and, second, that Mr. Killey's method is inapplicable to the case of the smaller sizes of drain-pipes—4, 6, and 9 in. in diameter—that are most largely used. I do not wish to detract from the value of the mode of inspection advocated, but only point out that it can be applied only in few cases; and in those few cases it does not meet all the difficulties.

T. L. WATSON.

108, West Regent-street, Glasgow, Oct. 1, 1888.

#### CHURCH CORNER-STONES.

SIR,—What is the traditional custom among masons with regard to the position of a church corner-stone?

I there, or was there, any rule recognised by builders as to the spot which they were to regard as the commencement of a building?

Can your readers give me any instances earlier than the seventeenth century when corner-stones are visible and known to exist, and what is their position?

I was under the impression that they were always N.E., but I have been hearing lately of S.W. ones in old church-work, where they lay above or below the level of the surrounding yard.

ALFRED E. P. RAYMUND DOWLING.

Sledmere, Yorks.

#### UNEDUCATED PLUMBING.

SIR,—I have recently met with a case, and which is not an isolated instance, that will illustrate a deplorable defect in our present system of teaching, or, rather, not teaching,—the proper principles of plumbing w.c.s. The case referred to is of the "wash-out" description, but it fails to wash out,—in fact, is a downright fraud, simply because its unsuitable shape, and hence the useless dispersion of its motive, would require at least three or four times the quantity of water that is instantly supplied by the cistern attached to it; and, second, because the supply-pipe to the cistern from the water-main is so small that it requires ten to fifteen minutes to re-fill this too-small flushing compartment of the cistern. Can there be any wonder that, in many circumstances, such a slovenly way of doing work leads to many of the intolerable nuisances which inflict tenement houses where such nuisance-traps are permitted? In many of the so-called "wash-outs" the lines are so widely dispersed and diverted that the force of the motive is lost, instead of its being judiciously confined and concentrated to perform its duty.

A sufficient flushing force in gallons should be plainly marked on the basin, so that an ignorant plumber is not left to attach a flush cistern of insufficient capacity. In many of these so-called "wash-outs," their curves and lines are not formed in accordance with the rules of hydraulics which should control them.

F. B.

Oct. 2, 1888.

\*\*\* It is not always the fault of the "ignorant plumber." The flushing or "waste-preventer" systems permitted by the water companies are often so inadequate in size as to give no sufficient flush in any kind of basin, and to constitute a sanitary danger.



**Value of Building Sites at Gunnersbury and Hanwell.**—Last week, Mr. Richard J. Collier offered for sale, at the Star and Garter Hotel, New Bridge, fifty plots of valuable freehold building land, on the Sutton Court Lodge Estate, Gunnersbury. The estate is within five minutes' walk of Gunnersbury station of the District, Metropolitan, and North London Railways, and the Chiswick station on the London and South-Western line. The property was described as pleasantly situated overlooking the grounds of the Chiswick Park Cricket and Lawn-tennis Club, near the river, and within a mile of the Royal Botanical Gardens, Kew. Several wide roads have been laid out on the estate, named respectively Burnaby-gardens, St. Mary's-grove, Grove Park-lane, and Gordon-road. The plots offered have frontages to Burnaby-gardens and Grove Park-lane, the greater portion having frontages of 20 ft. and depths of 90 ft., whilst a few larger ones have frontages of 50 ft. and depths of 120 ft., the whole of the lots intended for the erection of high-class villas only. There was a numerous attendance of buyers, with an active demand for the several plots. Out of the fifty lots offered, upwards of thirty were sold, realising from 75*l.* to 90*l.* each, or an average of from 4*l.* to 4*l.* 10*s.* per foot frontage, the total proceeds of the sale amounting to about 2,400*l.*—Mr. Collier also submitted to competition last week, at the Lecture Hall, Hanwell, fifty-nine plots of freehold building land on the Churchfield estate, Bostonthorpe, Hanwell. The estate was described as situated a few minutes' walk from the Hanwell station of the District, Metropolitan, and North London Railways, having frontages to Bishop's and St. Dunstan's roads, leading out of the main road to Brentford, known as Boston-road. The plots varied in dimensions from 17 ft. to 25 ft. frontage, and depths of from 70 ft. to 110 ft. Several were sold at prices ranging from 18*l.* to 33*l.* each.

**The English Iron Trade.**—Although somewhat unsettled by the drop in warrants, the English iron market remains fairly firm. The fall in the warrant market has had a tendency to check buying of pig-iron at present, consumers expecting further reductions in price, and makers not showing any disposition to give way. Considering the active condition of the iron trade generally, it does not appear likely that buyers will have their way. Scotch makers quote their iron about 6*d.* a ton lower than last week. Where there is any giving way amongst makers in the North of England, the reduction is not more than 3*d.* a ton; but most manufacturers hold firmly to their previous rates. Bessemer iron in the north-west has experienced a drop in the week of quite 1*s.* 6*d.* a ton. Pig-iron remains firm both in Lancashire and Staffordshire. The buying of finished iron is somewhat slower, but the market continues pretty strong, and better prices are talked of. Sheets have gone up 2*s.* 6*d.* a ton. The demand for tinplates is very good, and rates have been advanced from 3*d.* to 6*d.* a box. There is a fairly good enquiry for nearly all classes of steel, but the chief demand is for ship-plates and angles. Shipbuilders continue to book orders, and are, at the same time, much pressed for the completion of ships in hand. Engineers keep well employed, and are able to insist upon better prices.—*Iron.*

**Book Covers.**—Should books as they come from the press have a cloth cover or a paper one? This is a question which, if fairly asked, would, no doubt, result in an answer favouring a change from the prevalent fashion of binding in cloth covers and stiff boards. Looked at from an artistic point, cloth covers are unsatisfactory. Bookbinders' cloth seldom has any of that beauty of grain or texture admired so much in leather, silk, and wool; and when attempts are made to rib or grain it in order to make the surfaces catch the light and let the shadows fall, the result is a mean and unsuccessful imitation. Besides, as a piece of decorative furniture, a cloth-bound book is seldom chosen with success; often too strong in colour for anything to come near it, there is always a cold shine that prevents the eye from resting on it with satisfaction. It is difficult, too, to understand why those who want to have their best books bound in leather of their own liking have to pay for cloth binding which has to be destroyed. Surely if a book is worth keeping it ought to be bound in leather, and if it is only one of fashion's fancy, and passing interest, paper covers are expensive enough for it. And what designs and illustrations could be printed on these paper covers!—*Scottish Art Review.*

**The Registration of Plumbers.**—A largely-attended meeting of influential persons interested in the registration and special training of plumbers was held at West Hartlepool. The Mayor of West Hartlepool presided, and was supported by the Mayor of Hartlepool; Prof. Garnett, Durham College of Science, Newcastle; Dr. Gourley, Medical Officer of Health; Mr. J. W. Brown, C.E., Borough Surveyor; Dr. Swanwick, and others. A large number of journeymen and apprentice plumbers were present. The Chairman drew attention to the public importance of the object which the meeting was called to promote. It might be asked why plumbers should receive more attention than any other class of craftsmen. He had no doubt, however, that when they came to consider the serious injury to health which might result from the imperfect joining of a drain-pipe, they would see how necessary it was that plumbers should undergo proper training. They might just as well have no drain-pipes at all as bad connections. The Secretary of the District Council for the Registration of Plumbers explained the way in which the system was originated by the Worshipful Company of Plumbers at the "Healtheries," and drew attention to the fact that their object was not limited to mere registration of plumbers, but that it included a scheme for the education of apprentices in subjects which would be of the greatest possible use to them in the exercise of their craft. The Mayor of Hartlepool expressed the pleasure he felt at being present. He, like many others, had suffered from bad plumbing. The future plumbers would have to work with their heads more than they had done in the past. Therefore they must look to their laurels. He hoped the registration of plumbers would bring about a reduction of both plumbers' and doctors' bills. Mr. Brown, C.E., said that from time to time, not only in that town but in other localities as well, he had come in contact with plumbing work which was a scandal to the trade. He felt, therefore, the strongest sympathy with the registration scheme, and he believed it would create a healthy rivalry among the members of the craft, which would be for the good of the country generally. Professor Garnett said that their object was to raise plumbers, by means of technical instruction, more on a level with the medical profession, so that occupiers of houses would find them trustworthy advisers in cases of sickness. They wanted the assistance of architects, who should make a special point of giving the plumbing portion of their contracts to registered plumbers. Councillor Pyman (Chairman of the Health Committee), Dr. Gourley, Mr. Brown, C.E., and Councillor Garry were elected to represent the public, and four masters and four journeymen to represent the plumbing trade on the District Council.

**New Recreation Grounds at Croydon.**—Some time since the Corporation of Croydon decided upon the purchase of land for the purpose of forming a recreation ground, and the undertaking is now about to be carried out, the Local Government Board having just agreed to the application of the Council for permission to purchase the necessary land. The sites which the Local Government Board have empowered the Council to purchase are altogether about twenty-five acres in extent, and are situated partly in Upper Norwood and partly in South Norwood. The land to be secured belongs to the Ecclesiastical Commissioners, the London and Brighton Railway Company, the Crystal Palace Company, the Briton Medical Life Assurance Company, and some private owners. The cost of purchasing the land and laying out the grounds is estimated at 25,000*l.*, and the Corporation have decided to proceed immediately with the works.

**Featherstone Sewerage.**—The Local Board of Featherstone, near Leeds, having received notice of complaint from Lord St. Oswald, as to a nuisance arising from their present sewage farm, Mr. M. Paterson, M. Inst. C.E., of Bradford, has been instructed to report as to the best means of remedying the nuisance. His conclusions are: (1) That the twenty-five acres of land now leased to the Board for sewage irrigation by gravitation, are useless, being four or five feet of strong and intractable clay with no soil worth of the name; (2) that to lift the sewage fifty feet on to the nearest land suitable for the purpose would cost 5,000*l.*; (3) that precipitation works would be more costly than land filtration, with a less efficient result; and (4) that land filtration works over five acres of land, at a cost of 1,350*l.*, offers the best practicable means of extricating the Board from their present dilemma.

**Conversion of a Public Hall into Steam Laundry.**—St. Andrew's Hall, Balham, which has for several years past been largely used for public meetings, concerts, and other entertainments, has just been purchased by a company of City capitalists, with the intention of converting it into a steam laundry, and a few days since the whole of the fixtures, fittings, and furniture, including stages, play-forms, stage scenery, and organ, were disposed of by public auction prior to the alterations the building being commenced. The sale at conversion of the hall has come upon the inhabitants of Balham as a surprise, as it was almost in constant use for public purposes, and considered to be a profitable undertaking. It is stated that the owner was induced to part with the property by a very tempting offer from the City capitalists. As the population of Balham is rapidly increasing, the inconvenience of being without a public hall is being much felt, and already a committee has been formed with the view of securing the erection of a new public hall.

**Lord Huntly's Estates, Deeside.**—Some portions of the Marquess of Huntly's Deeside sporting estates will be offered for sale at Edinburgh on the 17th instant. The eight lots comprise the Glentanar deer forest (upset price 120,000*l.*) which was in the market last year; Aboyne village and Rosshall (30,000*l.*); Birnie Forest and Huntly Lodge, Aboyne (40,000*l.*); the Muir of Dess (11,000*l.*); Braerudochach Ferrar, by the Dinnet Burn (15,500*l.*); and Deeside south of Deeside-road, with nearly three miles of salmon-fishing on the Dees (18,000*l.*).

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |           |      |         |
|----------------------------------------------|-----------|------|---------|
|                                              |           | £.   | s. d.   |
| Teak, E.I.                                   | load      | 8 0  | 0 12 0  |
| Sesquios, U.S.                               | foot cube | 0 2  | 3 0 3 3 |
| Birch, Canada                                | load      | 2 15 | 0 4 15  |
| Fr. Dantzig, &c.                             | load      | 2 0  | 4 0     |
| Oak                                          | load      | 2 0  | 4 0     |
| Canada                                       | load      | 4 0  | 6 10 0  |
| Pine, Canada red                             | load      | 2 10 | 0 3 10  |
| Canada yellow                                | load      | 2 10 | 0 4 0   |
| Lath, Dantzig                                | fathom    | 3 0  | 0 6 0   |
| St. Petersburg                               | load      | 5 0  | 0 8 0   |
| Walwood, Odessa, &c.                         | load      | 2 10 | 0 3 0   |
| Deas, Finland, 2nd and 1st                   | std. 100  | 9 0  | 0 10 0  |
| 4th and 3rd                                  | std. 100  | 7 0  | 0 9 0   |
| Riga                                         | std. 100  | 7 0  | 0 8 0   |
| St. Petersburg, 1st yellow                   | std. 100  | 9 10 | 15 0    |
| 2nd                                          | std. 100  | 9 0  | 0 10 0  |
| Sweden                                       | std. 100  | 7 10 | 0 10 0  |
| White Sea                                    | std. 100  | 10 0 | 17 0    |
| Canada, Pine, 1st                            | std. 100  | 16 0 | 0 25 0  |
| 2nd                                          | std. 100  | 10 0 | 0 17 0  |
| 3rd                                          | std. 100  | 7 10 | 0 10 0  |
| Spruce, 1st                                  | std. 100  | 9 0  | 0 10 0  |
| 3rd and 2nd                                  | std. 100  | 7 0  | 0 8 10  |
| New Brunswick, &c.                           | std. 100  | 6 10 | 0 8 0   |
| Russia, all kinds                            | std. 100  | 5 10 | 0 12 0  |
| Flooring Boards, sq., 1 in., prepared, First | std. 100  | 0 11 | 0 0 14  |
| Second                                       | std. 100  | 0 8  | 0 10 0  |
| Other qualities                              | std. 100  | 0 7  | 0 7 0   |
| Cedar, Cuba                                  | foot      | 0 0  | 34 0 0  |
| Honduras, &c.                                | foot      | 0 0  | 34 0 0  |
| Australasia                                  | foot      | 0 0  | 34 0 0  |
| Mahogany, Cuba                               | foot      | 0 0  | 44 0 0  |
| St. Domingo, cargo average                   | foot      | 0 0  | 44 0 0  |
| Mexican                                      | foot      | 0 0  | 44 0 0  |
| Tobacco                                      | foot      | 0 0  | 44 0 0  |
| Honduras                                     | foot      | 0 0  | 44 0 0  |
| Box, Turkey                                  | ton       | 5 0  | 0 12 0  |
| Walnut, Italian                              | foot      | 0 0  | 44 0 0  |

## METALS.

|                            |     |       |        |
|----------------------------|-----|-------|--------|
| Iron—Bar, Welsh, in London | ton | 4 17  | 6 5 0  |
| " " at works in Wales      | ton | 4 7   | 6 4 0  |
| " Staffordshire, in London | ton | 5 5   | 0 15 0 |
| Copper—                    |     |       |        |
| British, cake and ingot    | ton | 78 0  | 0 80 0 |
| Best selected              | ton | 80 0  | 0 81 0 |
| Sheets, strong             | ton | 88 0  | 0 0 0  |
| Chill, bars                | ton | 98 0  | 0 0 0  |
| Lead—                      |     |       |        |
| P.P., Spanish              | ton | 14 7  | 6 0 0  |
| English, common brands     | ton | 15 0  | 0 15 2 |
| Sheet, English             | ton | 18 2  | 6 0 0  |
| Sprits                     |     |       |        |
| Silesian, special          | ton | 19 5  | 0 0 0  |
| Ordinary brands            | ton | 19 0  | 0 0 0  |
| Tin—                       |     |       |        |
| Straits                    | ton | 102 0 | 0 0 0  |
| Australian                 | ton | 102 0 | 0 0 0  |
| Zinc—English sheet         | ton | 22 0  | 0 23 0 |

## OILS.

|                        |        |       |         |
|------------------------|--------|-------|---------|
| Linseed                | ton    | 19 5  | 0 0 0   |
| Cocount, Cochín        | ton    | 28 0  | 0 27 10 |
| Asylon                 | ton    | 25 0  | 0 0 0   |
| Palm, Lagos            | ton    | 23 10 | 0 0 0   |
| Rapeseed, English pale | ton    | 28 10 | 0 0 0   |
| " brown                | ton    | 27 0  | 0 27 5  |
| Cottonseed, refined    | ton    | 21 15 | 0 22 0  |
| Tallow and Oleine      | ton    | 19 0  | 0 45 0  |
| Lubricating, U.S.      | ton    | 4 0   | 0 8 0   |
| " refined              | ton    | 7 0   | 0 12 0  |
| Turpentine—            |        |       |         |
| American, in casks     | cwt.   | 1 11  | 0 0 0   |
| Tar—                   |        |       |         |
| Stockholm              | barrel | 1 1   | 0 0 18  |
| Archangel              | barrel | 0 11  | 0 0 11  |



|                                      |     |   |   |
|--------------------------------------|-----|---|---|
| Smith & Goodwin.....                 | 682 | 0 | 0 |
| W. Harrison .....                    | 678 | 0 | 0 |
| J. Cocker .....                      | 670 | 0 | 0 |
| Moore & Sons .....                   | 600 | 0 | 0 |
| Brookes & Sons .....                 | 598 | 0 | 0 |
| Chapman & Hollingworth.....          | 595 | 0 | 0 |
| E. Roper.....                        | 595 | 0 | 0 |
| Bargess & Galt, Ardwick, Manchester* | 580 | 0 | 0 |

\* Accepted



SEVENOAKS. For levelling, metalling, kerbing, channelling, tar paving, sewers, storm-water drains, with man-holes, ventilators, gullies, &c., to the following private roads, for the Sevenoaks Local Board. Mr. Jabee Mann, Town Surveyor:—

|                                     | Part of Argyle-road. | Victoria-road. | Road by Infant School and Savings Bank. | Totals.     |
|-------------------------------------|----------------------|----------------|-----------------------------------------|-------------|
| George Osenton, Westerham           | £423 7 6             | £459 19 0      | £153 13 0                               | £1,035 19 6 |
| James Dickson, St. Alban's          | 387 15 6             | 472 7 10       | 164 5 10                                | 1,024 9 2   |
| J. L. Cattell, Lowestoft and London | 429 0 0              | 410 0 0        | 150 0 0                                 | 989 0 0     |
| Thomas Lanebury, Bromley            | 397 17 2             | 438 14 7       | 142 10 10                               | 978 2 7     |
| George Bell, Tottenham              | 398 0 0              | 434 0 0        | 145 0 0                                 | 977 0 0     |
| W. Langridge, Croydon               | 390 0 0              | 410 16 3       | 144 13 3                                | 945 8 1     |
| Henry Owen, Sevenoaks               | 376 10 1             | 384 13 6       | 126 15 5                                | 886 4 11    |
| Henry Lake, Croydon                 | 397 11 11            | 389 11 9       | 140 15 3                                | 897 11 11   |
| Surveyor's estimates                | 388 19 8             | 414 16 3       | 137 2 6                                 | 940 18 3    |

\* Accepted according to schedule of prices.

MANCHESTER.—For alterations, &c., to the branch store, Clayton, near Manchester, for the Droyden Co-operative Society. Mr. Frederic Smith, architect, 22, Bridgewater-chambers, Manchester. Quantities by the architect:—

|                          |          |
|--------------------------|----------|
| J. Riley                 | £195 0 0 |
| Shermatt                 | 177 0 0  |
| Haughton                 | 174 17 6 |
| E. & O. Jackson          | 175 0 0  |
| P. W. Bates              | 160 0 0  |
| Hannah Fielding, Droyden | 160 13 0 |

\* Accepted.

NORTH FINCHLEY.—For the erection of shop and dwelling-house in the High-road, North Finchley, for Mr. E. Painter. Mr. G. H. Greatbach, architect, 51, Moor-gate-street, E.C. No quantities:—

|                            |          |
|----------------------------|----------|
| J. Grover & Son            | £900 0 0 |
| C. Plowman                 | 780 0 0  |
| Stillwell & Ely (accepted) | 675 0 0  |

PAIGINTON.—For business premises in the Palace-avenue, Paignton, for Mr. Wm. Lambhead. Mr. Geo. Soudon Bridgman, architect, Torquay:—

|                        |            |
|------------------------|------------|
| P. W. Vautone          | £2,439 0 0 |
| C. & R. E. Drew        | 2,425 0 0  |
| H. P. Rabbich          | 2,372 13 0 |
| H. Webber              | 2,369 0 0  |
| M. Bridgman (accepted) | 2,357 18 6 |

PAIGINTON.—For masons', slaters', and plasterers' work in connexion with the erection of business premises in Victoria-street, Paignton, for Mr. Robert Waycott. Mr. George Soudon Bridgman, architect, Torquay:—

|                        |            |
|------------------------|------------|
| H. Webber              | £1,158 0 0 |
| H. P. Rabbich          | 1,148 5 0  |
| M. Bridgman            | 1,148 0 0  |
| S. Webber              | 1,133 0 0  |
| P. W. Vautone          | 1,118 0 0  |
| E. Westlake (accepted) | 920 0 9    |

PAIGINTON.—For school buildings in Wall-street, Paignton, for the Mariat Fathers. Mr. George Soudon Bridgman, architect, Torquay:—

|                      |           |
|----------------------|-----------|
| Dehlafield & Pollard | £362 10 0 |
| C. & R. E. Drew      | 350 0 0   |
| Marcus Bridgman      | 350 10 0  |
| H. Webber            | 349 0 0   |
| H. P. Rabbich        | 345 10 0  |

PENGE.—For a hall and other additions to the Penge Conservative and Unionist Club, Beckenham-road, Penge, for Mr. J. Blundell Maple, M.P. Mr. Morton M. Glover, architect:—

|                  |            |
|------------------|------------|
| R. Eustace & Son | £2,013 0 0 |
| T. Woolton       | 1,209 5 0  |
| J. Hollingsworth | 1,118 16 0 |
| J. W. Jones      | 993 0 0    |
| H. R. Ockenden   | 988 0 0    |
| Wm. Fox          | 917 0 1    |

PENGE.—For alterations and additions to the Penge and Upper Norwood Constitutional Club, Mastic House, Anerley-road, for Mr. J. Blundell Maple, M.P. Mr. Morton M. Glover, architect:—

|                |           |
|----------------|-----------|
| T. Woolton     | £495 15 0 |
| W. G. Masters  | 387 0 0   |
| W. Fox         | 288 0 0   |
| J. W. Jones    | 288 0 0   |
| H. R. Ockenden | 267 0 0   |

SWINTON.—For new porch, vestry, and organ loft at the Unitarian Free Church, Jane-lane, Swinton, near Manchester, for the trustees. Mr. Frederic Smith, architect, 29, Bridgewater-chambers, Manchester. Quantities by architect:—

|                                        |           |
|----------------------------------------|-----------|
| Rawlinson, Swinton (accepted)          | £417 10 0 |
| For one Turret on Roof                 |           |
| Rawlinson (accepted)                   | £31 10 0  |
| For additional Heating Pipes and Coils |           |
| Major, Pendleton (accepted)            | £38 0 0   |
| For one Paint and Canvas               |           |
| Chorlton, Stalybridge (accepted)       | £41 0 0   |

TONBRIDGE.—For the enlargement of day-school, Barden-road, Tonbridge. Mr. S. W. Haughton, architect and surveyor, East Grinstead:—

|                            |          |
|----------------------------|----------|
| Cuthbert, W. F., Tonbridge | £215 0 0 |
|----------------------------|----------|

\* Accepted.

TUNBRIDGE WELLS.—For alterations and improvements to the Wesleyan Chapel, Vale Royal, Tunbridge Wells. Mr. W. S. Haughton, architect and surveyor, East Grinstead:—

|                                       |          |
|---------------------------------------|----------|
| White & Humphries, Tunbridge Wells    | £199 0 0 |
| Strange & Sons, Tunbridge Wells       | 185 5 0  |
| J. Jarvis, Tunbridge Wells (accepted) | 191 0 0  |

WOODFORD (Essex).—For reconstructing the roof and top floor of Salway House, for Mr. J. R. Roberts. Mr. J. Kingwell Cole, architect, 28, Mount-street, Grosvenor-square, W. No quantities:—

|                                    |          |
|------------------------------------|----------|
| A. Reed, Stratford                 | £875 0 0 |
| Wells, Woodford                    | 535 0 0  |
| Wall Bros., Kenilworth             | 530 0 0  |
| Osborn & Sons, Woodford (accepted) | 458 0 0  |

Paneling, 40, 52, Staines-street.—We are asked to say, in reference to a tender which we inserted in our issue of the 22nd ult., p. 222, relative to an accepted estimate for oak-paneling for Mr. Wilson Noble, that Mr. Stenhouse is architect only for some of the interior fittings, and not for the building.

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Now ready, READING CASES, 9 NINEPENCE EACH. (By post carefully packed), 1s.

#### TO CORRESPONDENTS.

C. W. (thanks, and required).—One of the Unemployed suggestion is utterly out of the question. Local authorities will not pay the least attention to it. Their only business is with the Unemployed. T. F. W. we cannot get into the matter further. The scheme is an impractical one.—D. A. the figures and calculations as to comparative economy of back-to-back houses, referred to in our article, were those of Dr. Barry and Smith, not our own, as was clearly stated. We cannot venture in printing a letter in attenuation of back-to-back houses. We have nothing to say to them at any price.—N. A. N. we cannot undertake to answer questions of that kind. We note the note of C. & S. (below our mark).—F. L. (too late).—J. W. B. (too late). All statements of facts, lists of readers, &c., must be accompanied by the name and address of the sender, not necessarily for publication, but so that we may be able to return answers to the sender. We are compelled to decline printing out books and other addresses.

Note.—The responsibility of signed articles and papers rests with the authors, not with the publisher.

We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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CORSHAM DOWN. FARLEIGH DOWN.

BOX GROUND. COMBE DOWN.

WESTWOOD GROUND. STOKO GROUND.

THE BATH STONE FIRMS, Limited.

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#### Asphalte.

Seyssel, Patent Metallic Lava, and White Asphaltes.

M. STODART & CO., Office:

No. 90, Cannon-street, E.C. [Ad.]

SPRAGUE & CO'S

INK-PHOTO PROCESS,

22, Martin's-lane,

Cannon-street, E.C. [Ad.]

Garside's Noted Bedfordshire Coarse Fine Silver Sand.—Is perfectly free from impurities and the best and cheapest in the market. All quality stock, for every purpose required in the building trade, filtration, or for nursery purposes. All pure grit! Apply to

GEORGE GARSIDE, JUNR., F.R.H.S., Leighton Buzzard. [Ad.]

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The Bank of England and its Branches, including New Law Courts Branch, now building.

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As approved by the Metropolitan Board of Works (used in large numbers at Covent Garden Theatre).

IMPORTANT COMMUNICATION.—FIRE AT WHITELEY'S.

WILLIAM WHITELEY, Westbourne Grove,

London, Oct. 12th, 1887.

HOBBS, HART, & CO., LIMITED.

GENTLEMEN.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting power of your Strong-room doors and the Safes.

The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable.

The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new building now in course of erection.—I am, Gentlemen, faithfully yours,

(Signed) WILLIAM WHITELEY.

Offices and Warehouse: 76, CHEAPSIDE, London; Manufactories, Wharncliffe Works, Arlington-street, London, W.



# The Builder.

VOL. LV. No. 2384

SATURDAY, OCTOBER 12, 1885.

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### Excavations at Strata Florida.



IN the wildest district of "wild Wales," four miles from Strata Florida station, on the Manchester and Milford Railway, stood the once famous Church of Ystrad Flur or Strata Florida, the Westminister Abbey of Wales. Founded in the year 1164 by Rhys ap Gruffydd, Prince of South Wales (he whom the English called the Lord Rees"), it was destroyed by lightning during the wars of King Edward I., but important did this centre of civilisation appear to the conqueror of Wales that he wanted a sum of 784. towards the re-edification of the Abbey. In 1402, when Owain Glyndwr was in arms against the English, Henry, Prince of Wales, afterwards Henry V., occupied the building with 600 archers and 120 men-at-arms. About the year 1535, Leland visited Ystrad Flur. He notes down that "the Church of Strate flur is large, side lild, and cross lild. It is a large cloyster; the fratri and infirmary be now mere ruins; the coematori, wherein the counteri about doth buri, is very large, and meanelly waulled with stone, in it be 39 great hue trees, the base court or camp before the abbey is very faire and larg."

The revenue of this foundation at the time of the dissolution was estimated at £22. 6s. 8d. It fell into the hands of the Medman family, who erected a mansion (ard by.

Buck gives a view of the ruins in 1741, and depicts (besides the Norman west door which still exists) a portion of the south transept, with the great arch belonging thereto. He omits, oddly enough, a piece of wall representing the western angle of the north transept, which was standing last year, but has since fallen. For four centuries this Cistercian monastery was the burial-place of Welsh worthies, and during that period the inmates of Strata Florida were engaged in compiling the history of Wales. Here were probably written both the "Annales Cambrie" and the "History of the Princes." Strata Florida should, indeed, be holy ground to every patriotic Welshman. Until the other day, all we knew of the plan was gleaned from Leland's notes; concerning the details of the structure we were in absolute ignorance. Now, thanks to the indomitable

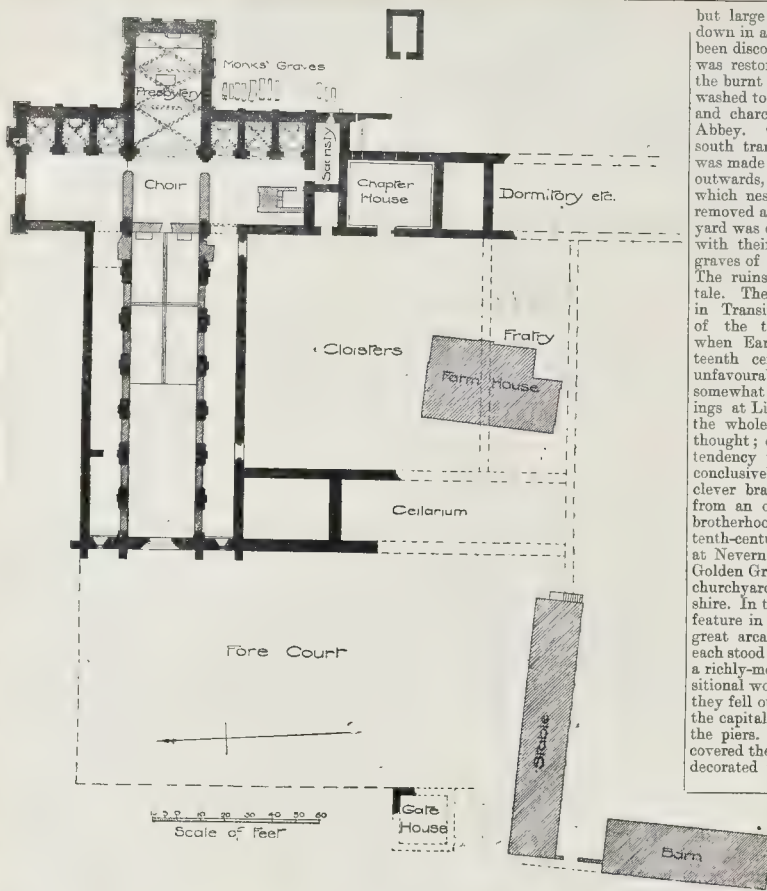
energy of Mr. Stephen Williams, F.R.I.B.A., we actually know more about this buried abbey of the Cistercian monks than we can glean concerning the architectural details of many a village church, which, though never dismantled, has passed through the restorer's hands.

At the Swansea Congress of the Cambrian Archaeological Association, in 1886, the society voted a small grant towards exploring the ruins of Strata Florida. Work was commenced by Mr. Williams in June, 1887. A few weeks' digging proved that we have here the site of a very important ecclesiastical building, of which the dimensions were as follows:—Total length, 213 ft.; length of nave, 132 ft. 6 in.; width of nave and aisles, 61 ft.; length of transepts, including central tower, 117 ft. 3 in.; width of transepts, 28 ft.; square of lantern central tower, 28 ft.; length of choir, 52 ft. 6 in.; width of choir, 28 ft. Above ground we had a fragment of the west wall, in which was the west doorway, and the west window of the south aisle. The former is a very fine piece of work, and fortunately well preserved. It consists of a semicircular arch, with five shafts carried round the arch unbroken, terminating on the wall face in a rich ornamentation, the device somewhat resembling a crosier. The window is a Transitional Norman light, recessed for a shutter, and apparently not originally glazed. Mr. Williams commenced operations on the threshold of the western door, and, having removed 3 ft. of rubbish, arrived at the floor level. From this spot he worked eastward, gradually disclosing the plan of the building, and bringing to light an invaluable collection of carved details. About half of the nave and the north and south aisles have been absolutely cleared, together with the whole of the north transept and its three eastern chapels, half of the presbytery, the exterior of the north transept, the east end of the presbytery, the east side of the south transept and chapter-house; here were great freestone pilinths and fine buttresses, showing that in all probability the entire building once had fine-dressed freestone quoins throughout. Mr. Williams thinks that the neighbours greedily stole these said quoins for building purposes, and thus brought about the destruction of the abbey. It is not impossible that the country folks also robbed the ruins of its freestone, to grind up into sand for cleaning their wooden platters. This certainly was done in other parts of Wales. A notable feature in Strata Florida must have been the contrast between the coarse

rubble walling\* and the beautifully-artistic carved details set therein like jewels in rude pinchbeck. A great deal of history may be gleaned from the actual material from which this church was constructed. The rubble work is built up of a local Cambrian stone, set in mortar of the worst description, lime being evidently scarce and dear; which proves that the builders had not command of the sea, else they would have shipped the fine South Pembrokeshire limestone and burnt it on the shores of Cardigan Bay; but the Princes of South Wales were at war with the Earls of Pembroke, so this could not be, and limestone was laboriously carried overland from some other source (Carmarthenshire, perhaps). The mortar employed in the building at Strata Florida is execrably bad, while that used by the Lords of Pembroke in their various military and ecclesiastical works is of the very best description, being actually more enduring than the stone it binds. At Strata Florida we find a small portion of the inside walling (more especially the western arch of the tower) was built of a grit stone from coal measures, presumably those of Carmarthenshire; this material was scarce and ran out, its place being taken by oolite, from Bath. Mr. Williams felt certain that the grit stones came from some older building (perhaps the Hen Mynach or Old Abbey, whose foundations may still be traced about two miles from Strata Florida); this impression of the excavators was confirmed by the discovery of a moulding carved in grit, and built into the main wall of the abbey.

This fragment had not only been carved, but coloured in fresco before it was embedded in the wall. How Bath stone got into Mid-Cardigan is somewhat of a mystery,—probably by sea, and most likely in Bristol ships, which either obtained a permit from the Earl of Pembroke, or braved his anger. It is likely that these same ships brought some yellow sandstone from the New Red Formation, which is sparingly used in the Abbey. Perhaps this beautiful material comes from the shores of the Bristol Channel. The arches and capitals seem to have been banded with a ribbing of the purple stone from Caer Fai quarries, near St. David's, a material probably obtained without much difficulty. Dug within a few hours' sail of the Cardiganshire shore, no political difficulties would stop the way, for the episcopal Lord of Devisland subordi-

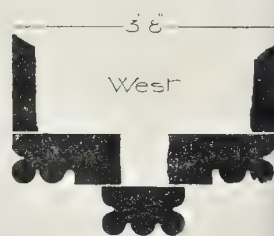
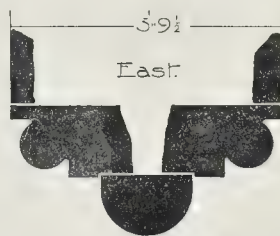
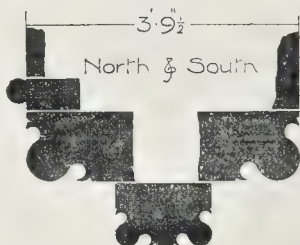
\* Very likely this was plastered, but as lime was a rarity in Cardiganshire we cannot be sure.



Plan of Strata Florida Abbey.



Strata Florida Abbey — Groined Ribs in Chapels



Strata Florida Abbey — Sections of Tower Arches.

but large masses of lead, which have been discovered. It is clear that the Abbey was restored after the fire, for we find the burnt stones were re-trimmed and li washed to conceal their scars, while the l and charcoal underlies the flooring of the Abbey. Outside the eastern wall of the south transept a most interesting discovery was made; the wall at this point had fallen outwards, and in its ruin buried the ground which nestled beneath; when the debris was removed a corner of a twelfth-century churchyard was disclosed, the head and foot stones with their rude crosses, still marking the graves of men who died seven centuries ago. The ruins of Strata Florida tell their own tale. The Abbey was evidently commenced in Transitional Norman times (latter half of the twelfth century), and completed when Early English was in vogue (thirteenth century). Its details compare unfavourably with the best English work, somewhat resembling in character the carvings at Lincoln and St. David's, but throughout the whole runs a distinctly Celtic train of thought; every pattern has more or less tendency to interlaced work, proving conclusively that he whose cunning hand the clever brain decorated Strata Florida sprang from an old school of Gaelic artists, the brotherhood to whom we owe the magnificent tenth-century wayside crosses which still stand at Nevern and Carew in Pembrokeshire, Golden Grove in Carmarthenshire, and in the churchyard of Llantwit Major in Glamorganshire. In the days of its pride, a most striking feature in Strata Florida must have been a great arcade formed by the nave columns, each stood on a plinth 7 ft. high, and supported a richly-moulded pointed arch of Early Transitional work; these have been found lying on the ground, they fell outwards, with carved fragments of the capitals and moulded bases, and shafts of the piers. In the north transept was covered the great north doorway; it had been decorated with a lily pattern, as is the north doorway in St. David's Cathedral. The respond of the south arcade is perfect to the height of several feet above the nave, and Mr. Williams believes that some portion of the piers close to the central tower exist under the debris which still buries the portion of the church. No more than six chapels adorned the

abbey, three in each transept; those to the north had clustering piers of Early Transitional work and were groined; the central carved bay with its iron lamp-loop still attached, has been found in each chapel, also the bases of the altars, while the caved-in flooring marks the graves of the noble men and women who were honoured with sepulture within the walls of the holy fane. The whole floor of the church appears to have been paved with encaustic tiles, which were formed into patterns of sixteen. The individual tiles are of peculiar

nating lay disputes to church work, probably gave the Abbey builders free access to his quarries and ports. In one of the chapels of the south transept relics of a great canopied tomb have been discovered; the head of a Saint (Bernard?) half life-size; two pair of hands, apparently male

and female (life-size), raised in prayer, and some carved floral fragments. The material from which these are cut is Caen stone; probably the monument and effigies came from France. In the ruins very distinct traces of a conflagration are discernible; not only is the carved stone-work defaced by fire,

interest. Among them are some with armorial bearings, a plain shield with a chevron, the arms of the Despencers, the dragon of Wales, and a curious figure of a man in dress worn during Edward II.'s reign.

The credit of this really important investigation is entirely due to Mr. Stephen Williams



no has collected and spent on the work about £1,000, and moved 3,500 cubic yards of rubbish. With the rubble he has very cleverly formed a nice round the Abbey, which was absolutely necessary, for the "Arries" who visit the church with had already commenced stealing the encaustic tiles. Mr. Williams also hit on an ingenious plan for keeping the wet and dirt out of the mouldering foundations; on one side he has built up a few feet of dry wall, which he has sodded with turf, thus preserving the original masonry from further injury, and at the same time clearly defining what is new work. So soon as sufficient funds may be forthcoming from his friends and the public, he hopes to cover in the chapels, and thus form a sort of museum in which will be preserved such portable relics as have been and may yet be discovered. It is to be hoped that funds will be raised, not only to clear out the interior of the church, but also the foundations of the neighbouring conventual buildings,—an undertaking that need not fail to be of great architectural and antiquarian interest. Subscriptions for the proposed will be received by Mr. R. Banks, 14, Dgebourne, Kingston.

# NOTES ON SACRISTIES.\*

BY FREDERICK CHARLES EDEN, B.A.

ALTHOUGH there has been of late years much careful study of the ancient principles of Church arrangement and their adaptation to modern needs, there has been a curious but very general agreement among architects to perpetuate a tiresome anomaly. For what argueman, at least in these days of the inevitable surplused choir, has not suffered from the ridiculous inadequacy of the modern sacristy? It is no exaggeration to say that in nine cases out of ten the ordinary parish sacristy is provided with a wretchedly insignificant room, situated under the west tower, in some equally inconvenient spot, roughly plastered, and furnished with an ink-pot, a table, and a row of pegs, while the scanty floor-space is shared by an antiquated deacon's box or safe, and the charwoman's unsavoury paraphernalia. Otherwise we shall find, in an old church especially, that the north transept aisle (if there be one), though built for quite other purposes, is cumbered with a gigantic organ-case, and the cramped and irregular space behind is made to serve as a sacristy for both clergy and choir. True it is that in more luxurious and quite modern churches the architect has been induced to pay some attention to vestry fittings, even to the extent of providing a continuous hanging-board of pitch pine, decorated, it may be, with chamfers and varnish; but the word sacristy will still recall to those who have never ventured within these penetralia of our country churches the impression of something between a lumber-room and a housemaid's closet.

The remedy for this slovenly state of things lies to a very great extent in the hands of the architects of our churches. Let them build stately and commodious sacristies, well lighted, well warmed, and well furnished, as are the churches to which they belong; and the propriety of having to make all necessary preparations for the service of the church in a clean, untidy, inconvenient, and often crowded sacristy will be at an end.

From the fourth century onwards, we find attached to churches a room or rooms, which served various liturgical and utilitarian purposes. In churches of the basilican plan, the *enophylacium*\* (as the Greeks called it), or *cryptarium* (as it was known among the Latins, and in the West generally, during the

Middle Ages), occupied the space to the north of the presbytery, the *prothesis* being correspondingly situated on the opposite side. Here the bishop took cognizance of clerical causes, and pronounced judgment against heretics, or with his presbyters received the salutations of the faithful before mass. Here, too, the oblations were made, in order that the bishop might see "*a quibus accipere oblationem debet, et a quibus accipere non debet*"; a usage which partially survives to this day in the ceremonial of the Eastern Church. Councils, as, e.g., that of Arles, and the 4th and 5th Councils of Carthage, sometimes held their sittings in sacristies; and here, finally, in an inner division or closet, were stored the ornaments of the church and of the ministers thereof. Gregory of Tours, a historian of the sixth century, speaks of a priest sleeping in the sacristy adjoining the choir; and from the same passage ("Hist. Franc." ii., 21) we learn that in the basilica of S. Martin, the sacristy was well guarded with bolts and locks, that the public were not allowed to enter, that the walls were painted, and that the precious stuffs and other ornaments of S. Martin's shrine were kept therein.

It was not, however, until the sixteenth and seventeenth centuries that the sacristy, as now understood, where priests and ministers invariably vested, and where all the ornaments and vestments belonging to the church were deposited, became common; the sacristy of medieval times having been adapted to curtain the furniture and ornaments appertaining to the service of the high altar only. For hitherto it had been the custom for the priest to vest for mass *coram populo*, near the altar at which he was about to officiate, both vestments and plate being kept in chests and aumbries in the chapels, and by the altars to which they belonged. For the choir offices, on the other hand, at least in cathedrals, churches, and others, where the clergy were very numerous, it was the custom for them to vest in the cloisters or chapter-house. Banners and crosses, meanwhile, were allowed to remain suspended against the walls and columns, a picturesque custom which still obtains in some continental churches,—e.g., in the Black Forest. Other objects were kept in the towers, or in rooms over the vaults; larger pieces of furniture (most inconveniently, it would seem) in the porch. Hence it is that we find no Gothic sacristy fully furnished, or of a size adequate to modern needs. Many conventual churches, indeed, had no sacristy at all, some part of the adjoining buildings supplying its place; and even in cathedrals a chapel was sometimes made to serve the purpose. That such makeshifts were not uncommon proves that the necessity which later centuries supplied was already beginning to be felt.

The first question to be answered in discussing the practical side of the matter is, What is the proper position for a sacristy? Almost invariable custom in England points to the north side of the chancel. But, in spite of precedent, there are reasons why the south side should be preferred. For a situation where they may enjoy the benefit of the direct rays of the sun is more favourable to the preservation of stuffs and embroideries, which are liable to deterioration by the least damp; and, in churches where the primitive custom of separation of the sexes prevails, the south is the side assigned by antiquity to men,\* and, therefore, more suitable for the sacristy where no female is permitted to enter.

As it is important that the High Altar may be promptly and efficiently served, it is well that the sacristy be not at too great a distance, so that when the site is cramped, as is too commonly the case with our town churches, a sacristy built in two stories (as at Bayeux and Coutances), but conveniently placed with regard to the altar, would be preferable to one large room in an awkward situation. The dimensions of a sacristy are determined by three considerations:—

1. The size of the church.

2. The number of the clergy.
3. The quantity of furniture and ornaments which it will be required to contain.

Thus, one small room is adequate provision for a village church, served by only one priest. A town parish, with its large staff of clergy, will require increased accommodation; while for a cathedral or collegiate church an ample room, unless supplemented by one or two annexes, will hardly suffice.

In plan it is better that a sacristy be oblong rather than square, as the latter shape is apt to cause a waste of space in the middle. In the case of large cruciform churches an L-shaped plan will often be found convenient (as at the Certosa of Pavia), both for the additional space gained and for the easy access which it affords both to the choir and to the body of the church.

The building should be roofed with a lean-to, as English medieval custom suggests, and not gabled, at any rate in smaller instances. When, however, extensive accommodation is required, a flat roof or a gable of very low pitch is recommended in order to preserve that subordinate and utilitarian aspect which is consistent with the purposes of a sacristy. Within it must be ceiled either with boards or plaster, and in no case can an open roof be permitted. Superior sacristies will probably be vaulted.

It is always advisable, but more particularly so when there is the slightest fear of damp, to introduce a crypt or basement story, which will be found useful besides as a receptacle for bulky occasional furniture, such as the bier, and also as a cellar for the sacramental wine.

It is often forgotten that a sacristy requires plenty of light and air. Lancet or loop-hole windows, therefore, are manifestly out of place, seeing that security can be readily obtained by the use of iron bars. All windows are to be kept high enough from the ground to prevent the possibility of passers-by looking in, and one or two at least must be made to open. As a rule, the square-headed form will be found most suitable and economical of space. Skylights are certainly convenient both for the arrangement of the furniture and the equable diffusion of light; but they are, nevertheless, not to be recommended (except in very cramped situations), for they are ugly, awkward to open or shut, and very frequently leak.

In order that it may be possible to enter or leave the sacristy without passing through the church, an outer door should be provided in addition to that which opens into the church. Both doors should be placed as nearly as possible in corners of the building, so as to avoid needlessly cutting up the wall-space, and thereby interfering with the economical distribution of the furniture, which, it must be remembered, consists almost entirely of continuous presses ranged against the walls. In small churches the inner door is made to open directly into the sanctuary or choir, as well for readiness of access thereto as that the priest may not be compelled to disturb any part of the congregation in passing to or from the altar.

In the larger churches in Rome (where many fine examples of sacristies are to be found) a second inner door is sometimes added, communicating with the body of the church. Thus, one door leads directly to the High Altar, *per viam breviorē*, as the liturgists say, and serves for low masses, or other functions without solemnity, corresponding to the ordinary door in small churches. The other opens upon the transept, or one of the aisles, and is more sumptuously fitted, being used for those solemn entrances when the ministers move to the altar in procession. Sacristies in Rome seldom open directly into the church, but are generally approached by a vestibule, which is furnished with benches for the accommodation of persons wishing to speak to the clergy or sacristan,—an arrangement certainly worthy of imitation in churches of the first magnitude.

It is scarcely necessary to add that all doorways must be wide enough to allow the passage of two walking abreast, and high enough for banners, crosses, &c., to enter

\* The suggestions contained in this communication bear to us eminently practical and sensible, and worth the attention of architects who are concerned in the fitting of churches. We give them, however, under the writer's name, and as an expression of individual views, because we do not think it desirable that a journal dealing with architecture in the broadest sense should formally assume the ecclesiastical standpoint from which this article is written.—Ed.  
\* "Cancellarius" ("de Secretariis Basilice Vaticane") is sometimes as many as twenty-three Latin and thirteen Greek names.

\* Bouraude, *Du Symbolisme dans les Eglises du Moyen Age*, p. 295.



without inconvenience; that the doors must be of stout make, and provided with substantial locks, bolts, hinges, stiffeners, and, in fact, every precaution against thieves, while provision should be made for a thick curtain to hang across the inner door, to prevent any noise from within being audible to those inside the church.

Where the church possesses a heating apparatus, the sacristy may well be allowed to benefit by it; otherwise a fireplace or a stove must be introduced, as dryness is a matter of the first importance. (Gas is never to be allowed; for the fumes immediately tarnish embroideries and articles of silver, while the dirt and smoke disfigure the building, and farther injure its contents. All the light that can possibly be required, even in the largest sacristies, may be readily obtained from candles, whether disposed in chandeliers or in sconces bracketed out from the walls.

No intelligent traveller who has studied churches and church arrangement in Italy can fail to have been struck with the very important part there assigned to the sacristy. Often, when the rest of the church is dirty, tawdry, and seemingly little-cared for, the sacristy is found to be clean, tidy, and even sumptuous. There silence and order reign, while the familiar duties of the place are performed with regularity, promptitude, and an entire absence of fuss. Sometimes, indeed, the actual building (the gift, it may be, or memorial of some wealthy noble or ecclesiastic) can boast of real architectural grandeur, but far more often is it conspicuous for the truly admirable nature of its furniture. Presses of great size and solid make, whose doors and cornices of dark walnut gleam with rich carving and tarsia inlay, and whose interiors exhibit every kind of ingenious device for convenience of arrangement, line the walls. There it does not surprise us to find pictures by the great masters, while an altar of precious marble, and a lavatory, perhaps, of exquisite Della Robbia ware, contribute their share of beauty and utility.

Sacristies furnished like this we must not hope for at present. The old masters, Della Robbia, the tarsia work, we must be content to admire at a distance; but the rest is well within our reach. Architectural style, presses of comely and convenient shape, not to mention cleanliness and order, we may well hope to enjoy. But until the barest requirements of our churches are better understood, whether by architects or by the clergy themselves (who are often the greater offenders on the side of ignorance), we shall have to rest satisfied with the damp surplice on a peg, and the dust-pan and brush in the corner.

Before discussing in detail the various articles of furniture necessary to a well-appointed sacristy in a church of moderate size, it will be convenient simply to enumerate the more important. Such are:—1. Presses—for (a) vestments, (b) copes, (c) linen. 2. Cupboards for metal ornaments. 3. A safe. 4. A bookshelf. 5. A vesting-table. 6. A writing-table. 7. One or more prie-dieu. 8. A lavatorium. 9. An altar, with credence and piscina. 10. Extra presses, for frontals, dossals, banners, tapestries, and hangings, of every description, according to circumstances.

These will be described in the order given.

1. *Presses*.—These are always ranged round the walls, and should be fixtures, adapted to the architectural lines of the building, and, perhaps, forming part of a continuous scheme of panelling. (a) The vestment press is arranged to hold numerous shallow drawers, or sliding trays, each adapted to contain one set of vestments (i.e. chasuble,\* stole, maniple, burse, and veil) only, and protected in front by folding-doors. The shallowness of the drawers (1½ in. is ample depth) is insisted upon lest there should be a temptation to pile many vestments in one drawer, whereby the embroideries would suffer, and the stuff very possibly become heated. It is as well that the colour of the vestments should be indicated in the front of each drawer, together

with the qualifying adjective, 'ordinary,' 'festal,' &c.

- (b) The cope is a more awkward vestment to stow away on account of its size and shape; being a slightly flattened semicircle, with radius of from 4 ft. to 5 ft. In France, semicircular presses, fitted with drawers made to turn about a centre, are in vogue; but these are not recommended, as their bulkiness is in no way compensated for by any additional convenience. It would be equally unadvisable to revive the old quadrant-shaped chests with which we are familiar at York and elsewhere, picturesque though they be. In many churches it is the custom to hang both copes and chasubles from frames or triangles, a method which has the advantage of avoiding folds, and of enabling the vestments to be thoroughly aired by merely opening the doors of the presses in which they are hung. The disadvantages of the system are that it is apt to pull the stuff if the vestments be rich and heavy, and that in the case of the chasubles it necessitates separate drawers for the stoles, &c. But, as a matter of fact, it is found that copes can usually be folded without injury, and so laid in drawers like the chasubles.

- (c) Little need be said about the linen press. It commonly contains several drawers of varying sizes, and a hanging cupboard for surplices in actual wear.

2. For the convenient bestowal of the numerous metal ornaments, such as candlesticks, vases, crosses, &c., which a well-furnished church possesses, one or more cupboards will be required. These may be arranged along the tops of the vestment presses, provided only that those which are designed to contain objects in constant use be not placed so high as to necessitate the use of steps. The shelves are usually lined with green baize, after the manner of those in a butler's pantry.

3. Every church possesses a fireproof safe for the custody of the sacred vessels, registers, and other articles of great value. The proper place for this is the wall of the sacristy, where its native ugliness can be concealed behind the panelling, though, of course, without any useless attempt at secret.

4. A bookshelf of small capacity is needful. It will only be required to hold almanacks and other books of reference likely to be consulted by the clergy, altar books (unless of great value), and, perhaps, one or two books of private devotion; choral and other books for the signers being kept in the vestry appropriated to their use.

5. The vesting table has no fixed place. It may be either in the middle of the sacristy, or, as is more usual, against the wall. It stands on a platform or footpace of wood, projecting 4 ft. in front, and is required to be large enough to allow three to vest at it simultaneously. The top of the vestment press is frequently made to serve this purpose. The dimensions of the slab must be not less than 9 ft. by 3 ft. by 3 ft. 5 in. high.

6. Of the writing-table there is nothing to be said, except that it ought to be of substantial make, convenient shape, and service-size. In village churches, and when the sacristy is necessarily small, a portable desk can be made to serve the purpose.

7. The number of the prie-dieu is, of course, to be suited to the number of priests; but it is seldom that more than three will be required.

8. Partially or wholly recessed in one of the walls is the lavatory, which is exclusively reserved for washing the hands of the priest and his ministers before any religious function. In the older examples it is composed of two parts, the cistern and the basin, and is either simple or monumental in character. In the former case a suspended or otherwise movable vessel of china or metal (of which an example may be seen in the South Kensington Museum) does duty for the cistern. In the latter, it is of stone or marble, provided with taps on the under-side. It will usually be found more convenient nowadays to lay water on; but in remote country places, where this is impossible, one or other of the

medieval expedients may well be adopted, at any rate possessing more dignity and refinement than the portable washstand, with its usual complement of domestic utensils, which is generally to be found in our vestries. The basin is provided with a drain leading to a dry well, as is the case of piscines, and a roller for a round towel is placed at the side.

9. In large sacristies an altar is a necessity and a desideratum in all. It stands against the wall at one end, and is often found recessed. This altar follows the ordinary rules for minor altars. That is to say, it will have a foot-pace, a shelf for cross and candles, sticks, a credence and a piscina. Its uses are manifold; for bishops to vest at; for priests to retire to for prayer and recollection; for special ceremonies, such as benedictions, vessels, vestments or banners; admissions to guilds and confraternities, &c. In addition to these practical uses an altar imparts to the place an air of sanctity and solemnity; and this is presumably the reason why St. Charles Borromeo, in his "Instructiones Fabricarum Ecclesiasticarum" (a small manual to be consulted with profit by all church architects for its union of sound sense with right ecclesiastical feeling) recommends that the vesting table should be arranged as a quasi-altar where space fails for an altar proper.

10. The additional presses, of which a well-furnished church will require several, must range themselves wherever space permits. A very useful shape for them to take is that in which the lower part projects, forming a continuous bench-table, or seat broken up into compartments with separate lids. These can be appropriated as receptacles for candles, stools, charcoal for the incense, wicks for the lamps, linen to be washed, &c., and will be found handy for such and many other purposes. The upper part is fitted as a series of hanging cupboards, or with drawers, shelves, or trays, according to the uses it may be intended to serve.

Whenever possible there should always be a commodious closet opening out of the sacristy, in which brooms, pails, steps, &c., are to be kept, as well as supernumerary chairs and benches.

As it was intended that these suggestions should be practical throughout, nothing has been said on the æsthetic side of the question; but there is no fear that an architect, who had any respect either for himself or for the services of the church, would neglect the beauty of that upon which the public are not permitted to gaze, or the convenience of that upon the utility of which the efficient performance of these services so greatly depends.

## NOTES.

VOLUMES III. and IV. of the "Papers of the American School of Classical Studies at Athens," the substance of which relates to the years 1884-6, both appear at last under the date 1888. This, even for an archaeological periodical, is somewhat tardy issue. However, the material is weighty. Volume III contains the complete official report of the "Wolfe Expedition to Asia Minor," conducted by Dr. Sterrett, the main results of which belong to the domain of epigraphy, and will scarcely be of interest except to the specialists. Volume IV. appeals to a wider circle. It contains a paper by Mr. Walter Miller, on the theatre at Thoricon, with supplementary reports of the excavations there by Mr. Cushing. The report is accompanied by six plates, giving full views and plans of the theatre, the discovery of which we have from time drawn attention. The theatre is of very remarkable shape,—oblong, but rounded at one end and square at the other. The site gives no sufficient explanation of this eccentricity. The paper that comes next in interest is a discussion by Mr. John M. Crow, on the Athenian *Phryx*. He is, as we believe all modern investigators are, entirely aware to the view of Dr. Curtius,

\* A chasuble (Gothic shape) is about 54 in. long by 44 in. broad in the widest part. It can usually be partially folded in the direction of its width without damage.

\* In omni sacristia aut altare, vel mensa, armarium, quod foras altaribus præbet, instructum cruce, candelis, bns, mappique constratum.



who would transform the time-honoured site into a seat of the worship of "Pelagianism." The Pryx, as restored on the plan appended to the paper, is a theatre-shaped space, as, in fact, a place of assembly for whatever purpose would, among the Greeks, naturally be; the orator standing on the *amra*, which was practically the altar, merely took the place of the protagonist in dramatic representation. The Report of the School," appended to Vol. IV., contains, we believe, the first official announcement that Mr. Charles Waldstein has been chosen Director of the School for the five years beginning in October, 1888, and has accepted the appointment on condition that a sufficient permanent fund be raised to support the school under its new organisation. The early change of Director, hitherto the custom of the American School, has, no doubt, been attended with serious disadvantages.

IN reference to the recent circular of the "General Advice" on restoration, issued by the Institute of Architects, Mr. A. W. Tomfield, whose name, along with that of Mr. Pearson, was rather prominently mentioned in the *Journal of Proceedings* as having given some special attention to the framing of the document referred to, writes to us to disclaim most emphatically having had anything more to do with drawing up the paper than any other member of the committee.

IN the number for Sept. 29 of *L'Architecture*, M. F. Roux considers the question of the proprietorship of the architect in his drawings. After referring to the various opinions on the subject, M. Roux propounds the view which we have often expressed, but which lawyers, as a rule, seem quite unable to understand, that the drawings are the architect's property, being merely his means of conveying his instructions to the builder; that the client comes to the architect to construct a building for him, not to make drawings. "Ils" (the architects) "ne doivent pas céder leurs plans pour lesquels ils construisent une construction édifiée, aux entrepreneurs qui ne les ont pas payés à part." This is the common sense of the matter, at all events where it is a question of buildings executed. M. Roux observes that the case where an architect is asked to make a scheme for a building which for any reason is not carried out, or not intended to be carried out for an indefinite period, requires separate consideration, and he proposes to deal with it in another article.

WE have received a pamphlet, by Mr. John D. Sutcliffe, on what would seem to be the neglected but highly important subject of the "ventilation of cotton mills." The author states that for the past three years he has inspected and reported on more than a thousand mills in all parts of the kingdom. He has "very often found that a few air inlets and a hole in the roof were all that was necessary for ventilating purposes" (so printed); "all that was thought necessary" we suppose is intended, as one main object of the pamphlet is to recommend mechanical ventilation by fans. The author recommends that he calls fans "of the air propeller type," but from the context it appears that what he means to recommend is an extract-fan rather than a system of propelling fresh air in under pressure. If this is what is meant he is unquestionably right. Any room in which there are many workers, and work carried on which must fill the air with numberless small particles of matter, requires mechanical extract ventilation to draw all impurities out directly and powerfully as possible. In regard to spinning-rooms, we read that

"There is always a difficulty in ventilating spinning-rooms, especially where fine counts are spun. Practical spinners often assert that a high

temperature is really necessary; but a good deal of this statement is prejudice. I have in my mind a Rochdale firm, who determined at any cost to reduce their temperature, and who now say they can spin as well at 65 deg. as they could at 85 deg., and they are usually engaged on 60's counts."

It would have been somewhat to the purpose to know why there is any real or supposed necessity for a high temperature for spinning "fine counts." This expression refers to the finer forms of thread, some of which run to a good many miles to the pound, but we have been unable to extract from cotton spinning correspondents any definite reason why high temperatures are required. We are informed that at the Manchester Exhibition the spinning of the finest counts was deferred till summer weather, but that no artificial temperature was used. The case mentioned in the above quotation seems to indicate, at all events, that cooler temperatures have been found compatible with the manufacture, and in that case every cotton-mill owner ought, for the comfort and health of his hands, to endeavour to attain these conditions. Then we read—

"Ring-spinning rooms suffer most from the heat. Last February I was in one containing 35,000 spindles, and when the outside temperature was at 45 deg. F., the temperature in the room reached 98 deg. F. This excess of heat was caused solely by the speed of the machinery, as they had no artificial heat in the room. I found it necessary in this instance to fix four 2 ft. fans down one side of the room to exhaust the hot air out, and one 3 ft. fan, fixed nearly at the opposite side, to blow the cold air in. The air from the 3 ft. fan was carried well into the room along a duct with perforated sides, and no draught was felt."

We presume the heat in this case was caused by the presence of an immense number of heated bearings in the machinery; we do not see how otherwise the speed was to raise the temperature of the room. The "gassing-room" is another department in which great need is felt of thorough ventilation, as will be understood when it is explained that "gassing" means burning off with gas what are called the "thick-ends" of the yarns; one can easily imagine what a stuffy room this would be without a powerful mechanical ventilation. The author also draws attention to the unscientific way of heating large rooms in cotton-mills, by steam pipes placed high up on the wall (with the idea of getting them out of the way), leaving the workers to suffer from cold feet, and consequent neuralgia, &c. Mr. Sutcliffe's object is an excellent one, if his definitions and suggestions are not always very lucid. A short preface by Mr. E. H. Osborn (H.M. Inspector of Factories) points out that the workpeople in these mills are breathing over and over again the same air, "more or less impregnated with dust and other impurities," and that "the solution will only be found in mechanical appliances mechanically driven with all possible economy of space and power;" in which opinion we entirely concur. We hope the subject will not be allowed to drop.

WE have received from the Local Government Board a short report by Dr. Parsons on the prevalence of diphtheria at Kilkhampton, in Cornwall. Dr. Parsons describes Kilkhampton as being on the whole, in point of sanitary condition, "better than the average of Cornish villages." The chief fault of the houses is dampness. "The floors are commonly of flagstones, and the eaves of the roofs are rarely spouted. The interiors of the houses were generally found clean, but the surroundings of many of the outlying ones were far from cleanly, the yard in front containing accumulations of manure and stagnant water." The village is partly sewered by glazed pipes, but one part is drained by an open gutter in front of the houses; other houses drain into ditches; at others waste water is poured on the gardens or ashpits. Water-supply is from pumps, mostly good, but in some places it is from wells which are liable to be contaminated. Dr. Parsons does not appear to have laid his finger on any insanitary conditions to which the outbreak of diphtheria in this case can directly be traced; but obviously the defects above referred to call for remedy, and it is a

somewhat serious reflection that this is a place "above the average of Cornish villages" in sanitary condition. Kilkhampton is in the Stratton Rural Sanitary District of Cornwall.

THE Charity Commissioners have arranged for the purchase of the site and buildings of the Royal Naval School at New Cross, and undertake to subscribe 2,500*l.* per annum towards the Technical and Recreative Institute which it is proposed to open there. Through a munificent gift by the Goldsmiths' Company of a like sum, yearly, the Committee of the South London Polytechnic Institutes are placed in a fair way of establishing their scheme in that district. The school was founded for officers' sons, in 1833, at Camberwell. On June 1, 1843, Prince Albert laid the foundation of the existing premises—a handsome, spacious building of red brick, in the Hatcham district, fronting Lewisham High-road. The site, of seven acres, is on Gunter Hill, near to Plow Garlick Hill, whereon used to stand a semaphore, the second out of town, on the line of signal stations worked upon Captain Popham's system, between the Admiralty and Deal. The intervening station was in St. George's Fields; and under favourable conditions a message could be forwarded the whole distance of seventy-three miles in sixteen minutes. New Cross is reputed to take its name from the once celebrated posting-house, the Golden Cross, on the road to Dover. In his diary Evelyn writes, under date Nov. 10 (1675). "Being the day appointed for my Lord Ambassador to set out, I met them with my coach at New Cross." The ambassador was George, fourth lord and first Earl of Berkeley, who had been appointed to France, and as plenipotentiary for the general treaty of peace at Nimeguen. The subscription of 2,500*l.* a year by the Goldsmiths to what will be known as the Goldsmiths' Company's (New Cross) Institute is from out of their corporate funds, not being trust funds, over which they have absolute control. According to information supplied by them to the School Board for London, in March, 1879, their list of fifty-eight divers charities represented an annual disbursement of 10,901*l.* 14*s.* 1*d.* In their report of February, 1881, the Board maintain that there is a total income of nearly 113,000*l.* a year derivable from the trust funds of the seventy-eight City Guilds which, in terms of Section 30 of the Endowed Schools Act, 1869, should, in their opinion, be re-appropriated towards the support of higher elementary and technical schools.

LAST week, in response to an expressed desire on the part of the Finance Committee, the architects and measurers of the Glasgow Exhibition furnished a statement of the total structural costs to the close of September. The estimate of the architect before the commencement of operations stood at 69,128*l.* Up to the period of the opening, early in May, the work accomplished (so we learn from this statement) represented an outlay, actually, of 74,461*l.*—an excess of about 7½ per cent. over the forecast, and certainly, under the circumstances, not an outrageous excess over the original reckoning. The main building, with foundations, had by that time summed to a total of 58,847*l.*, or about 5,000*l.* higher than the estimate, and therein accounting for very nearly the whole of the gross excess. Boiler-shed, chimney, and sundry other less bulky erections of the "lean-to" order cost 3,262*l.*, while the grounds and all independent works and erections thereon, including the Bishop's Castle and the deepening of the Kelvin, ran to a total of 12,352*l.* Analysis of individual items shows that the Bishop's Castle cost 2,035*l.*, as against 1,800*l.* estimated, and the Kelvin excavations 1,121*l.*, as compared with 890*l.* the original allowance; but, on the other hand, there was a saving of nearly 300*l.* on the making-up of the grounds, attained partly by the co-operation of the Parks permanent staff of gardeners and workmen. Structural outlay by no means ceased at the nominal completion of the building, but has been going on to a certain



## INVENTIONS, AND HOW TO PATENT THEM.

BY A BARRISTER.

THERE can be no question that there are thousands of persons who are authors of ideas that are of marketable value, which, if they were only shown the way, they could turn to solid advantage to themselves, and, at the same time, benefit the community at large.

Among the popular errors which are allowed to go uncorrected are the following: Firstly, that to be worth anything, an invention must be an intricate matter, involving great technical knowledge, and discoverable only by very learned people; and, secondly, that to get a patent for an invention is a costly proceeding, taking a long time to obtain, and then only through the medium of patent agents and high fees.

Both of these ideas are utterly erroneous. It is possible to invent without being possessed of extraordinary ability, and it is easy and inexpensive to patent an invention if only inventors are willing to take a little trouble, and spend a little time in mastering the very simple rules which should guide them, and which it is the object here to put before them concisely and without technicalities, giving information which is reliable, as the outcome of some experience and of the consideration of decided cases.

It is, perhaps, not astonishing to learn that Howe and Singer both made enormous fortunes by their sewing-machines; the former deriving 100,000*l.* a year, and the latter dying worth 3,000,000*l.*; but the gentleman who "invented" the india-rubber tip to pencils (a not very wonderful idea) pockets the respectable sum of 26,000*l.*, while the inventor of those metal plates for the soles of boots and shoes had a quarter of a million sterling as the reward of his idea. The inventors of children's toys have realised sums which seem almost fabulous. "The dancing Jim Crow" (a not by any means ingenious toy) dances to the tune of 15,000*l.* per annum; while the revolving card-board disc, through whose slits one sees figures pass as if in motion (an old idea improved upon and called "the wheel of life"), proved a wheel of fortune, too, for the inventor spun a golden thread of 100,000*l.* by its means.

These are only a few of "the happy thoughts" which have proved veritable gold mines to those to whom they have occurred, and who have been wise enough to patent their ideas.

It is quite true that formerly it was a costly proceeding to obtain a patent, but, thanks to a recent Act of Parliament, an inventor may have a chance of securing a fortune by patenting his invention at a cost of only 4*l.*

Before describing how this can be done, it will be as well to define what a patent is.

A patent, then, is the exclusive privilege of making or working a new manufacture for a certain period, during which you, and you alone, are entitled to benefit by it, unless, of course, you choose to sell or transfer the patent right, which you can easily effect if you should be so inclined.

The next question to consider is what are the different kinds of inventions for which patents are granted? They are the following:

1. The making of some new article.
2. An improvement on some old article.
3. An improved method of making some old article.
4. The discovery of some useful principle and the practical application of it.
5. A new method of producing some useful quality in an article.

As a rule, invention takes the form of an improvement upon some old article or upon the process by which it is manufactured, and this improvement may consist of the addition of something new or the combination of two or more old well-known articles, but which are applied in some novel manner. Any invention is patentable by which an article is made better and cheaper than by the old method. As an illustration of an improved method, mention may be made of Macintosh, who realised a large fortune by substituting india-rubber in a liquid state laid between two fabrics instead of coating the outside of the material with the india-rubber. A patent will be granted for a cheap method of making a well-known article; thus, Mr. Young discovered that paraffin oil could be readily and cheaply manufactured from bituminous coal,—patented his process and made a fortune, notwithstanding the fact that the chemists had, years before, been in the habit of manufacturing paraffin oil, but by a tedious and ex-

pensive process. In a word, the principle may be as old as the hills, so long as your application of it is new. Two other points about inventions: it is well to bear in mind that they must be new, and they must be useful. In other words, you must not let the public use your invention, and then try to take out a patent for it, for you will be met with a refusal from the Patent Office. But this applies only to a public use of your invention; and there would be nothing to prevent your openly experimenting, or even allowing a friend to test your invention in his manufactory, say, for a month, to see if it really is a good thing, prior to your applying for letters patent.

The Patent Office does not, indeed, trouble itself about the ability or non-ability of your invention, but it is obvious that it would not be worth while to patent an article not superior in any way to one of the same kind already in the market, or to patent a process which is neither more rapid nor cheaper than the one it seeks to supplant.

As far as obtaining a patent is concerned, it matters not if your invention is the outcome of years of study and experiment, or the result of a sudden inspiration, or even of the merest accident. In fact, in the history of inventions there are numerous instances where the happy idea, which has brought fortune along with it, was, in its inception, nothing more than some "dodge" to save time and trouble, or a substitute for something which was wanted, but not at hand.

Having thus briefly indicated what can be patented, the next point to consider is,—Who can apply for a patent? To this the answer is,—The true and first inventor or his legal representative, neither of whom need be British subjects. Nor need the inventor have actually discovered the invention, for so long as it has been hitherto unknown in the realm, he may be simply the importer of it from a foreign country. But here take note that "unknown in the realm" includes all places under English rule. Where the invention is the outcome of two or more persons working together, each of them will do well to see that the application for the patent is made in their joint names, for it has happened before now that application has been made by one of a set of inventors who, getting the patent in his name, has left his co-workers out in the cold and without redress.

We now come to the *modus operandi*,—the method of obtaining a patent. All forms and stamps required can be obtained at any money-order office in the United Kingdom. A copy of the Patent Office Rules, with a list of all necessary forms, can be obtained from the Comptroller-General, Patent Office, 25, Southampton-buildings, Chancery-lane, London, post free for sevenpence; and to him address all subsequent communications. Having got your forms, the first one you will fill up is the application. This is how it runs:—

"I, \_\_\_\_\_, do solemnly and sincerely declare that I am in possession of an invention for \_\_\_\_\_; that I am the true and first inventor thereof, and that the same is not in use by any other person or persons, to the best of my knowledge and belief; and I humbly pray that a patent may be granted to me for the said invention. And I make the above solemn declaration conscientiously, believing the same to be true, and by virtue of the Statutory Declaration Act, 1835.

Declared at \_\_\_\_\_, the \_\_\_\_\_ day of \_\_\_\_\_, 1888.

Before me,  
A Commissioner to Administer Oaths in the  
Supreme Court of Judicature."

The blanks in this form of application are filled in thus:—First, the name in full of the inventor; second, the title of the invention; third, the place and date of application. When the form has been filled in, you must take it to a solicitor who is a Commissioner to administer oaths; he will sign the form after you have signed it, for which he can claim 1*s.* 6*d.*, and no more. There is not much difficulty to contend with so far; in fact, the only part of the application which need trouble you is the title or descriptive name of your invention. A few simple rules will help you over this difficulty. In your title you need not go into particulars,—that you will do in your "specification." You must take care not to claim for your invention more than it can accomplish; for instance, a patent for a machine would be void if, claiming to cut leather, copper, and steel, the machine would not cut steel, although it cut leather and copper to perfection. Remember, too, that if your "specification" claims more for your invention

than your title does, your patent would be void. With very little thought you will be able to give your invention a proper name, and here is a useful hint. The Patent Office in London, and the free library in most large towns, contain a complete set of the Patent Office books. Run your eyes over one of these, and you will soon see how to describe your invention, for there are lists of thousands of inventions. The Patent Office, 25, Southampton-buildings, Chancery-lane, London, will send you a list of towns where these books may be seen if you send 2*d.* to the Comptroller, requesting that a list may be sent you.

When you have filled in your application form to your satisfaction, and got it signed by a Commissioner to administer oaths, you must fill in your specification form. This is not a very difficult matter. The specification is a description of what your invention is and how it is worked.

Begin it with the title, which must be worded the same as the title in the application. If you cannot clearly describe your invention without drawings, put drawings in. Then sign and date your specification (you must make out two copies of it). Now you must get a 1*l.* stamp at the money-order office, for this is the fee payable on application for a patent, put your application form and your two specification forms into an envelope directed to the Comptroller-General of Patents, 25, Southampton-buildings, Chancery-lane, London.

This obtains for your invention a provisional protection for nine months, during which time you have the sole right to benefit by it. Before the nine months expire you must send the Comptroller what is called a complete specification,—this is nothing more than the old specification elaborated, for it should contain more details, and go more fully into the way of working the invention, and it should contain any improvements you may have made during the nine months which have elapsed since you sent in your first specification. You must be careful in your complete specification to explain every step in your invention fully and clearly, just as if you were describing it to a very ignorant workman, so that he could, after hearing your description, go away and make the article, or apply the process without having to come to you for further instructions. Start by stating the object of your invention, fully and clearly, using as many words as you like; then go on to state how you effect the object, giving every detail, and describing the best way you know of, taking care to omit nothing that can in any way assist in the perfect working of the invention.

During this elaborate description you will, of course, have mentioned many things which are neither new nor discovered by you, but which are necessary to the proper working out of your idea; so now is your time to state what is new in your invention, and you can best do this by saying, "This or that, though necessary to the working out of my invention, I do not claim as new," and then go on to say, "But what I do claim is so-and-so," stating exactly what you do claim as new. Here, again, a glance at some of the Patent-office publications will assist you, as you will see the style in which specifications are written. Frame your own on the same model. The fee payable on the grant of a complete specification is £3; this, together with the fee of £1 already paid by you, makes £4 in all, and this represents all the fees you have to pay to obtain your patent. Four years after the grant of your patent you will be called upon to pay 10*l.*, or you will lose your right. 10*l.* a year is also payable for seven years after this, then 15*l.* a year till the ninth year, then 20*l.* till the thirteenth year; but, of course, none of these fees are payable should you not think it worth your while to keep up the patent; and it remains to add that when the complete specification has been granted, the Comptroller advertises the acceptance of the provisional and complete specifications, and informs the public that these documents will be open to inspection for two months. This is to give an opportunity to any one to file a declaration opposing the grant of the Letters Patent on some valid ground, for example, that your invention has already been patented in this country. The opposition takes the form of an action, the Comptroller sitting as judge, there being an appeal from his decision to "The Law Officer."

You can make yourself pretty safe with regard to any chance of opposition by making a search



the lists of patents contained in the carefully-compiled books at the Patent Office, and which are supplied to most large towns by the Patent Office; indeed it is always wise to make a search, so that you may feel sure that your idea has not struck somebody else, who has been first in the field and has got his patent

## THE NEW RIVER AND A SEVENTEENTH-CENTURY "PROMOTER."

—“I dwell, sir, at the sign of the Water Tankard, by the Green Lattice.”—*Every Man in his Humour*, 1633.

ON June 19 last, in one of our reviews, *Architecture at the Royal Academy*, we noticed Mr. J. Crowther's excellent water-colour drawing, No. 1,862, of the interior of the New River Company's "Oak Room," at Clerkenwell, and we published last week an illustration of Mr. Crowther's picture. The room in question appertains to the older portion of that company's offices at the New River Head, in James's parish. It was fitted up *temp. William III.* by the then clerk to the company, John Grene, who had married Elizabeth, daughter of Sir William, son and heir of its founder, Sir Hugh Myddelton. The wood-work, as we said, is believed to be, and very probably is, the workmanship of Grinling Gibbons. The decorated ceiling of an adjoining chamber, which is known to have been erected by Grene at the same time, bears date 1712. In this chamber is deposited an interesting model, to scale, of the London area which is served by the company's system. The model made as an exhibit in the Hydraulic and Water-supply Section of the recent Health Exhibition at South Kensington. The original plans, considerably altered and enlarged in time to time, were formerly occupied, it is said, by Myddelton himself. Since his day it has been the customary for the chief officers to reside in the "Oak Room," one of them being Robert Mylne, the architect and civil engineer, to whom we will presently advert. Hollar's small etchings of the room are doubtless familiar to some of our readers. Of the house in Myddelton's time, there are two stories, and a high roof with attic, and a range of four columns on the ground-floor, open land, by Antonio Canaletto, 1753, saved by Stevens. In the Grace Collection, at the British Museum, are T. H. Shepherd's water-colour paintings of 1852, showing this house as it appeared in 1689, and the new house as it appeared in 1851. Certain private and the public collections include many similar views. In the company's court-room hangs a large print of the buildings in 1720, depicting the old offices, the basin, pond, and works. In the foreground is a raised-in reservoir which now occupies the site of the Claremont-square, Portico. The "Oak Room," as it was termed, which, in former times, lay next northwards of the basin, and (since enlarged, lined with brick, &c.), from which it was formerly separated by a wall, has been replaced by flitting beds. One may yet see the actual mound, close to the arch opening from the river into the basin, at which Myddelton stood with legitimate pride on Michaelmas Day, 1613. In the presence of Lord Mayor Sir John Swinerton; his own brother Thomas, who, that same day had been chosen Lord Mayor-elect; together with other worthy company, the generous stream from Chadwell and Amwell springs for the first time "ran gallantly," as Stow, in exultant mood, describes, "into the cistern, drums and trumpets sounding in triumphal manner, and a brave company of chambers gave full issue to the intended entertainment." That event is commemorated by George Bickham's print. The cistern had a ducking-pond—"an open, idell pool," at Maitland. Moreover, the basement storey remains of the ancient "wheel house," a low tower, that once carried a windmill, so conspicuous an object in the river views by Chuteau, Woodward, Bowles, Green, and other artists, of the open country which then stretched beyond Spa and Coldbath Fields and Clerkenwell-green. The Head lies just above the Thames.

Robert Mylne, F.R.S., the architect in presence to Gwyn of old Blackfriars Bridge, and

of "Almack's," since Willis's Rooms, in St. James's, was for several years surveyor—"Architect and Paymaster of the Works"—to the Dean and Chapter of St. Paul's, as well as to the New River Company. Mylne, to whom we owe the ever memorable "Si monumentum requiris, circumspice," died, aged seventy-eight, on 5th May, 1811, and was buried in the cathedral crypt. There, ten years later, John Rennie, who designed London, Southwark, and Waterloo bridges, was laid by his side. In 1782 he restored, as the engineer's house, the buildings of 1613, and rebuilt, in Dorset-street, Blackfriars, the old offices which, with voluminous records, were burnt on November 24, 1769. The Company used to hold their earlier meetings in taverns. The Blackfriars offices were let, *circa* 1820, to the City Gas Company. Robert Mylne's son, R. Chadwell Mylne, F.R.S., born 1781, succeeded to his father in the New River Company's service; and continued to hold office until, as we gather, his death at Amwell, in December, 1853. He it was who designed and built the engine-house and new machinery at New River Head, together with that by the extensive subsidence beds and reservoirs at Stoke Newington. He was buried in the family vault in St. John-the-Baptist churchyard, Great Amwell, where the epitaph says that for "upwards of half a century he had the care and management of the works of the New River, and the same period was Surveyor to the Stationers' Company."

Our rapid age of multifarious and eager enterprise cannot easily realise the extent and nature of the obstacles that well-nigh prevented Myddelton from accomplishing his great work. In Queen Elizabeth's reign an enabling Act had passed (1580) whereunder the citizens were empowered to bring supplies of water from the Hertfordshire springs. They made no move in the matter. Householders rested content with their apprentice's tankards, pumps, wells, and running conduits; and with one or two "Water Houses," such as Peter Maurice's at London Bridge (1582) and Bevis Bulmer's, near to Queenhithe (1594), which supplied but limited areas. They proved to be equally supine after the passing of a statute to the like intent in 3 James I., and an explaining Act of the following year. Sir Hugh then, in 1609, applied himself to the task, buying the City's interest in the undertaking. Thwarted in every direction, and violently opposed by the landlords along his route, he was almost a broken man when he had carried his works along the Lea valley past Theobald's and Chase wood to Enfield. Having in vain sought help from the Common Council, he turned to the King. James agreed to contribute one-half, being 7,437l. 4s. 11½d. of the expenses, taking in recompense one moiety, or nineteen shares of the estate. This was ratified on May 2, 1612. Hence the designation of King's Shares. In 1619, Myddelton, for 100l. a year to him and his heirs, made over his property in the venture to a company incorporated in that year, whereof he was nominated first governor, the Sovereign being precluded from taking active part in the management. A first dividend of 11l. 9s. 1d. per share was declared in 1633, the next dividend was but 3l. 4s. 2d., and inasmuch as in lieu of a third profit it was contemplated to make a call, King Charles I. took alarm, and offered to exchange his holding for an annual charge of 500l. upon the net proceeds. That charge was afterwards settled by William III. upon his friend the Earl of Albemarle for ever—as Hatton avers he is credibly assured. Upon the re-conveyance (1696) the governors sub-divided the King's moiety into thirty-six shares, and made a like sub-division of the remainder, that is to say, of the Adventurer's shares. These, in Hatton's time (1708) were assessed at 4,500 gs. each. The high premiums to which the stock has since attained will in all likelihood advance to a higher sum still, since some twenty years hence a large amount of rack rentals derived from the neighbourhood will fall in to the proprietors. The dividend on each freehold share for last year exceeded 2,600l. Myddelton, who, it seems, did not the while neglect his trade as a goldsmith in Basinghall-street, was knighted by the King, and in 1622 created a baronet, with remission from the usual fees. Two years before he had succeeded in reclaiming the inlet of Brading harbour, Isle of Wight, from the sea. In 1624 his superintendence ceased, and through neglect the works were gradually destroyed by the sea. In 1617 he enriched himself by clearing water from some lead and silver mines which he leased near to Plynlimmon. The sixth son of Richard, of Galchill, governor of Denbigh Castle and scion of

a good old Welsh stock, he died, according to some accounts, on December 10, 1631, by no means, as is commonly reputed, a poor man; though applications for aid were subsequently preferred to the company by his kindred. On December 21, 1631, his widow and executor proved his will, in London. Janssen painted his portrait—a gift from the widow to the Goldsmiths' Company. To his memory Robert Mylne set up, in 1800, a pedestal and votive urn on the larger islet in the stream at Amwell, and marble statues have been erected in the Royal Exchange (by Carew), and at Islington-green. The latter, by Thomas, and given by Sir M. Peto, was uncovered by Mr. Gladstone, on July 26, 1862. They who incline to poetry may like to be reminded that the poem of "Amwell," written by the Quaker, John Scott (born 1730), of Ware, contains numerous allusions to the New River as it flows in placid meandering course for about forty miles into London.

## HESTON AND ISLEWORTH MAIN SEWERAGE.

THE drainage of this district, which comprises the towns of Hounslow, Isleworth, and Heston, is proceeding apace. The works will cost about 80,000l., and were commenced in August, 1887. The scheme is that of Mr. Walter B. Bromley, Engineer to the Local Board, and we believe that it was mainly through its presentation at the Government inquiry held at Kingston-on-Thames, five years ago, that the district of Heston and Isleworth was allowed to be severed from the Lower Thames Valley Main Sewerage Board.

The main sewers, which are being laid by Mr. Jas. Hayward, of Eastbourne, consist of 30-in. pipes. The population is about 25,000, and the sewers are all calculated to discharge 45 gallons per head of the population in twelve hours, being the quantity adopted by the Lower Thames Valley Board. The scheme is being carried out on the "separate system," the sewage being taken to the land and the rain water to the watercourses and river. This system has been adopted so as to lessen the first cost of the sewers, and to reduce the after or annual expense to a minimum. The sewers will take all soil, sink, stable, and yard or other water, and the surface-water drains will carry off the rain-water. The district is divided into two parts, the high and the low, or water-logged portion. The high-level outfall sewer is calculated for 66,000 head of population, and the low-level for 20,000, being a total of 86,000 or three and a half times the present number of inhabitants. The high level is the Heston and Hounslow portion, and the water-logged that of Isleworth, Brentford End, and St. Margaret's. From the high-level the sewage will run by gravitation to the outfall at Mogden, but from the low-level it will be pumped up by Shonck's pneumatic ejectors. There are twenty-six miles of sewers, and the pipes are Hassall's safety joint, which are being most successfully laid in water, and without which the work could not be done without sub-soil drains, so much water being met with. At the outfall the sewage will be treated by chemical precipitation, and the works, which are being constructed by Messrs. B. Cooke & Co., of Battersea, are almost complete. The sewers will probably be finished in six months' time, and the works will be ready for house-connexions in about eighteen months.

**Metallurgical Department, King's College, Strand, London.**—We are asked to state that there are three or four free admissions to the Laboratory and to the lectures obtainable through the City and Guilds of London Institute for the Promotion of Technical Education. Inquiries may be addressed direct to Prof. Huntington, at King's College. Work commences this week. The course of lectures is designed for all those who in any way have to do practically with the applications of metals. It treats of the principles of the methods by which metals are obtained from their ores, and the means by which they are rendered suitable for the various requirements of the arts. Special attention will be devoted to the metallurgical requirements for the Technological Examinations of the City and Guilds of London Institute in metal plate work, plumbing, iron and steel, and for the Whitworth Scholarships and Science and Art Department Exhibitions. We are informed that the instruction given to each student in the Laboratory is regulated by his special requirements.





## TOMBSTONES NEAR PETERBOROUGH.

THE accompanying drawings of tombstones are traced from careful pencil drawings made on the spot by Mr. Irvine, the present Clerk of Works at Peterborough Cathedral. They are examples found in that part of the country, and two of them present a peculiarity of design which will be at once recognised, and which seems to be characteristic of the district; the recumbent figure is seen as if covered by a mantle, which conceals all but the head and shoulders. In the example from Castor Church (south transept) the covered portion is left perfectly plain; in that from Wittlesea St. Mary, it is decorated with a fine flowering cross. In this example, it will be seen, the feet (only one of which remains) are also shown protruding from the bottom of the coverlet, as we may call it.

We saw the sketches when looking over the work at Peterborough with Mr. Irvine recently, and thought them of sufficient interest to ask leave to reproduce them, which Mr. Irvine readily gave. His drawings were in pencil, and would not have reproduced satisfactorily; we have accordingly had tracings

made from them, and the sections are drawn out to scale from Mr. Irvine's figured profiles.

## Illustrations.

## HOUSE ON THE SEVERN.

THIS view and plan of a small riverside house, by Mr. C. E. Mallows, is from a drawing by the architect, which was exhibited at the Royal Academy this year.

The house is about to be built on an unusually picturesque site near Upton, Worcestershire. The principal feature of the plan is the large hall and staircase, around which are grouped the reception-rooms. The upper floors contain fourteen bed and dressing rooms, bath, lavatories, and stores for linen, &c.

Local stone of a reddish colour will be used for the principal fronts, the green slates for the roofs; tile hangings and red brick for other parts.

We give a reproduction of the drawing on a larger scale than the architectural importance of the house itself might seem to warrant, in justice to the very artistic spirit of the drawing as a whole.

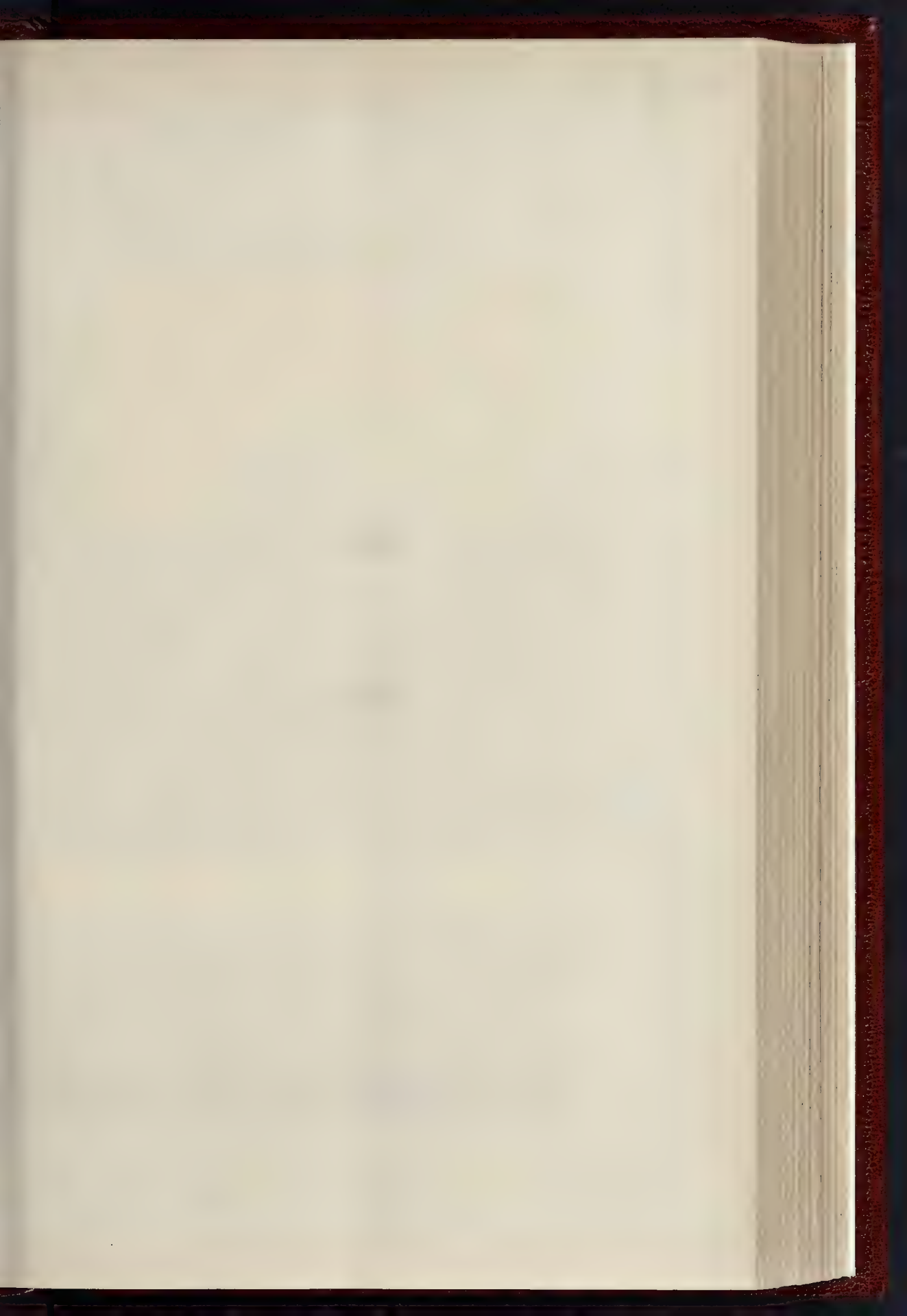
## GREAT INDIAN PENINSULAR RAILWAY TERMINAL BUILDINGS, BOMBAY.

We give this week the principal elevation and views of different portions of this building, one of the largest which has been erected in India from the designs of an English architect.

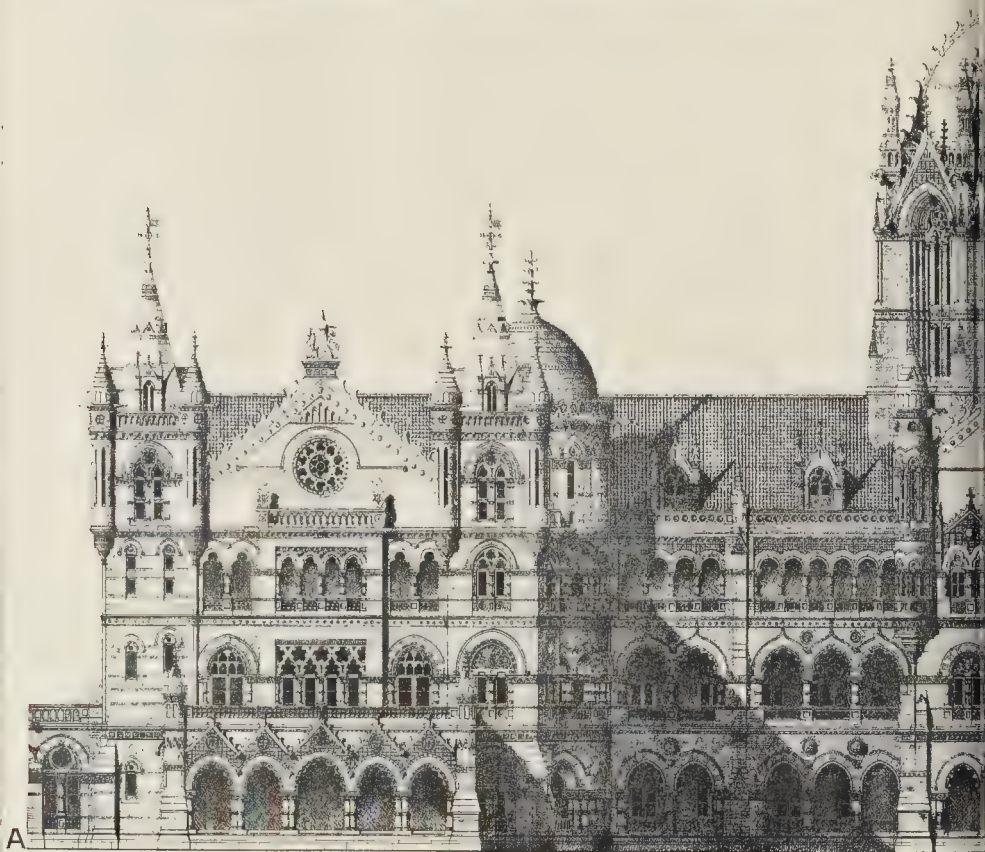
In the *Builder* for October 23, 1886, we gave a view of the large Waiting Hall, and of the entrance-corridor to it, and some illustrations of the sculptural decorations; and in the same number we gave a pretty long description of the building and the materials employed, from information furnished by the architect, Mr. H. W. Stevens, from whose designs and under whose supervision the buildings were commenced in 1879.

We have little to add to the description given along with our former illustrations. The figure sculpture has been executed in London by Messrs. Harp & Son, and includes a colossal figure of "Progress" on the summit of the dome (seen in one of the views). The large gables on the south and west sides are surmounted by groups on pedestals representing Engineering, Commerce, and Agriculture, and the statue of the Queen-Empress has been placed



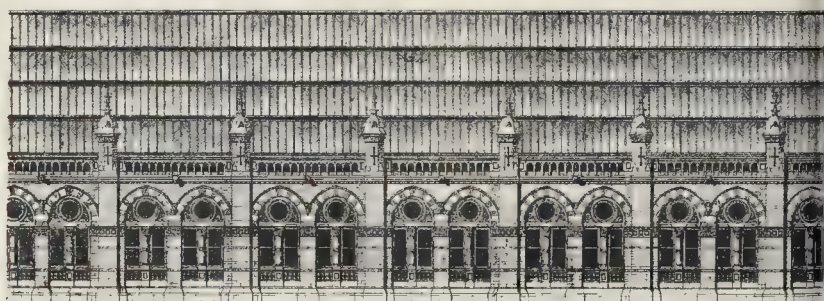


• GREAT • INDIAN • PENINSULAR • RAILWAY • VICTORIA • TERMINUS •  
• AND • ADMINISTRATIVE • OFFICES • BOMBAY •



Scale of Feet

FRONT OR





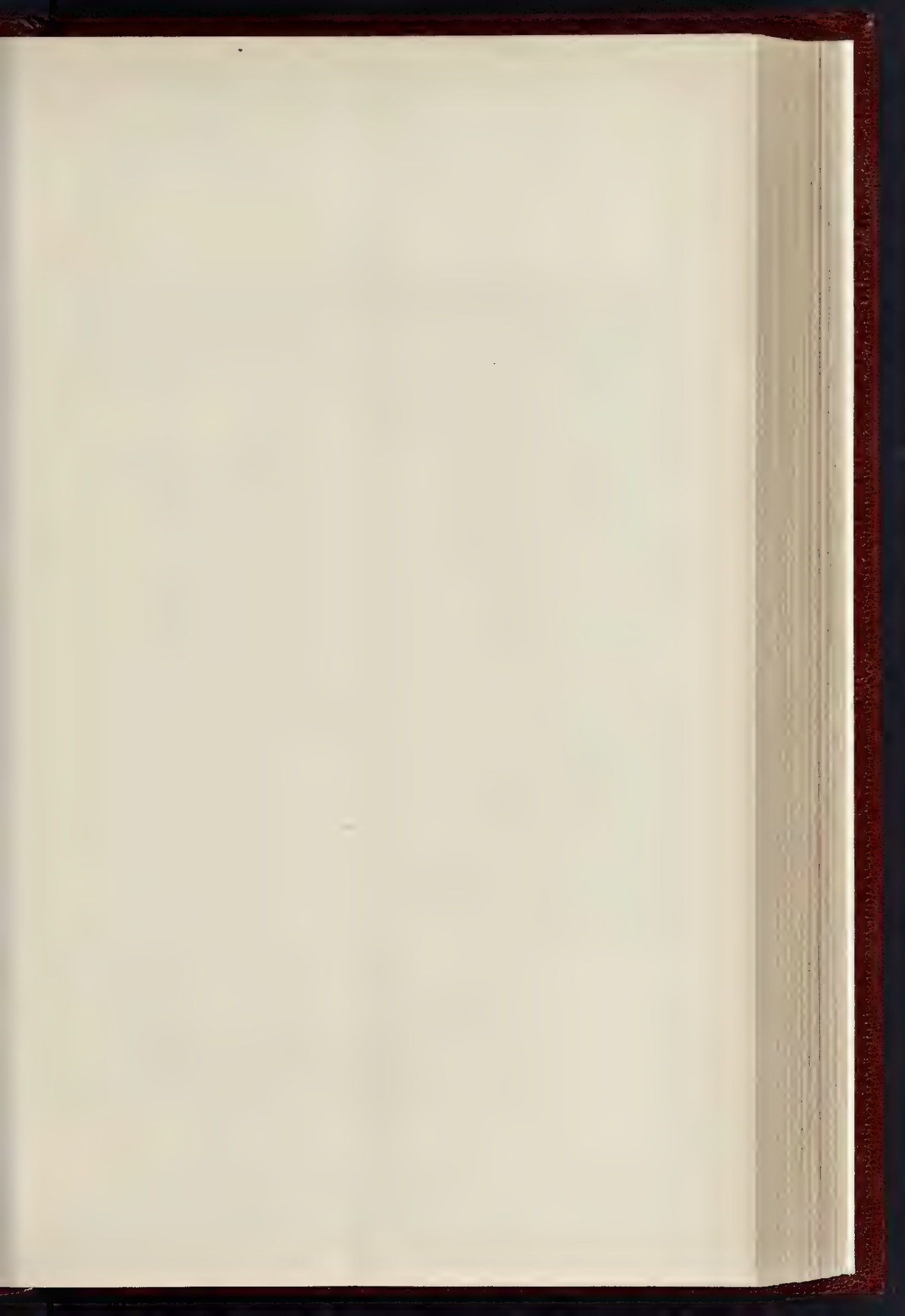


*Robert W. Kent*

FRANK BRIDGE



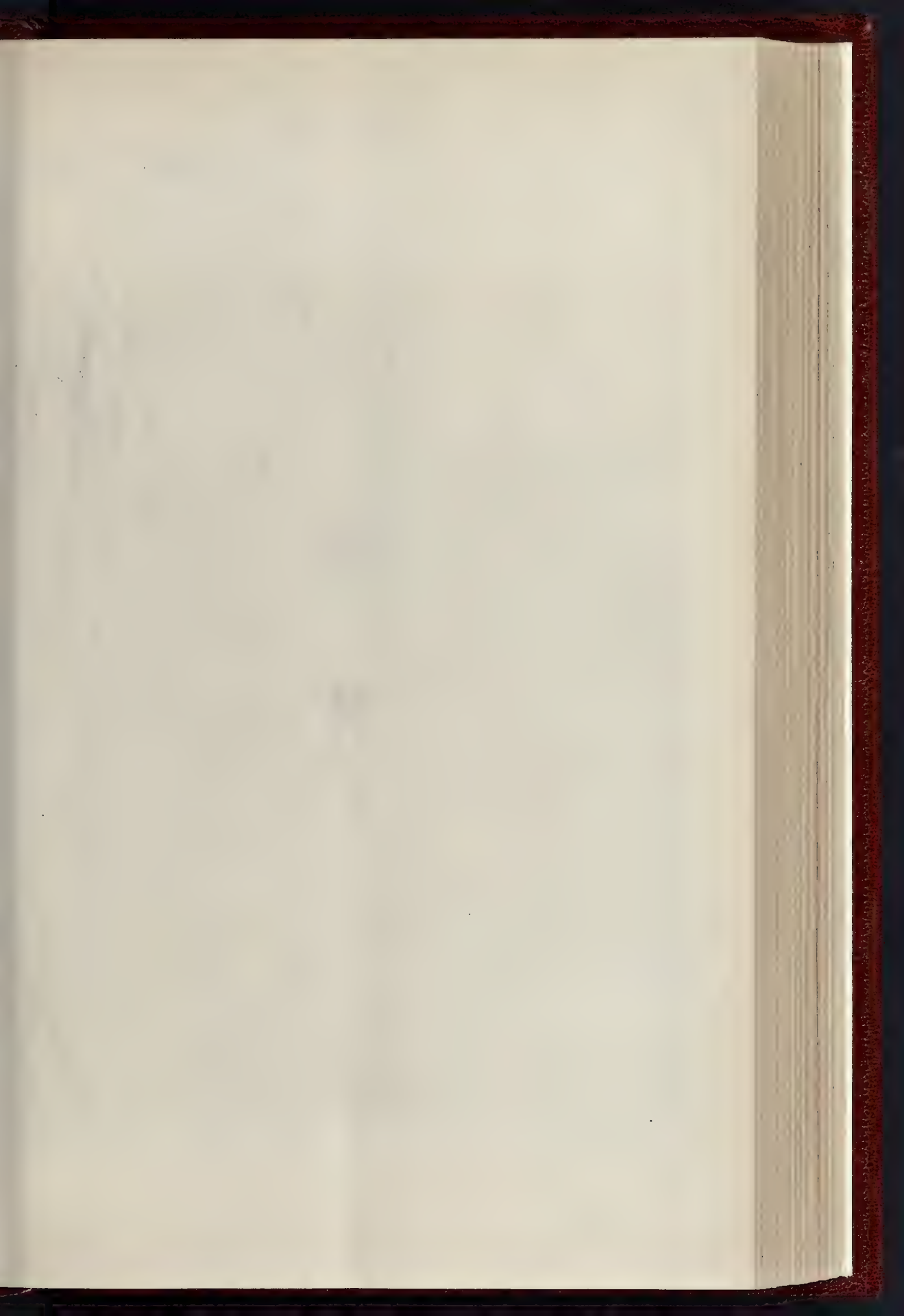




THE DUJLER OCTOBER 13, 1889



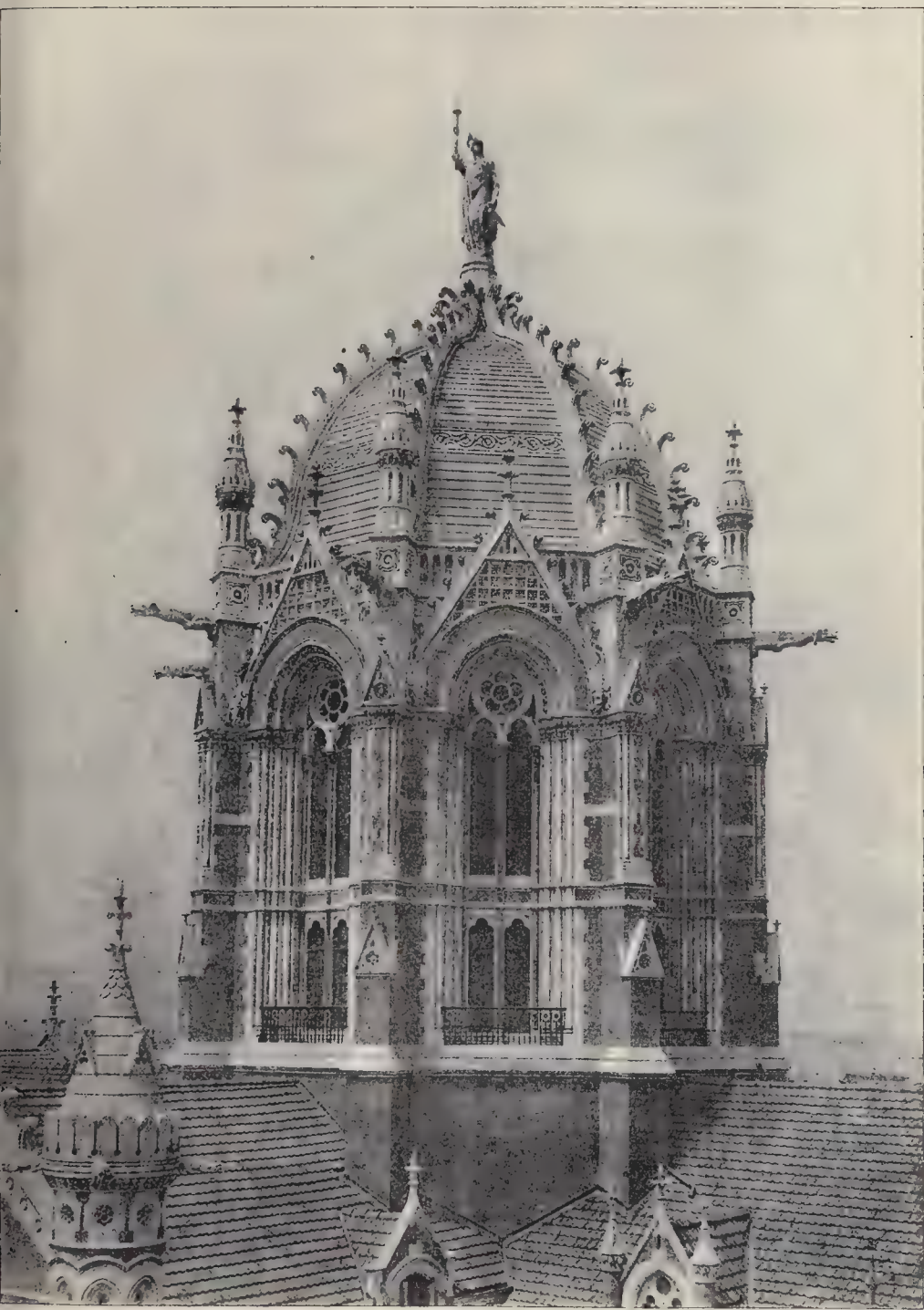






INDIAN PENINSULAR RAILWAY TERMINAL BUILDINGS, BOMBAY.—MR F. W. STEVENS, F.R.I.B.A., A.M.I.C.E., ARCHITECT  
VIEW OF CENTRAL FEATURE.





INDIAN PENINSULAR RAILWAY TERMINAL BUILDINGS, BOMBAY.—MR. F. W. STEVENS, F.R.I.B.A., A.M.I.C.E., ARCHITECT.  
PRINCIPAL DOME.



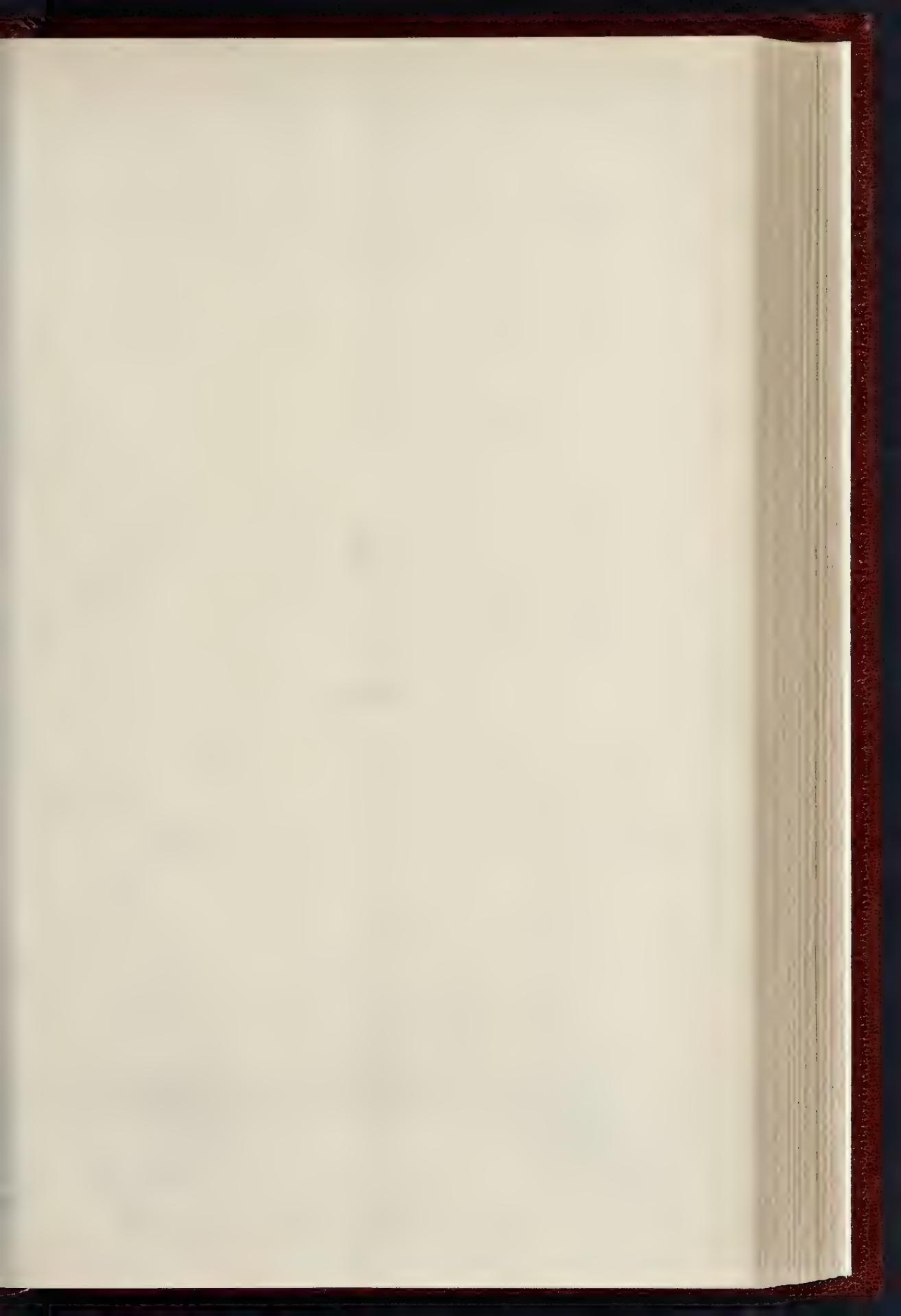




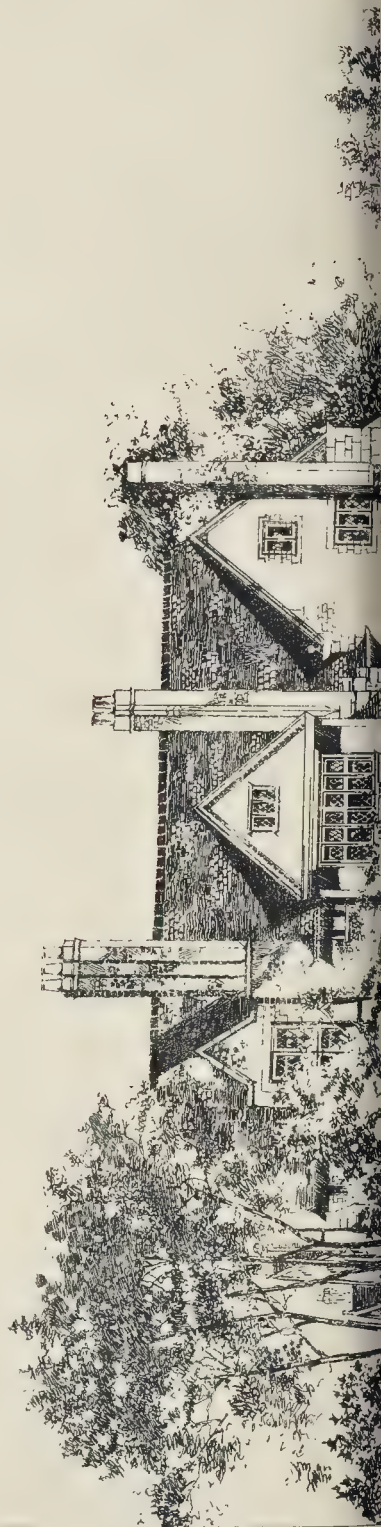
INDIAN PENINSULAR RAILWAY TERMINAL BUILDINGS, BOMBAY.—MR. F. W. STEVENS, F.R.I.B.A., A.M.I.C.E., ARCHITECT.  
VIEW OF ENTRANCE UNDER PRINCIPAL CARRIAGE PORCH.



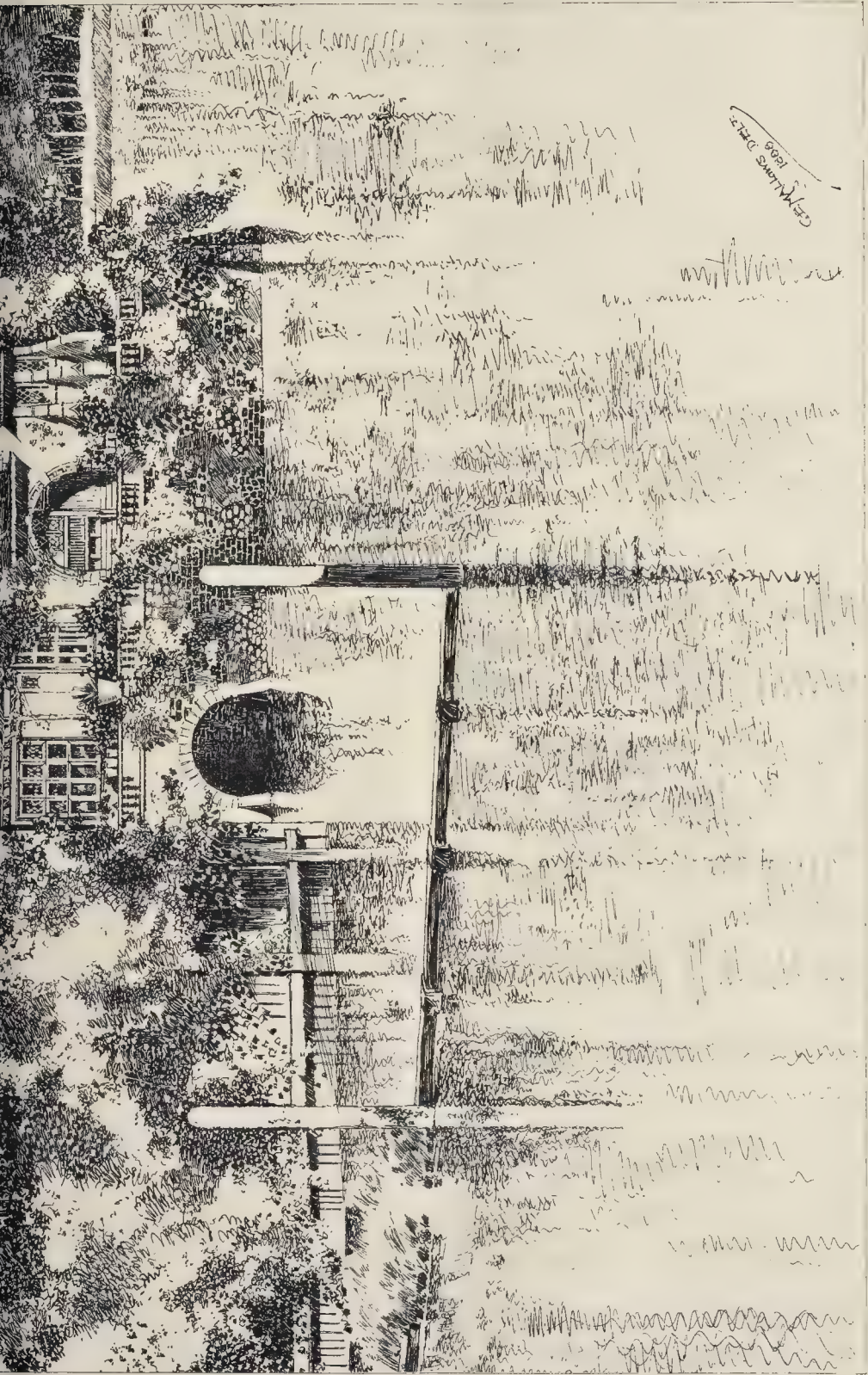




THE BUILDER, OCTOBER 13, 1888.

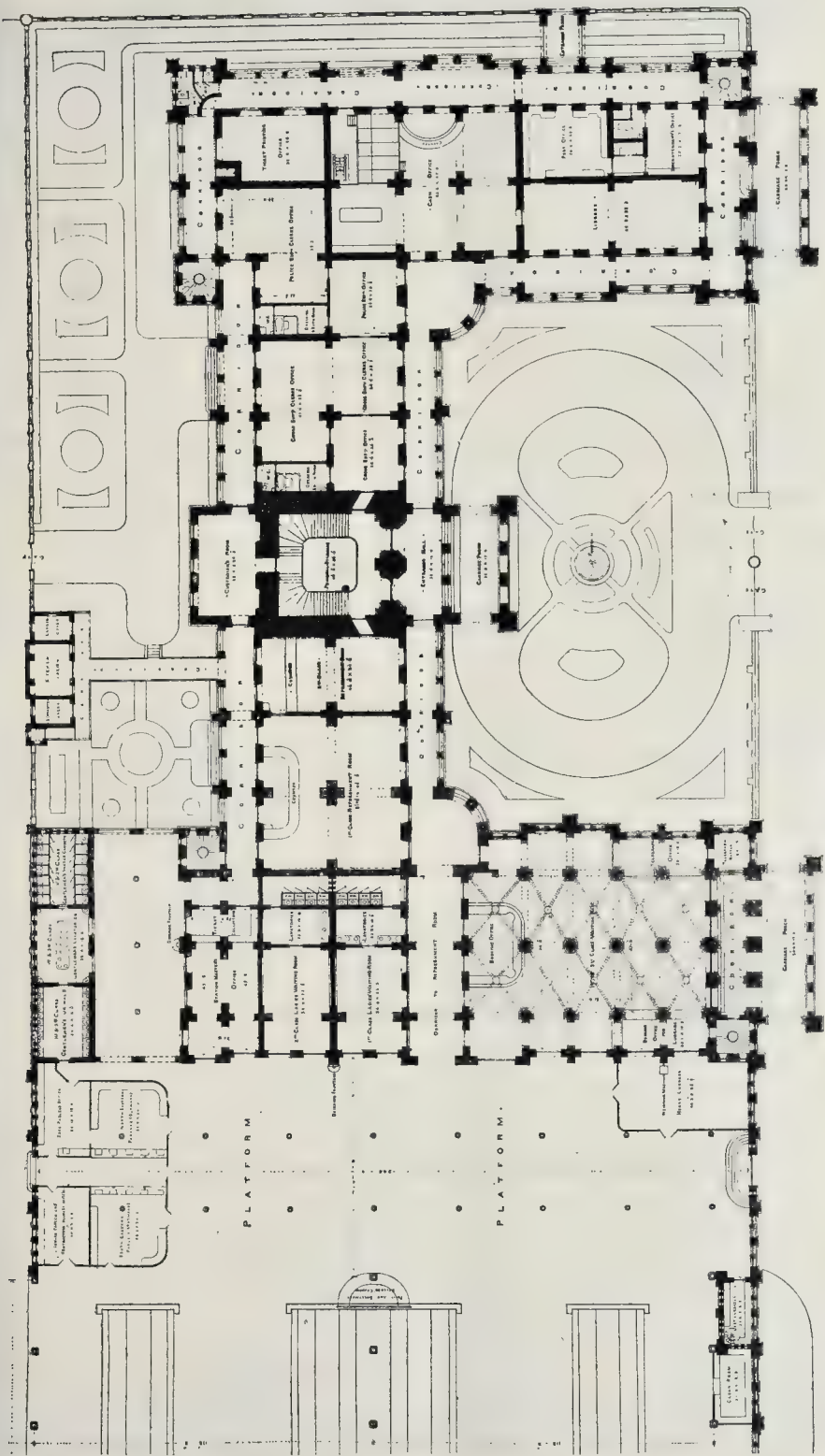












Great Indian Peninsula Railway Terminal Building, Bombay.—Plan.

under the canopy below the large clock of the central gable. A separate illustration of this statue will be found in the *Builder* for Sept. 10 of last year, page 362; and in a lithograph in the same number will be found reproductions, from photographs, of the figure of "Progress," and the other allegorical sculpture above referred to. In the *Builder* for October 23, 1886, we gave also a lithograph of some of the decorative carved detail, executed by native carvers from models supplied and designed by Mr. Gomez and the students of the Bombay School of Art, and which are among the best portions of the decorative work.

The buildings are faced with a light buff-coloured Coorla stone, with dressings, cornices, mouldings, &c., in Forebunder and Seoni stones. The total cost of the whole of the buildings was about twenty-seven lacs of rupees. All the work was entirely executed by native labour, entirely to the satisfaction, we understand, of the architect. For further particulars we must refer the reader back to the *Builder* of Oct. 23, 1886, page 608.

We have devoted several pages of illustrations to this building, as it is one of the largest and most important modern buildings erected under European influence in the Indian Empire, and we have thought it well to give our readers the opportunity to form an opinion, as far as may be done from illustrations, as to the architectural merits of a building which has, apparently, received great admiration in the regions of Anglo-Indian criticism.

#### THE OPENING CONVERSAZIONE OF THE ARCHITECTURAL ASSOCIATION.

The commencement of what may be termed the "architectural session" in London was heralded by the opening *conversations* of that vigorous body, the Architectural Association, which took place on the 5th inst., at the Westminster Town Hall. There was a numerous attendance of members and ladies, but the rooms were not inconveniently crowded. The energetic President, Mr. Herbert D. Appleton, F.R.I.B.A., assisted by the honorary secretaries and the committee, received the company, for whose delectation a large number of drawings and other exhibits were on view.

Among the drawings exhibited in the large room on the first floor, were those for which the Architectural Association Medal and 10*l.* 10*s.* were awarded to Mr. Banister F. Fletcher, bearing the motto "Crowberry," and showing a design for stables to a country house. The design was Early French Renaissance in style, simply and severely treated, and the buildings were placed round a courtyard. The drawings by Mr. E. L. Lutyens, bearing the motto "Simplex et Prudens," and which obtained "honourable mention," were also on view. For the Architectural Union Company's Prize there were two competitors, the first place being awarded to Mr. Sidney Tugwell for his measured drawings, bearing the motto "Yorkshire." For the Neale Prize there were five competitors. The prize was awarded to Mr. S. Greenisade for his admirable drawings of Elm Church, near Wisbech. In the same competition honourable mentions were awarded to Mr. H. Tooley (for drawings of Worstead Church, Norfolk) and Mr. A. C. Walker (for drawings of Barfreston Church, Kent). The Edis Prize attracted seven competitors. The prize was awarded to Mr. A. Cladding.

Judging from the fact that there were eight competitors for the "Essay Prize," the literary faculty seems to be making way in the ranks of the members. On the table was the MS. of an essay bearing the motto "Olaf," by Mr. H. Tooley. It consists of a description of Worstead Church, Norfolk, and was awarded the Association's silver medal and 10*l.* 10*s.* An extra bronze medal and 5*l.* 5*s.* were awarded to Mr. W. Wonnacott (motto "Jessamine") for his essay on "Timber Roofs." Honourable mention was awarded to the essay bearing the motto "Saxon," by Mr. A. A. Cox, being a description of Canterbury Cathedral.

Mr. J. L. Robinson, of Dublin, contributed a series of photographs taken by himself in illustration of the recent excursion of the Association to Matlock and the neighbourhood.

In the next room there was a collection of water-colour drawings, including some by Mr. W. Medlicott, Duke (Aldwinckle Travelling Student, 1887). Mr. Duke's productions were very good, notably a view of the market-place at Verona, and a view in Rouen with the Cathed-

ral in the distance. Mr. A. H. Hart also contributed some exceedingly good water-colours. Other exhibitors in this line were Messrs. R. Phené Spiers, Aston Webb, H. O. Cresswell, E. H. Selby, A. B. Mitchell, C. E. Mallows, P. Thornhill, Francis Miller, and Gerald Horsley. A number of plates from the Association's "Sketch-book," and designs for the "Sketch-book" title-page (the successful competitor being Mr. W. G. B. Lewis), were also on view.

In an adjoining room were exhibited the drawings made by the members of the Elementary Class of Design, the Class of Ornament and Colour Decoration, and the Elementary Class of Ornament and Colour Decoration, the last-named being a new class started under the presidency of Mr. Cole A. Adams, and remarkable for the high character of the work done. In fact, the best exhibits of drawings from the Classes were made by the two "Colour Classes." Especially good were some of the studies of natural colour in foliage and feathers.

In the further room were exhibited the drawings by Mr. D. J. Blow (first prize), C. O. King (second prize), and J. E. Jefferson (honourable mention) in the Class of Design.

The following is the complete prize list, as announced by the President during the evening:—

*Architectural Association Studentship.*—Awarded to Mr. D. J. Blow; Second prize awarded to Mr. R. D. Warry, Aldwinckle Travelling Studentship. Awarded to Mr. H. V. Lanchester.

*Architectural Association Medal.*—Awarded to Mr. B. F. Fletcher. Honourable Mention made of Mr. E. L. Lutyens.

*Architectural Union Company's Prize.*—Awarded to Mr. S. Tugwell (See and prize not awarded).

*Blushill Prize.*—No competitors.

*Cotes Prize.*—Awarded to Mr. A. W. Hennings.

*Ernest Turner Prize.*—Awarded to Mr. A. W. Jarvis.

*Elitistery Class of Design.*—Section I.—First prize awarded to Mr. A. E. Habersham. Second prize to Mr. P. G. Rede. Honourable mention made of Messrs. H. A. Saul and C. H. Strangé.

*Section II.*—First prize awarded to Mr. A. W. Jarvis. Second prize to Mr. C. Bywater. Honourable Mention made of Mr. B. A. J. Bidwell.

*Elementary Class of Construction.*—First prize awarded to Mr. A. W. Cleaver. Second prize to Mr. F. H. Greenaway.

*Elementary Class of Ornament and Colour Decoration.*—First prize awarded to Mr. C. S. Haywood; Second prize to Mr. V. T. Jones; Class prize awarded to Mr. V. T. Jones.

*Class of Design.*—First prize awarded to Mr. D. J. Blow. Second prize to Mr. C. O. King; Honourable Mention made of Mr. J. E. Jefferson.

*Colour Decoration Class.*—First prize awarded to Mr. H. V. Lanchester. Honourable Mention made of Mr. C. J. L. de Beaupré. Tunc Sketch prize awarded to Mr. C. J. L. de Beaupré.

*Class of Construction.*—First prize awarded to Mr. O. Oertel; Second prize to Mr. H. Ermerich.

*Advanced Class of Construction.*—Awarded to Mr. O. Fleming.

*Quantity Class.*—Awarded to Messrs. A. O. Breeds and G. Harvey (eq.).

*Sketch Book Title-page Prize.*—Awarded to Mr. W. G. B. Lewis.

*Veale Prize.*—Awarded to Mr. S. Greenisade. Honourable Mention made of Messrs. H. Tooley and A. C. Walker.

*Edis Prize.*—Awarded to Mr. A. Gladding.

*Book Plate Prize.*—Not awarded.

*Essay Prize* (with medal and 10*l.* 10*s.*)—Awarded to Mr. H. Tooley. Bronze medal and 5*l.* awarded to Mr. Wonnacott. Honourable Mention made of Mr. A. A. Cox.

*Lectures on History of Architecture.*—First and Second prizes divided between Messrs. F. M. Elgood and O. Fleming (eq.). Third prize awarded to E. Carless. Highly commended: Messrs. W. Pywell and J. Gehum.

*Lectures on Construction.*—First prize awarded to Mr. R. F. Taylor; Second prize to Mr. A. C. Walker. Third prize to Mr. H. E. Matthews. Honourable mention made of Messrs. E. Carless and L. J. Veit.

In the large hall, on the ground-floor, there were a number of exhibits of art manufactures, &c. Amongst them we may mention some very good "art tiles" by Messrs. De Morgan & Co., of Great Marlborough-street. Near to these was some delicate wrought iron work by Mr. Wilde. Messrs. Campbell, Smith, & Co. exhibited some excellent wall-decorations designed by Mr. Owen W. Davis, intended for the decoration of a house at Caen, in the Pompeian style. The same firm also exhibited the drawings of the decorative work carried out by them at the Alhambra, Leicester-square. Messrs. Hindley & Co. exhibited a good chimney-piece, &c., in white wood, with angle-nook and seats forming part of the design. Messrs. George Wright & Sons exhibited a pine-wood mantel-piece and over-mantel decorated in high relief with moulded ornament formed of a new material, which is neither *carton-pierre*, nor *lincrusta*, nor plaster of any kind. It is tough and difficult to injure, and a fairly good degree of sharpness of line is attainable by its use. This mantel-piece was *en suite* with a new pattern dog-grate in wrought-iron, the jambs and hearth of the fireplace being of Broughton tiles containing sepia-painted panels illustrating the "Devil's Bridge" and other subjects after Turner. The same firm exhibited a good

walnut mantel-piece and over-mantel, with stove, &c., *en suite*, and a couple of cast-iron mantels copied from prevailing wood models, and suitable for use in "Queen Anne" houses. Messrs. Jeffrey & Co. exhibited some of their new wall decorations, including a design with panels of Persian ornament, stated to have been suggested by work at the Taj Mahal at Agra, and designed for Messrs. Jeffrey by Mr. A. F. Brophy. The same firm also exhibited a wall decoration designed by Mr. Lewis F. Day, showing a frieze 30 in. in depth; in the Arabesque foliage of this design the emblematic subjects "Earth," "Air," "Fire," and "Water" are introduced in the form of medallions. The same firm also exhibited a "Free Classic" decoration designed by Mr. Hampden W. Pratt, and another design for a wall decoration, entitled "The Woodpecker," by Mr. Sydney G. Mawson.

The following is the syllabus of the papers, &c., to be read at the ordinary meetings for the new Session 1888-89:—

October 10.—President's Address, By Mr. H. D. Appleton.

November 2.—"Elizabeth and Victoria." By Mr. J. A. Gutch.

November 16.—"Arches and Vaulting." By Mr. A. T. Wainwright.

November 30.—"The Development of Irish Architecture from the early Celtic work to the Eighteenth Century." By Mr. J. L. Robinson, A.R.H.A.

December 15.—"Symbolism." Mr. W. Doubleday.

January 4, 1889.—"London Street Architecture, as it is and as it might be." By Mr. F. Masey.

January 18.—"Architecture of Support and Architecture of Equilibrium." By Mr. R. Radford.

February 1.—"Artificial Illumination." By Mr. J. Slater, B.A.

February 15.—"The English Classic Revival of the Seventeenth and Eighteenth Centuries." By Mr. J. M. Brydon.

March 1.—"The Life of an old Parish Church." By Mr. J. T. Micklethwaite, F.S.A.

March 15.—"Architecture in Oxfordshire." By Mr. W. A. Pite.

April 5.—"Members' Soirée."

April 19.—"Sussex and its Architecture." By Mr. Lacy W. Ridge. Nominations of officers.

May 3.—"Wrought Iron Door Furniture (Ecclesiastical)." By Mr. J. Starke Gardner.

May 17.—"The Travelling Student's Notes." By Mr. D. J. Blow. Election of officers.

#### THE LELAND CLUB.

THE fourth autumnal meeting of this Antiquarian Society commenced on Tuesday, the 2nd inst., in the City of London, when a long visit was paid to Christ's Hospital, Mr. Henry Legg, of the Architect's office, conducting the members over the establishment, explaining its history and pointing out the few remains of the famous Grey Friars Church in the cloisters of the present building, for the most part the work of Sir Christopher Wren.

Visits followed to the Cutlers' and Haberdashers' Halls, where the respective Masters, kindly exhibited the plate, and explained the history and nature of their companies.

The churchyard of St. Alphage, containing a portion of the Roman wall, and the church itself, with its grand Early English arch in the present tower, were then inspected, Mr. John Reynolds giving an account of the monastic buildings with which this part of the fabric had been connected when Sion College existed.

The next day, Wednesday, the 3rd inst., the members proceeded to Saffron Walden, and were met by the ex-Mayor, Mr. Joseph Bell, J.P., Mr. Clarke, F.S.A.; and the Vicar, the Rev. T. Stevens, M.A. At the fine Perpendicular church, Mr. Stevens gave a short but interesting account of its history, pointing out its peculiarities of architecture at the same time. The remains of the keep of the Castle, having portions of Saxon work within its walls, were next inspected and described by Mr. Clarke, F.S.A.; and then the museum, admirably arranged and containing a fine collection of Pre-historic implements, Ancient British and Roman remains, was examined under the guidance of the curator. Afterwards some of the party went to the Roman tumuli at Beaulieu, whilst the remainder visited the rare collection of pictures and other works of art and of natural history at the residence of Mr. Josiah Clarke, outside the Old Town. After examining several of the ancient houses in the town under the guidance of Mr. Joseph Bell, the members proceeded, by the permission of Lord Braybrooke, to Audley End, that famous Jacobean mansion being thrown open for their inspection. On their return to Saffron Walden, and by the invitation of Mrs. Gibson, they examined the collection of Ancient British and Saxon objects of art and implements found in the Saxon cemetery in Mrs. Gibson's beautiful grounds, upon its exploration a few years since.



on Thursday, the 4th, Cambridge was the scene of the Club's proceedings, the "Itinerary" which was drawn out by Mr. John R. Foster, arriving at Cambridge, the Archaeological Institute was examined. Mr. Foster (in the undoubted absence of the Rev. G. F. Browne, newly Professor of Archaeology) pointed out most striking objects of interest, and calling special attention to the Roman remains found in the neighbourhood, and to the enormous walls in plaster of the idols lately brought from Central America, bearing in many the sculptured faces and forms upon a striking affinity to the Assyrian and Egyptian works of art in the British Museum. 11.30 Mr. John Willis Clarke, editor of the *Architectural History* of the University of Cambridge, gave a lecture, by the permission of the college authorities, in the hall of Queen's College, which was admirably illustrated by diagrams and drawings made by the late Professor Willis, an uncle of the lecturer, the subject being "College Architecture." After a discourse, which was received with great applause, the members were conducted round the college by permission of the President and the Fellows, the College plate being also exhibited. Afterwards the Round Church and the noble old plate at Christ's College were visited and inspected; and then, arriving at 2.40 College about 2.40 p.m., the members met by Professor Middleton, Slade Professor of Fine Art, who pointed out the principal architectural features of that noble building, tracing its history whilst escorting the party and its many interesting chapels. Leaving at 3.15 the members proceeded to Corpus Christi College, where the Master, the Rev. Dr. Perowne, took them to the library and discoursed upon contents, especially pointing out its beautiful illuminated Saxon and other MSS., calling special attention to the MS. letter, in Latin, Edward VI. to his step-mother, Queen Marianne Parr. After reviewing the most ancient part of the college buildings, and the curious old plate, the Rev. Dr. Perowne took the party to the Saxon, as some prefer to denominate it, the "preman Tower" of the Church of St. Benedict, where the Vicar showed the visitors through the ancient edifice, and commented on its story and foundation. This brought the day's pleasant proceedings to a close, and the return to London was made soon afterwards by the members of the Club.

On the next day, Friday, was dedicated to a visit to Winchester, where, on arriving about 11 a.m., a party of at least thirty ladies and gentlemen proceeded under the escort of Messrs. Wright and Reynolds to the Cathedral, which, under the guidance of the Rev. Dr. Kitchin, Dean of Winchester, was thoroughly inspected. A short walk was made to the grounds of the deanery, the remains of the Pilgrims' Hall, now used as a barn or general store-house, examined. After luncheon at the Royal Hotel, the party, led by the Dean, proceeded to the College School, where the head-master, the Rev. Dr. Fearon, received and conducted the members through the principal portions of the famous building, explaining and pointing out the oldest features of the plan of Wykeham's work; afterwards, led by the bursar, Mr. T. F. Kirby, the audit-room, library, and chapel were visited, the latter a pleasant room when conducting the party by the edge Meads to Saint Cross, where several monks of the ancient order of bread and beer are leaving that venerable and once important monastic establishment.

At the railway station, on the departure of the members of the Leland Club for London elsewhere, Mr. Williams, of Clifton, presented a vote of thanks to Messrs. Wright and Reynolds for their services to the members through the week's proceedings, and which was responded to, heartily though briefly, by the gentlemen, the fourth annual London country meeting of the Leland Club came to an end.

#### EXTENSION OF WATERWORKS, ABERDEEN.

Attention of the Town Council of Aberdeen having been directed by their engineer, Boulton, to the scarcity of water, principally in the high-lying districts of the town, in a remit was obtained to call in Mr. James M. Gale, the engineer for the Glasgow Corporation Commissioners, to advise generally as to best means of improving the supply. In report, among other things, Mr. Gale advised the erection of a new pumping-engine station,

two new service reservoirs, with the necessary connecting and distributing mains, and the extension of the intake. These works are now almost completed.

The original reservoir for the low service, at Mannofield, intended to hold about six million gallons, has now been supplemented by the construction of an additional reservoir, closely adjoining to the west. The new reservoir is now finished. It is circular in shape, 370 ft. in diameter, and holds 18 ft. of water, which means a capacity of twelve million gallons, and is equivalent to about two days' supply for the whole city. The average level will be about 160 ft. above high-water mark.

The walls of the new reservoir are formed of granite ashlar masonry, built one header to every two stretchers, the headers being 30 in. long and 18 in. in breadth of bed, and the stretchers 3 ft. long and 12 in. in the breadth of bed, backed with heavy rubble masonry, all built in cement mortar in the proportion of 2 parts of sand to 1 of cement. The walls are surrounded by a lining of clay puddle 12 in. thick.

The bottom of the reservoir is of concrete, 13 in. thick, and has been put down in three layers. The bottom layer is 6 to 1 and the middle layer 5 to 1, both these layers being 6 in. thick. They are finished on the top with a layer of cement plaster 1 in. thick, in the proportion of 1 to 1. These layers are arranged in panels about 36 ft. square, this being an ordinary day's work for the squad of men employed. A squad of men is kept working on all three layers, so that three panels a day are being put in. The panels are so designed that the joints in each layer are in the middle of the panel, above or below. The walls are designed in such a way that the reservoir may be covered over at any future time if considered desirable.

In connexion with the reservoir there is a straining-chamber, 20 ft. square and 20 ft. deep, and a gauging-weir 10 ft. wide. The connecting pipes between the new and the old reservoirs and the outlet-pipe to serve the city are so arranged as to supply the town in three different ways—either from each reservoir separately, from both in conjunction, or by direct supply from the aqueduct. A further arrangement has also been made, whereby when the River Dee (whence the town's supply is derived) is in flood and the water discoloured, the new reservoir can be used as a settling pond for the old one. The total expense of this new reservoir, exclusive of the cost of site, will be about 15,000*l*.

The Slopefield Reservoir for the mid-level service has been planned on similar lines. It measures 270 ft. in diameter, with 18 ft. depth of water. It will be finished by the end of September and will contain six million gallons of water. The level of this reservoir is 300 ft. above high-water mark at Aberdeen. The water will be used to supply the whole of the high-lying district within the Municipal boundary. The water for this reservoir will be pumped from the aqueduct at Culter, near which a steam pumping-station has recently been erected at a cost of 7,000*l*., including both engines. The first engine is capable of raising half a million gallons in twelve hours. It is a horizontal compound surface-condensing engine on the tandem principle. The new engine, on the other hand, will have cylinders placed parallel, and will be worked by gearing. It is said to be capable of raising one million gallons in twelve hours to a height of 140 ft.,—being the difference of levels. The pumping main is about one mile in length and 20 in. in diameter, spigot and flange, part with turned and bored joints, and part with lead joints. There is a special electrical indicator fitted up between the reservoir and the pumping-station to show the rise and fall of the water in the reservoir. In connexion with the new reservoir, new mains, about ten miles in length, and costing about 12,000*l*., have been laid in the city. The cost of the Slopefield Reservoir, exclusive of site, will be about 9,000*l*.

The previous intake at Cairnron has been shifted 400 yards up the River Dee, with the object of ensuring a steady supply in times alike of frost and of drought. The Town Council have obtained power from Parliament to increase the supply from six million to eight million gallons a day, and the new intake will afford opportunities for taking in an ample supply irrespective of the weather.

It may be mentioned that the High Service Reservoir at Hillhead of Pittodols (which is 400 ft. above sea-level and contains about half a million gallons) will be retained and fed by

the old hydraulic pumping-machines at Morrison's Suspension Bridge, Culter. The whole of the new works have been designed by Mr. William Boulton, M.Inst.C.E., the Borough Surveyor of Aberdeen, and have been carried out under the personal supervision of his chief assistant, Mr. A. Dyack, A-M.Inst.C.E.

#### THE "NATIONAL STANDARD" THEATRE IN THE AUCTION MART.

THE putting-up for sale of the National Standard Theatre, in Shoreditch, on Wednesday, under the will of the late Mr. John Douglas, brought together one of the largest audiences which have been seen at the Auction Mart for many years past. The sale was held in one of the large rooms at the Mart, and some time before the hour announced for its commencement every seat was occupied, and there was not even standing-room for the large numbers who were anxious to obtain admission. Amongst those present, the theatrical profession was largely represented. Sir J. W. Ellis, M.P., conducted the sale, and in an address of considerable length, described the property as one of the most valuable freeholds in the East-end of the Metropolis, observing that the theatre, which was one of the largest in London, was entirely rebuilt in the most substantial manner in the year 1867, and, as indicating its large dimensions, he stated that the auditorium afforded accommodation for 4,200 persons, realising, at popular prices, about 200*l*. The stage arrangements were also referred to, the auctioneer observing that the stage was of exceptionally large dimensions, measuring upwards of 60 ft. square, and very lofty. Three houses and shops in Holywell-lane were included in the sale, these being used as dressing-rooms and store-rooms in connexion with the theatre; also two houses in George-street, forming an emergency exit from the pit. He announced that the Bishopsgate Hall was likewise included in the sale. It was stated to be approached from High-street, extending over the grand staircase to the theatre, and measuring about 73 ft. by 34 ft. It is capable of seating about 800 persons, has a stage and gallery, and suitable for use as a minor theatre or lecture room. The entire property forms a compact freehold block, and covers the extensive area of 17,100 ft. The auctioneer, in estimating the value of the property, reminded the company that they had to deal not only with the buildings themselves, but also with the freehold land upon which they stood, and he was enabled to say from a long experience, that freehold land in this part of Shoreditch was worth 3*l*. a foot, which would give 50,000*l*. as the value of the land alone. The biddings commenced by an offer of 20,000*l*., and by successive advances 31,000*l*. was reached without any further offer, on which the auctioneer observed that it was not even the value of the land. The property was ultimately withdrawn, it being stated in the sale-room that the reserve price of the property was 63,000*l*.

#### LIGHT RAILWAYS.

At a meeting of the Society of Engineers, held at Westminster Town Hall, last week, Mr. A. T. Walmisley, President, in the chair, a paper was read on "Light Railways," by Mr. William Lawford, M.Inst.C.E.

The paper first drew attention to the fact that the subject was not a new one, having been brought before other scientific bodies about twenty years ago, and also that since that period not much appeared to have been done with light railways, in this country at least, and that amongst those that had been constructed, few, if any, had proved commercially successful. The author endeavoured to show the reasons for this, and contended that up to the present time they had scarcely had fair play shown them, and that greater facilities for construction should be granted by Act of Parliament. He then showed that, comparatively speaking, the so-called Railways Construction Facilities Act was not made much use of; of the ordinary Act of Parliament, notwithstanding its additional cost, being evidently preferred.

The development of steam tramways and road railways was then brought forward, and the term "light railways" properly defined, and the latter was exemplified by a description of the Wotton Tramway constructed for the Duke of Buckingham and opened for traffic in 1871: the



traffic results on this line for the year 1887 were then given.

The author next introduced the subject of break of gauge, as many light railways have been made on less than the normal gauge of this country, which necessarily involved a break of gauge; this was exemplified in the case of the Festiniog Railway, which has a two-foot gauge; and the opinions of some engineers of eminence were given on the gauge question. Mention was also made of the actual difference in the cost of construction of a double line of mixed gauge (a line combining the 7 ft. 0 in. and the 4 ft. 8½ in. gauges) as against a double line of the 4 ft. 8½ in. gauge only, on a well-known suburban railway; and some interesting particulars upon the alteration of a gauge of eighty miles of open railway were alluded to, showing how this was accomplished without interfering with the traffic.

The suggestions of the Report of the Commission on the Depression of Trade was shown to have some bearing on this question, from the fact that light railways or steam tramways would be the means of greatly assisting the transport of agricultural produce generally, so as to bring it rapidly and cheaply to market, the assumption being that such districts as those alluded to might bear the expense of making and working a light railway, whilst the population was too sparse and too widely scattered to support a railway of heavy or ordinary construction. An American engineer's idea on this subject was then quoted to show how the traffic in this country was carried on, and how it ought to be carried on, and that we should not have such a large proportion of non-paying loads as we are in the habit of doing.

The introduction of the bogie wagons would, no doubt, help largely to reduce working expenses on ordinary railways, and especially so on light railways. Moreover, such bogie wagons could run round very sharp curves without injury to the road-bed on which they ran. The Wolverton and Stony Stratford Steam Tramway was described, on which there are double bogie passenger cars running, carrying 134 passengers, the length of these cars being 48 ft. This is a narrow-gauge line, the rails being only 3 ft. 6 in. apart. After passing through Stony Stratford the line is extended to the village of Deanshanger as a road railway, the rails being laid on the waste space at the side of the road. Other light railways and steam tramways, either at work in this country or in course of construction, were then mentioned.

Certain light railways in Russia, known as the "Maltzev" railways, were alluded to, but all that is known of them is that their cost is barely one-fifth per mile of the ordinary heavy lines in that country, and that they pay an annual surplus profit of 34 per cent. on the cost of construction.

The average cost of railways in the United States is said to be 6,000l. per mile; in England it is about 40,000l.; while a road or light railway can be constructed and equipped for from 4,000l. to 5,000l. per mile. Light, or secondary railways, as they are called in France, are constructed on the normal or 4 ft. 8½ in. gauge, at a cost of 4,800l. per mile, including equipment and all expenses. In Prussia, a light or road railway was constructed in 1864, gauge 4 ft. 8½ in., length twenty miles, cost 3,231l. per mile, including equipment. In Hungary, all railways are on the 4 ft. 8½ in. gauge. There are two classes of railways, the first class for main or important lines, the second class for poorer districts, which can be turned into first-class lines if the exigencies of traffic require it. These second-class lines have cost 6,450l. per mile, but as they were made when iron, materials, and labour were very expensive, they would now probably be made for about 5,000l. per mile. There were about 300 miles of second-class lines in Hungary some twelve years back, and fifty-eight miles of additional lines have also been made, at an average cost of 4,184l. per mile.

The conclusions arrived at were, that if light railways can be made to pay their promoters in other countries, why should they not do so in this? And the author gave it as his decided opinion they had not yet had fair play accorded to them.

**Appointment.**—At a meeting of the Newmarket Rural Sanitary Authority, on the 25th ult., the resignation of their Surveyor, Mr. William Fraser, was accepted with regret, on this being appointed Surveyor to the Cardiff Rural Sanitary Authority.

#### OBITUARY.

**Mr. James Sellars, Architect.**—The profession and general public will learn with great regret of the death of Mr. James Sellars, the well-known Glasgow architect, and the designer of the Glasgow Exhibition, which took place on the morning of Tuesday last. Mr. Sellars was essentially a Glasgow man, having been born in the city, and remained all his life professionally and residentially associated with it. He has been in failing health since before the completion of the Exhibition; and, although the news has come upon the public as entirely a surprise, the consummation had for some time been too surely foreseen by his own circle of friends. Born in 1843, Mr. Sellars, when no more than a lad, entered the office of Mr. Hugh Barclay, architect, some years thereafter gravitating to that of Mr. Campbell Douglas, with whom, after a time, he entered into a partnership which has lasted to the close, and all along enjoyed a large measure of professional success. Besides the Exhibition, the name of the deceased architect is associated with the St. Andrew's Hall, the New Club, West George-street; the Glasgow Herald Buildings, Buchanan-street; the warehouse (in terra-cotta) of Messrs. Wylie & Lochhead, also in Buchanan-street; and with numerous other public and private buildings of merit in and around Glasgow. He was President of the Institute of Architects, Glasgow; and for some years a member of the Council controlling the Institute of the Fine Arts. On the occasion of the recent Royal Visit, he had the honour of being presented to her Majesty. Mr. Sellars, who was held in high esteem alike in public and private life, leaves a widow and family.

**Mr. Daniel Miller, C.E.**—The death is announced of Mr. Daniel Miller, C.E., of Glasgow, formerly of the firm of Bell & Miller, St. Vincent-street. The son of a Glasgow brass and iron founder and copper-smith, who long carried on the Saracen Foundry (subsequently owned by the late Mr. Walter Macfarlane), the deceased was (according to the *Glasgow Herald*) born in January, 1826, so that at his death he was well advanced in his sixty-third year. He served a regular pupillage in civil engineering in the offices of Mr. Lewis D. B. Gordon and Mr. Laurence Hill, the former of whom was Rankine's predecessor in the Chair of Civil Engineering and Mechanics in the University of Glasgow, and was, indeed, the first holder of that appointment. It was while in this office that young Miller first made the acquaintance of the late Mr. R. Bruce Bell, with whom he afterwards, in 1850, entered into the partnership which was so closely identified with the profession of civil engineering.

#### THE AUCTIONEERS' BENEVOLENT FUND.

THE annual meeting of the donors and subscribers to this fund was held on Wednesday last at the Estate Exchange, Auction Mart, Mr. Daniel Watney, Treasurer, in the chair. There was a good attendance.

The report of the committee contained the following passages:—"Your committee have again the pleasure to report an increase in the subscriptions for the past year, although the donations are less. They are as follows:—Subscriptions, 248l. 17s.; donations, 42l.; against 222l. 12s. and 93l. 9s. respectively received in 1887. During the past year there have been eleven new subscribers, while the society has lost by death and otherwise four old subscribers. The former includes the Auction Mart Company, who have generously given their first annual subscription of 10l. 10s., while the donations include the sum of 31l. 10s. kindly presented to the society by the executors of the late H. E. Murrell, Esq., out of a sum of money left for charitable purposes by the deceased. Much can be done by individual effort, and in order to make the society more worthy the profession, your committee hope that subscribers will never lose an opportunity of pressing the claims of the fund upon any non-subscribers with whom they have any influence. The applications for relief are on the inevitable increase, and there are several candidates for annuities." The report went on to enumerate the various cases relieved during the year, and gave particulars of seven annuities paid from the fund, amounting in the aggregate to 134l. per annum. The report then continued as follows:—"In addition to the above, your committee announce with very great pleasure that the sum of 35l. was at the close of last year handed to the Treasurer by a gentleman (who does not wish his name to be known), with a request that 5l. should be presented to each of the seven annuitants as a special gift in commemoration of the Jubilee of her Majesty's reign. The money was accord-

ingly distributed at Christmas last, and it is hardly necessary to add that the recipients were most grateful to their unknown benefactor. During the year the sum of 235l. has been added to the investments, and in order to increase the income available for annuities the amount recently in Consols has been re-invested in India Three-and-a-Half per Cent. Stock, the investments now being—Queensland Four per Cent. Inscribed, 2,978l. 8s. 6d. Stock; India Three-and-a-Half per Cent., 1,034l. 17s. 6d. Stock. The members of the committee retiring rotations are:—Messrs. Driver, Green, Hain, Harris, Tewson, Wilkinson, Woods, and the Chairman of the Exeter and Devon Auctioneers' Association, all of whom are eligible for re-election."

The report was adopted, and Mr. C. R. Foster, Pall Mall, was added to the Committee. Several new subscribers (through the instrumentality of Mr. H. J. Thurgood) were announced. Some other business was transacted, and the proceedings terminated.

#### A NOVEL LIGHT AND AIR CASE.

AN application for an injunction to restrain a defendant from erecting a building was made last week by Messrs. Nott, Watson, & Co. against Mr. Harrod. The structure for which the rights were claimed was a large timber-store formed with timber framing, carrying a pantile roof. The building is of large dimensions, the side next to the defendant's new building having a brick wall about 8 ft. high, and the remainder of wood, the boards 8 in. in width, with three inch-spaces, a light in the building being bright and decidedly admirably suited to the purpose of sorting and arranging boards of various kinds.

After the first hearing before the Vacation Judge (Sir James Hannen), the parties met and agreed terms, so that the building will proceed.

Mr. H. Longrove was surveyor for the plaintiff, and Mr. W. Stephens and Mr. A. Williams for the defendant.

Owing to this arrangement to compensate for damage, a decision in a novel case, which could not but have been of much interest, was not obtained.

#### ACTION FOR PROFESSIONAL FEES.

LEGO V. MASON.

ON Wednesday, in the Westminster County Court, this case was tried by his Honour Judge Bayley and a jury. The plaintiff is an architect, and holds the post of Architect to Christ's Hospital, and he sought to recover from the defendant, a gentleman living at 8 St. James's-place, W., the sum of 39l. odd for professional fees.

The plaintiff's case was that early in 1885 he was called upon by the defendant's then solicitor, asked to examine a house opposite to him, and give his opinion as to whether it shut out the (Mason's) light and air. He did so, and an action was brought by the defendant against the owner of the house, a gentleman named Moore. The plaintiff attended five days at the High Court, but was not examined till the fifth day. It was necessary for him to make plans and do other work, for which he had charged 18l. odd, and he had only charged five guineas a day for attendance, although he usually got ten guineas. He had not been paid anything for his services. Mr. Mason lost the action, and he had heard that he had paid 1,700l. in costs.

For the defendant it was contended that a charge paid his solicitor in reference to costs was an answer to the claim, and that it was the duty of his solicitor to have paid the plaintiff his charges. This charge was put in, and showed that professional charges were left out of it.

His Honour said there was no defence whatever to the action, and the jury at once returned a verdict for the plaintiff for the amount claimed.

#### Cheadle and Gatley Main Drainage.

The scheme of Mr. J. B. Everard, M. Inst. C.E. of Leicester, has been placed first in the competition for the main drainage of Cheadle and Gatley, near Manchester; that of Messrs. Brierly & Holt, of Manchester and Blackburn second; and that of Messrs. Landsborough & Preston, of Bradford, third. We understand that Mr. James Mansergh, M. Inst. C.E., London, was called in by the Local Board to advise them in making the award. The amount of the estimate for the successful scheme was 23,300l.

#### New Police Buildings at Finchley.

A new police-station is at present in course of erection in Ballard's-lane, Finchley, and is fast approaching completion. The front elevation is in Mansfield stone and red moulded brickwork. The building contains three floors, one floor providing residences for the inspector and accommodation for the officers of the force. The ground floor contains the inspector's and other offices and waiting-rooms, and at the rear a cells, ambulances, sheds, and stables. Messrs. Kirk & Randall are the contractors.



## COMPETITIONS COMMITTEE, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

MR.—Will you allow us to state, through your journal, that we are now preparing a list of those architects who have signed agreement not to take part in any public architectural competition unless one or more professional assessors are appointed to advise, promoters, and that we shall be glad to give the signatures of those architects who have recently started in practice, or have not signed the undertaking, and shall be pleased, application, to send them the usual printed list.

The revised list will show a very considerable increase in the adherents, in spite of the inevitable loss by death or resignation, and there can be no doubt that a large measure of reform has already been the result of the efforts made to that end, wherever possible, the appointment of a professional referee.—We are, your obedient servants,  
COLE A. ADAMS,  
ASTON WEBB,  
Hon. Secs. of the Committee.

Conduit-street, Hanover-square,  
London, W., October 10, 1888.

## THE MILDMAY TOMB IN ST. MARY'S CHURCH, CHELMSFORD.

MR.—No doubt your illustration of this monument is a correct reproduction of Mr. E. A. Barr's drawing.\* I therefore think it only right to set out that it is far from accurate. I had a scale been given, or a few dimensions, the use of the drawing would have been enhanced. I give a few figures, by means of which those interested may find the correct proportions of the monument.

The length of the plinth is 8 ft. 2 in.; height from base to top of cornice is 4 ft. 6 in., but in illustration, 5 ft. 1 in., making a difference in height of 9 in., and altering the proportion of the lower to considerably. The centre panel, with achievement, is much nearer square than shown, being 16½ in. high by 16½ in. wide; and there is no such line that shown across the lower part of the panel; the base of the shield touches the bottom of the panel in the original.

The semicircular pediments are drawn much too low, and should be struck from a point 1½ in. above cornice.

The radius of the curves to the sides of the ogival element should be about 6 in. less than shown. The strap-work has several parts omitted, including the large scrolls beneath the inscription-panel, and the tablet with the date is about half its correct height.

There are minor points, such as the shape of the pediments on the cornice (which in the original vary from the illustration) and incorrect jointing; I think I have shown that the drawing is far from being a correct delineation of the monument. I presume it will be generally admitted that, if illustrations of old work are to be of use, they must be accurate, and I therefore trust you will see my reason for bringing the above before your notice.

FRANCIS E. L. HARRIS.  
Chelmsford, Oct. 9, 1888.

## SUGAR IN MORTAR.

MR.—In some buildings to be erected this autumn I am anxious to protect brickwork from damage by frost. I should feel greatly obliged if you or some of your numerous readers would kindly give their experiences of mixing sugar with mortar, at the same time give quantity required to a load of cement, and also name the quality found suitable. I led to suppose with this addition to ordinary mortar that a struck joint would remain uninjured.  
READER.

**The School of Art Wood-Carving.**—The School of Art Wood-Carving, held at the City & Guilds' Institute, Exhibition-road, South Kensington, has been re-opened after the usual summer vacation, and we are requested to state that one or two of the free studentships in the evening classes maintained by means of funds granted to the School by the Institute are vacant. To bring the benefits of the School within the reach of artisans a remission of half the fee for the evening class is made to artisan students connected with the wood-carving trade. Forms of application for the free studentships, and any further particulars relating to the School, may be obtained from the manager.

**Lyric Theatre.**—We understand that the reformation of this theatre is to be entirely carried out by Messrs. Campbell, Smith, & Co.

## The Student's Column.

## ARTIFICIAL STONE.—XV.

Stones formed from Residuals, By-products, &c.

THE sixth division of our subject includes those artificial stones mainly formed from ingredients which are by-products or residuals in manufacturing, mining, or quarrying operations, and comprises a few patents of considerable interest, some of which have been referred to in preceding sections. One of the earliest patents that can be grouped in this class was Swindell's, who, in 1841, proposed to utilise a residuum consisting of oxide of iron, silica, alumina, lime, sulphate of lime, and chromate of iron, produced in the manufacture of chromium compounds. The same patentee also suggested plans for preparing cements and artificial stones from waste of alkali makers and the residual oxide of iron obtained by burning iron pyrites in sulphuric acid manufacture.

A large number of patentees have attempted, with more or less success, to utilise the inexhaustible and ever-increasing accumulation of slag from iron and other smelting works. Some rather serious difficulties have to be overcome before a really workable and economical stone can be obtained from this substance; thus, if it be obtained (as already described) by casting the fused slag in moulds, it will be flinty, brittle, and difficult to work, and also vary considerably in homogeneity; on the other hand, if the slag be used in the form of sand or cement, to be added to other cements, the wear and tear of the grinding machinery and the weight of the stone produced will, as a rule, prevent its economical employment at any distance from the place of manufacture.

Blanchard's patent process for dealing with slag involves the mixing of ground slag with refuse from granite and slate quarries, clay, lime, chalk, silica, alkalies, or similar materials; the mass being moulded with water is fired in a kiln, and the resulting semi-vitrified stone is of the nature of terra cotta.

Bodmer employed a mixture of slag, cinders, scoriae, &c., ground up with slaked lime. As regards the best form for admixture with lime, Tetmaier has quite recently shown that to increase the cohesive power of a cement or artificial stone composition containing slag, it is very important to granulate the slag before mixing it with the lime, &c. The explanation of this necessity is to be found in the theory that, in the process of granulation by sudden cooling of the melted slag with water, a molecular condition is produced favourable to a certain degree of combination between the slag particles and the lime; a little of the silica is also rendered soluble, and some sulphur got rid of, and this latter seems to be an advantage. The nature of the prejudicial influence exerted by sulphur, if present in any quantity, seems to be somewhat obscure, though it possibly may be due in some measure to the formation of soluble and easily decomposable alkaline or alkaline earthy sulphides. Tetmaier also asserts that cold destroys the cohesiveness of a slag mortar or stone mixture, where therefore should not be used or exposed when freshly made to a temperature below the freezing point. The proportion of lime to slag-sand, according to the same authority, should never exceed 48 per cent., and the best results are, as a rule, obtained with a proportion of from 30 to 40 per cent. In Pozzi's patent process "granitic" sand, obtained by disintegrating refuse granite by heat, is combined with slag, glass, and a large proportion of ordinary and refractory clay, mixed with water to a pasty consistency, moulded to the required form and allowed to harden.

M. Laurette prepared a stone which might be "cut, sawn, turned, or carved," by mixing powdered blast-furnace slag with hydraulic or other cement, pressing strongly in moulds while yet moist, and allowing to harden at the ordinary temperature. Mr. C. Woods, who at the Cleveland Slag Works laboured indefatigably to turn to profitable account the mountains of slag which in the Cleveland district are ever growing, and which threaten to attain ultimately Alpine proportions, combined slag sand with iron ore or refuse pyrites and quick-lime, hydraulic or other cement. The slag is run from the furnaces in a melted state on to revolving iron tables, cooled rapidly with water,

and broken up to varying degrees of fineness. This slag sand may be made into bricks with Scott's selenitic lime (already described); in the proportion of 10 parts of the sand to 1 of selenitic lime. The bricks, after pressing and moulding, are dried in air. For building stone Mr. Woods prepared a composition containing 2½ parts finely-pulverised slag, 2½ parts of ground firebrick, 1 part of Portland cement, and sufficient water; this mixture placed in moulds sets quickly, and it is ready for use in two or three days. It may be of interest to our readers, as showing the cost of bricks made from this waste product in a large centre of production, to point out that at Middlesbrough the price quoted was, about a year ago, 13s. 6d. per 1,000.

Mr. Ransome suggested the use of a cement for stone-making which he alleged was at least thirty per cent. stronger than the best Portland cement, and which was prepared by mixing slag sand in a wet state with chalk and then burning to clinker in a cement-kiln and grinding, as for Portland cement.

Another mixture said to be useful is formed of 2 parts of blast-furnace slag, 5 parts of lime, and 2 parts of clay; these ingredients are well mixed, calcined, and ground.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

14,851, Stone-dressing Machinery. J. Coulter.

In machines of a class where the stone is placed upon a table traversing backward and forward underneath cutting-tools, after the manner of an iron planing-machine, it is claimed that improvements are made by this invention. They consist (1) in the employment of cutting-tools placed horizontally, and in cutting-tools placed vertically, for the purpose of dressing or cutting the upper surface and also one edge of the stone, and (2) an apparatus for reversing such tools. Tool-holders of special form are used, and a simultaneous movement is imparted to them by gearing adapted for the purpose. A rocking bar and lever is also constructed and adapted particularly for rocking the cross-head when reversing the position of the tools.

14,955, Syphon-flushing Cisterns. D. T. and W. Bostel.

The design of this invention is to obviate the noise in discharging the cistern. An extra bend is placed on the syphon-leg, and over its orifice is fitted a perforated pipe, or a cage, or wire-guard, in which is contained a ball of light substance; this dropping on the open end of syphon, prevents the noise.

15,071, Chimney-top and Ventilator. J. Wright.

This invention relates principally to the construction of an improved chimney-top designed to prevent down-draught in the flue or chimney. The same construction is also applicable to ventilators to extract the foul air or vapours from apartments. Coned deflectors are used, and sometimes spiral tubes, to increase the draught.

15,203, Waste-flushing Cisterns. J. West.

By this invention a small cistern is suspended so that it oscillates in a larger one. When charged with water it is released by pulling back a catch, and flushes the pipes, &c.

16,459, Sash-fasteners. D. Knowles

This invention aims at the production of a springless, simple, durable, and cheap sash-fastener, and one which cannot be opened from the outside without breaking a pane of glass, though easy to release from the inside. To the top rail of the bottom sash is fixed a metal bush having a pivot on which rotates an arm or lever, one end of this lever passing under an ordinary rack attached to the bottom rail of the top sash, thus securing both sashes from vertical movement. Further modifications are also made for greater security.

11,148, Checking or Subduing Fire. T. R. Douce.

This patent relates to a further detail of improvement in previous devices for subduing fire in the holds of ships or in buildings by the generation of gases. In this, a small, fragile receptacle, containing an acid, is broken by any suitable means, and the contents, mingling with another compound, the gas is set free. The breakage is effected either by wires, cranks, levers, &c., actuated by hand, or automatically acted upon by heat.

## NEW APPLICATIONS FOR PATENTS.

Sept. 28.—13,952, H. Steven, Fittings for Baths, Lavatories, &c.—13,955, J. Rushton and T. Atkinson, Fastenings, &c., for Window-sashes.—13,977, A. Del Guerra, Opening and Closing Window-sashes.

Sept. 29.—14,011, J. Jones, Attaching Cords to Sash Windows.—14,014, W. Perry, Window-fastening.—14,029, H. Berry, Dry-earth and other Closets.

\* Of course, it is a photograph.—Ed.



Oct. 1.—14,073, R. Hyde, Raising and Lowering Sliding Windows, &c.—14,104, E. Dickinson and F. Kindermann, Ventilating Appliance.

Oct. 2.—14,127, H. Lake, Pipe-books.—14,153, D. Clohesy, Under-cutting or Dovetailing Wood, Stone, &c.—14,159, N. Hopworth, Shop-fronts.—14,168, L. Boutin, Chimneys and Ventilators.—14,167, A. Thomson, Paint or Enamel.—14,173, W. Dawson, Window-sashes.—14,175, L. Pichey, Tools for Working Stone, Slate, Marble, &c.

Oct. 3.—14,198, S. Smith, Combined Ventilator and Gas Bracket for Walls.—14,202, E. Mann, Opening and Shutting Windows or Shutters.

Oct. 4.—14,199, J. Wilson, Walls, Buildings, &c.—14,286, J. Ransome, Artificial Stone and Concrete Blocks.—14,288, M. Moser, Burglar Alarm.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

11,250, T. Dodd, Casement Fasteners and Lift-latches.—11,466, C. Southon, Chimney-cowl.—12,068, F. Harvey, Immediately Stopping Bursts or Leaks in Water or Gas Pipes.—12,173, C. Young, Automatic Bolt for Double Doors.—12,192, T. Hargreaves, Safety Window-fastening.—12,225, K. Bernhard, Safety Contrivance for Windows.—12,258, T. Whitaker, Hinges for Folding-doors, &c.—12,330, W. De Morgan, Walls and other Brick Structures.—12,499, R. Mason, Windows and Operating same.—12,569, T. Harris, Stoves or Fire-places.—12,570, T. Harris, Fire-bars or Grates.—12,571, T. Harris, Stoves.—12,582, C. Hamilton, Attaching Incandescent Electric-lights to Gas-brackets, &c.—12,675, F. Butler, Builders' or Decorators' Scaffolding, &c.—12,676, De Pennefather, Ventilating Buildings, &c.—12,701, O. Imray, Preventing Window-sashes Shaking.—12,708, E. Nunan, Metal-laths for Building.—12,729, G. Böken, Metallic Roofing.—12,739, J. Hancock, Creating Updraughts in Chimneys and Ventilating.—12,696, J. Rogers, Flushing Cisterns or Water-waste Preventers.—13,177, R. Thomson, Combined Lavatory and Water-closet Basins.—13,536, W. Howcroft, Paint Brushes.

#### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

15,520, W. Stanford, Joining Stoneware and Other Pipes.—15,996, W. Lake, Preventing the Slamming of Doors.—16,069, E. Grube, Ventilating Fans.—16,262, F. Seyde, Metallic Lathing or Backing for Plaster or Cement Partitions and Ceilings.—16,597, F. Collins, Indicator for Door-fastenings.—3,197, W. Morion, Whitewash and Distemper Brushes.—10,706, G. Evans, Window-frames and Hanging the Sashes.—11,202, C. Schubert, Band-saw Machinery.—12,329, A. Boul, Door-knob Attachments.—12,397, W. Thompson, Sewer-gas Excluders.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

###### Oct. 2.

By S. WALKER & RUNTE.  
Kensington—23, Addison-gardens South, 70 years, ground-rent £113 .....

£800

###### Oct. 3.

By FULLER, HOBBS, SON, & CASSELL.  
Enfield Highway—A freehold fruit farm, 19a, 1r, 30p .....

3,000

###### By T. TURNER.

Hyde Park—91, Edgware-road, 28 years, ground-rent £18, 8s .....

1,000

Paddington—28 & 29, Westbourne-park-villas, 155 years, ground-rent £15, 6s .....

1,805

###### By F. HARRIS.

Greenwich—7, Tylo-street North, freehold .....

210

The beneficial interest in 13-14th parts of the "Crown and Sceptre" Hotel; a plot of land; and No. 10, Queens-street, freehold .....

170

###### Oct. 4.

By FERNER, PRICE, & FERNER.  
Islington—81, 83, & 85, Essex-road, and a plot of land, freehold; also 79, Essex-road, 94 years, ground-rent £188 .....

3,750

###### By NEWSON & HARDING.

Mighbury—41, Kelvin-road, 71 years, ground-rent 28 Barnsbury—7, John-street, 21 years, ground-rent £3, 3s .....

300

Islington—49, Queensbury-street, 22 years, ground-rent £1 10s .....

139

Holloway—26, Tabby-road, 78 years, ground-rent 47 .....

140

23 and 25, Hanley-road, freehold .....

345

27, Hanley-road, 18 years, ground-rent 25 .....

150

A plot of freehold land in rear .....

500

Ground-rents of £13, reversion in 99 years .....

290

West Green-road—A plot of freehold land .....

40

Derby-road—Two plots of freehold land .....

125

Southgate, Chase Side—Two plots of freehold land .....

170

Worthing—5, 6, 10, 11, and 12, Palmerston-terrace, freehold .....

1,110

###### Oct. 5.

By TOLLE & HARDING.  
South Kensington—7, Summer-place, 40 years, ground-rent £15 .....

2,000

#### MEETINGS.

##### TUESDAY, OCTOBER 16.

Glasgow Architectural Association.—Professor G. Baldwin Brown on "The Art of Decoration."

##### WEDNESDAY, OCTOBER 17.

Builders' Foremen and Clerks of Works' Institution.—Quarterly Meeting, 8.30 p.m.

##### FRIDAY, OCTOBER 19.

Architectural Association.—Address by the President, Mr. H. D. Appleton, 7.30 p.m.

#### Miscellaneous.

##### Sale of Building Sites and Ground Rents at Brentwood.

Last week Messrs. Baker & Sons offered for sale a large number of building sites on the Ongar-road Estate at Brentwood, Essex. The sale also included several dwelling-houses on the estate, and a number of freehold ground rents. The sale took place at the White Hart Hotel, when there was a numerous attendance of buyers. The building sites submitted were eighty-nine in number, nearly the whole of which have frontages of 20 ft. each, and depths of from 150 ft. to 200 ft., some larger plots having frontages of 24 ft. and 30 ft. each. A large hotel plot, having a frontage of 50 ft. and a depth of 195 ft., was likewise included in the sale. Out of the entire number of sites offered, ten were shop plots, having their frontages to the main Ongar-road, and for these there was a close and spirited competition, all of them finding purchasers at prices ranging from 300 to 350 each. For the remaining plots, having their frontages to a newly-formed road, named Retailack-avenue, the prices obtained varied from 120 to 200 each, the whole of them being sold. The hotel plot realised 600, the total sum received for the several sites being about 1,200. The auctioneer next submitted for sale thirteen dwelling-houses which have recently been erected on the estate. They are all uniform in size, and were described as well and substantially built, containing seven rooms each, and approached by a 22 ft. tiled fore-court, fitted with cathedral glass, tiled stoves, Sicilian marble mantels, and large kitchen-ranges. They are held for an unexpired term of ninety-six years, at a ground-rent of 50 per annum, and let at rentals of 180 a year each. They were offered in separate lots, the auctioneer stating that they were offered absolutely without reserve, by order of the mortgagee, and would all be sold whatever they might fetch. The highest sum offered for any of the dwellings was 500, the majority of them being sold at the unusually low price of 470 each (the tenants being understood to be the purchasers). The ground-rents on the above thirteen houses, amounting to 650 a year, were next submitted, and for these there were several competitors, the sum realised being 1,600, representing about four per cent. on the purchase, the total aggregate proceeds of the day's sale being about 3,400.

**A New Music-hall at Brighton.**—The new music-hall known as the "Brighton Alhambra" has been completed. We are informed that it has received special attention on the part of Mr. Frank Matcham, the architect, who has provided a system of appliances for the prompt extinction of a chance outbreak of fire. By arrangement with the Brighton Waterworks, a special large main has been laid off the extra high-pressure water-main which supplies the Grand Hotel, 100 yards from the Alhambra entrance, and this main shows a constant pressure of nearly 250 ft. head. Thence a 4-in. fire-main has been fixed by Messrs. Heathman & Co., of Endell-street, into the promenade, rising to the gallery, with Heathman's improved hydrants mounted upon the pit, dress-circle, and gallery levels. Another main is fixed under the auditorium to the cellar, with similar hydrants upon the stage, fly, and dressing-room levels behind the scenes, and each is supplied with a set of hose, nozzle, and interchangeable couplings. To provide against a chance failure of the Water Company's supply, a capacious storage tank, 11 ft. 6 in. by 6 ft. by 5 ft. 6 in., has been fixed over the gallery, and the fire-main connected thereto with Heathman's "automatic reflux valves," enabling the water to flow to the hydrants from either the waterworks main or the tank, according to which yields the highest pressure when a fire happens. A pressure tell-tale is fixed to indicate the variations in the water pressure.

**Sam Deards & Company (Limited).**—We have received the prospectus of this new company, which has a share capital of 25,000. The company has been formed for the purpose of purchasing, continuing, and developing the old-established business of horticultural and hot water engineer, carried on by Mr. Samuel Deards, and of the patents of "Victoria Dry Glazing" (No. 2,805), "Champion Coil Boiler" (No. 761), and "Princess Louise Coil Grate" (No. 714). The registered offices of the Company are at 16, New Broad-street, E.C.

##### The Memorial to Lord Shaftesbury.

The marble statue intended to perpetuate the memory of this distinguished philanthropist has been placed in a commanding position near the western door of Westminster Abbey. The statue is the work of Mr. J. E. Boehm, R.A., and was executed from a bust by the same artist, which was finished from life a few years before his lordship's death. He is represented in the robes of the Garter in a contemplative attitude, with his hands clasped in front. The statue is about 8 ft. 6 in. in height, and is placed upon a marble pedestal, similar to most of those erected during recent years in the Abbey, and from designs by the late Sir Gilbert Scott, R.A. It is said by his family and by others who were intimately acquainted with him to be a very striking and happy likeness. The pedestal bears the following inscription suggested by the Dean of Westminster:—

Antony Ashley Cooper,

SEVENTH EARL OF SHAFTESBURY, K.G.

BORN, APRIL 28, 1801.

DIED, OCTOBER 1, 1885.

ENDURED TO HIS COUNTRYMEN  
BY A LONG LIFE SPENT IN THE CAUSE  
OF THE HELPLESS AND SUFFERING.

"LOVE. SERVE."

(the two latter words being the well-known family motto of the Shaftesburys). The second portion of the memorial has been entrusted to Mr. Alfred Gilbert, A.R.A., and will take the form of a bronze fountain, both drinking and playing; it will illustrate in a series of panels Lord Shaftesbury's life work. As soon as the model is sufficiently advanced, it will be placed *in situ* for the inspection of the public. The committee are not without hope that the artist's merit as well as the utility of this work will secure for it a site in Piccadilly-circus, at the entrance of Shaftesbury-avenue. A sea-side country home for poor and convalescent children would form a fitting supplement to the above memorials, and would, it is thought, be such a memorial as the great philanthropist himself would have selected could he have made the choice. The committee desire to obtain in possible suitable premises, healthily situated, and sufficiently large to accommodate under good sanitary conditions some fifty or sixty children, to whom a few weeks' residence in such a home would be a great and permanent boon. It is calculated that if the Government give the metal required for the fountain, about £1,000 will remain in the hands of the treasurer, after paying for the memorials already described, towards the purchase of a house for this purpose. If this amount could be augmented by generous friends it would add to both the usefulness and interest of such an institution, and bring increased blessing and happiness to many a poor and neglected child. Mr. H. R. Williams, of 6, Lime-street, E.C., the hon. sec. to the Shaftesbury Memorial Committee, will be glad to hear from friends desirous to help on this project.

**The English Iron Trade.**—With the exception of pig-iron, in which there has been a slight giving way in prices, the English iron market generally is just as firm and steady as it has been for some time past. Owing to the irregularity and flatness of the Glasgow warrant market, some brands of Scotch makers' iron have dropped another 6d. a ton. Middlesbrough iron has also suffered to a like extent, but Bessemer iron remains steady in the North-West at last week's quotation. Lancashire pig-iron remains strong, whilst in Staffordshire and East Worcestershire the pig-iron market continues firm. Owing to the great activity in the finished iron trade, manufactured iron still shows an upward tendency. Marked bars have been advanced 10s. a ton, whilst crown bars are fully from 2s. 6d. to 5s. a ton dearer. Black sheets are also 5s. higher. Tin plates continue firm in price, notwithstanding that the trade is not very brisk just now. Steel is taking another upward turn, in sympathy with finished iron, and the quotations of nearly all steel materials have risen in the North-West. Shipbuilders continue to receive new inquiries, and about double the tonnage is under construction compared with this time last year. Engineers have a good current of fresh orders.—Iron.

**Building land at Crouch End.**—It will be noticed from our advertising columns that Messrs. E. E. Croucher & Co., of Chancery-lane, are about to offer by auction some freehold building land at Crouch End.



**Properties for Sale.**—An estate of 3,400 acres near to Kingston, a large market for Welsh produce, on the western confines of Herefordshire, in the old honour and manor of Winton. The several lots lie in Lyonshall, Key, Kingston, and Stanton-on-Arrow parishes, the vicinity of two railway stations, and the arch line from Leominster to Kingston. A ranch of 250 acres and seven farms are on land; the various holdings yielding an annual rental of 3,150*l.* Here is good shooting, and the Arrow is justly famed for its fish. Lyonshall Castle, built by William II. the year 1090, was demolished in the reign of Edward II. The ruins lie by a graveyard of St. Michael and All Angels' church, which was re-opened, after restoration, in August, 1873. A few miles further westwards another lot—the Bwlch Farm, near to Colva, some building and accommodation land in the town of Winton. Also the sporting estate of St. Somerton, lying between Winterton (on sea-coast) and Martham, about nine miles from Yarmouth, and near to the Norfolk roads. Together with Burnley Hall and its lands of 382 acres will be sold certain estates and farms covering about 1,130 acres in all. Hales, the Norfolk giant, a native of this parish, lies in the churchyard of St. Mary, at Somerton. The church has been lately renovated, when some interesting wall-paintings were found. Here, *temp.* Henry II., Sir Ralph Granville, Lord Chief Justice, founded a hospital for lepers.

**The Sanitary Institute.**—The first meeting of the Council of this society, which has recently been incorporated, was held at the Museum on the 5th inst. The Institute was founded to carry on the objects of the amalgamated Sanitary Institute of Great Britain and the Parkes Museum. Sir Douglas Galton, B., F.R.S., was unanimously appointed chairman, and Mr. G. J. Symons, F.R.S., the secretary. H.R.H. the Duchess of Albany and H.R.H. the Duke of Cambridge have consented to become members of the Institute. The Marquis of Ripon, Earl Derby, Earl Bathurst, Count Cranbrook, the Bishop of London, Lord Elbury, Lord Mount-Temple, and 870 other lords and Associates were enrolled. An important letter was read from the Charity Commissioners, saying that they considered the new Institute was likely to prove a powerful means for the diffusion of sanitary knowledge, and promising to grant facilities to the Institute to deliver lectures in the various districts which the Commissioners proposed to publish in different parts of London. It was decided to hold the Institute's first examination on November 8 and 9. A programme of lectures for the winter session is in course of preparation.

**Improvements in Berlin.**—The Municipality of Berlin are contemplating some external improvements and the erection of several public buildings in their city. Among the latter are a large central National Museum, an Academy of Art and Science, and a new House; and among the former, the raising of the present rookeries along the Spree, thereby increasing the Royal Palace a free view of the river from the Linden, and the laying out of fine, broad streets in this locality. The new Cathedral, so long contemplated, will also shortly be begun. Last year 600 new houses were built in Berlin, most of them three or four storeys in height, whilst 550 old ones were pulled down. Less than 7,277 building licences were granted, of which 1,025 referred to new suburbs. Motto of the city of Berlin, by the way, is *Urbs in Urbe*.

**Archimedes Discounted.**—Such is the heading which the *New York Herald* of the 11th ult. puts to the following telegram:—Chicago, Ill., Sept. 24, 1888.—The mammoth McCormick Building, at the corner of Jackson and Market streets, on the river, six stories in height, and covering half a block, has been let 6 ft. to correspond with the grade of the viaduct just built on Jackson-street. The brick structure, weighing many thousands of tons, was raised by means of jack-screws, and a piece of mortar was displaced in the operation.

**Wood Green Local Board.**—The newly-elected Local Board for Wood Green met for the first time on the 3rd inst., when Mr. Littler, M.P., was elected chairman. Mr. J. F. Adams was appointed Clerk *pro tem.*, and it was agreed to ask Mr. Henry Robinson, C.E., of Westminster, to undertake the engineering supervision of the district at the outset.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |           | £. | s. | d. | £. | s. | d. |
|----------------------------------------------|-----------|----|----|----|----|----|----|
| Teak, E.I.                                   | load      | 8  | 0  | 0  | 12 | 10 | 0  |
| Sequoia, U.S.                                | foot cube | 0  | 2  | 3  | 0  | 3  | 0  |
| Birch, Canada                                | load      | 2  | 15 | 0  | 4  | 15 | 0  |
| Fir, Daintic, &c.                            | load      | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                          | load      | 2  | 0  | 0  | 4  | 10 | 0  |
| Canada                                       | load      | 4  | 0  | 0  | 6  | 10 | 0  |
| Pine, Canada red                             | load      | 2  | 10 | 0  | 3  | 10 | 0  |
| Do. " yellow                                 | load      | 2  | 10 | 0  | 4  | 0  | 0  |
| Lath, Daintic                                | fathom    | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                               | load      | 5  | 0  | 0  | 8  | 0  | 0  |
| Wainscot, Odessa, crown                      | load      | 2  | 10 | 0  | 3  | 0  | 0  |
| Deals, Finland, 2nd and 1st, ad. 100         | load      | 9  | 0  | 0  | 10 | 0  | 0  |
| " 4th and 3rd                                | load      | 7  | 0  | 0  | 9  | 0  | 0  |
| Rigs                                         | load      | 7  | 0  | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow                   | load      | 9  | 10 | 0  | 15 | 0  | 0  |
| " 2nd " "                                    | load      | 9  | 0  | 0  | 10 | 0  | 0  |
| " white                                      | load      | 7  | 10 | 0  | 10 | 0  | 0  |
| Swedish                                      | load      | 7  | 10 | 0  | 16 | 0  | 0  |
| White Pine                                   | load      | 8  | 10 | 0  | 17 | 0  | 0  |
| Canada, Pine 1st                             | load      | 18 | 0  | 0  | 25 | 0  | 0  |
| " 2nd                                        | load      | 10 | 10 | 0  | 17 | 0  | 0  |
| " 3rd, &c.                                   | load      | 7  | 10 | 0  | 10 | 0  | 0  |
| " Spruce, 1st                                | load      | 9  | 0  | 0  | 10 | 0  | 0  |
| " 2nd                                        | load      | 7  | 0  | 0  | 8  | 10 | 0  |
| New Brunswick, &c.                           | load      | 6  | 10 | 0  | 8  | 0  | 0  |
| Battens, all kinds                           | load      | 5  | 10 | 0  | 12 | 0  | 0  |
| Flooring Boards, sq., 1 in., prepared, First | load      | 0  | 11 | 0  | 0  | 14 | 6  |
| Second                                       | load      | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities                              | load      | 0  | 5  | 6  | 0  | 7  | 9  |
| Cedar, Cuba                                  | load      | 0  | 0  | 3  | 0  | 0  | 3  |
| Honduras, &c.                                | load      | 0  | 0  | 0  | 0  | 0  | 0  |
| Australian                                   | load      | 0  | 2  | 0  | 0  | 3  | 0  |
| Mahogany, Cuba                               | load      | 0  | 0  | 4  | 0  | 0  | 6  |
| St. Domingo, cargo average                   | load      | 0  | 0  | 4  | 0  | 0  | 6  |
| Mexican                                      | load      | 0  | 0  | 4  | 0  | 0  | 6  |
| Tobacco                                      | load      | 0  | 0  | 4  | 0  | 0  | 6  |
| Honduras                                     | load      | 0  | 0  | 4  | 0  | 0  | 6  |

| TIMBER (continued). |      | £. | s. | d. | £. | s. | d. |
|---------------------|------|----|----|----|----|----|----|
| Box, Turkey         | foot | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian     | foot | 0  | 0  | 4  | 0  | 0  | 6  |

| METALS.                    |     | £. | s. | d. | £. | s. | d. |
|----------------------------|-----|----|----|----|----|----|----|
| Iron—Bar, Welsh, in London | ton | 4  | 17 | 6  | 5  | 0  | 0  |
| " " at works in Wales      | ton | 4  | 7  | 6  | 4  | 10 | 0  |
| " Staffordshire, in London | ton | 5  | 5  | 0  | 6  | 15 | 0  |

| COPIES.                 |     | £. | s. | d. | £. | s. | d. |
|-------------------------|-----|----|----|----|----|----|----|
| British, cake and ingot | ton | 80 | 0  | 0  | 81 | 0  | 0  |
| Best selected           | ton | 81 | 10 | 0  | 82 | 0  | 0  |
| Sheets, strong          | ton | 88 | 0  | 0  | 0  | 0  | 0  |
| Chill, bare             | ton | 79 | 10 | 0  | 0  | 0  | 0  |

| LEAD.                  |     | £. | s. | d. | £. | s. | d. |
|------------------------|-----|----|----|----|----|----|----|
| Pig, Spanish           | ton | 14 | 10 | 0  | 0  | 0  | 0  |
| English, common brands | ton | 14 | 15 | 0  | 0  | 0  | 0  |
| Sheet, English         | ton | 15 | 15 | 0  | 0  | 0  | 0  |

| SILICA.           |     | £. | s. | d. | £. | s. | d. |
|-------------------|-----|----|----|----|----|----|----|
| Silesian, special | ton | 19 | 5  | 0  | 19 | 7  | 6  |
| Ordinary brands   | ton | 19 | 0  | 0  | 19 | 2  | 6  |

| TIN.               |     | £.  | s. | d. | £. | s. | d. |
|--------------------|-----|-----|----|----|----|----|----|
| Straits            | ton | 101 | 10 | 0  | 0  | 0  | 0  |
| Australian         | ton | 101 | 10 | 0  | 0  | 0  | 0  |
| English Ingots     | ton | 105 | 0  | 0  | 0  | 0  | 0  |
| Zinc—English sheet | ton | 22  | 10 | 0  | 23 | 10 | 0  |

| OILS.           |     | £. | s. | d. | £. | s. | d. |
|-----------------|-----|----|----|----|----|----|----|
| Linseed         | ton | 19 | 10 | 0  | 19 | 15 | 0  |
| Cocunut, Ceylon | ton | 26 | 0  | 0  | 27 | 10 | 0  |
| Ceylon          | ton | 25 | 5  | 0  | 25 | 10 | 0  |

| PAINTS.                |     | £. | s. | d. | £. | s. | d. |
|------------------------|-----|----|----|----|----|----|----|
| Palm, Lagos            | ton | 23 | 5  | 0  | 23 | 0  | 0  |
| Repsened, English pale | ton | 28 | 10 | 0  | 0  | 0  | 0  |
| " brown                | ton | 27 | 0  | 0  | 27 | 5  | 0  |
| Cottonseed, refined    | ton | 21 | 15 | 0  | 22 | 0  | 0  |

| TALLOW AND OILS.  |     | £. | s. | d. | £. | s. | d. |
|-------------------|-----|----|----|----|----|----|----|
| Tallow and Oleine | ton | 19 | 0  | 0  | 45 | 0  | 0  |
| Lubricating, U.S. | ton | 4  | 0  | 0  | 6  | 0  | 0  |
| " refined         | ton | 7  | 0  | 0  | 12 | 0  | 0  |

| TURPENTINE.        |        | £. | s. | d. | £. | s. | d. |
|--------------------|--------|----|----|----|----|----|----|
| American, in casks | cwt.   | 1  | 12 | 3  | 0  | 0  | 0  |
| Turkey             | cwt.   | 1  | 1  | 0  | 0  | 0  | 0  |
| Stockholm          | barrel | 1  | 1  | 0  | 0  | 0  | 0  |
| Archangel          | barrel | 0  | 11 | 0  | 0  | 11 | 6  |

## COMPETITIONS AND CONTRACTS.

Epitome of Advertisements in this Number.

## COMPETITIONS.

| Nature of Work.                         | By whom required.          | Premium.          | Designs to be delivered. | Page. |
|-----------------------------------------|----------------------------|-------------------|--------------------------|-------|
| Laying out Property as Pleasure Grounds | Penzance Town Council      | 20 gs. and 10 gs. | Oct. 30th                | ii.   |
| Wallace and Bruce Memorial              | Edinburgh Magistrates, &c. | Not stated        | Not stated               | ii.   |

## CONTRACTS.

| Nature of Work, or Materials.             | By whom required.              | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------|--------------------------------|-----------------------------------|--------------------------|-------|
| Blue Guernsey or Cleve Hill Granite       | Wood Green Local Bd.           | Official                          | Oct. 17th                | ii.   |
| Bridge and Approaches, Goods Station, &c. | L. & N. W. Ry. Co.             | do.                               | do.                      | ii.   |
| Underground Drains and Water-Closets, &c. | Commis. of Sewers              | do.                               | Oct. 18th                | ii.   |
| Sewerage Works, Isle of Man               | Ramsey Town Commrs.            | J. Mansergh                       | Oct. 22nd                | ii.   |
| Repairs of Private Road                   | Croydon Corporation            | Official                          | Oct. 23rd                | x.    |
| Road Making and Paving Works              | Hammersmith Vestry             | H. Malr                           | Oct. 24th                | x.    |
| Works, Repairs, &c.                       | War Department                 | do.                               | do.                      | ii.   |
| Receptacles for Dust, Refuse, &c.         | Lambeth Vestry                 | do.                               | Oct. 25th                | ii.   |
| Block of Buildings                        | Vestry of St. Giles, Cambridge | do.                               | Oct. 31st                | ii.   |
| Works and Repairs to Buildings            | Com. of H. M. Works            | P. B. Whellock                    | Nov. 2nd                 | ii.   |
| Terrace Walls, Shelter Hall, &c.          | Brighton Town Council          | Official                          | Nov. 15th                | ii.   |
| Alterations and Improvements to Schools   | School Bd. for London          | do.                               | Not stated               | x.    |
| Annual Repairs to Buildings and Furniture | National Prov. Bank of England | do.                               | do.                      | x.    |
| Superstructure of New Banking Premises    | do.                            | A. Waterhouse                     | do.                      | ii.   |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

| BIRMINGHAM.—For the erection of a house at Berr Green, near Birmingham, for Mr. C. F. Milward. Messrs. Jethro A. Cousins & Peacock, architects, 83, Colmore-row, Birmingham. Quantities by Mr. George Kenwick:— |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| W. Sapcote & Sons, Birmingham                                                                                                                                                                                   | £1,788 0 0 |
| W. & J. Webb, Birmingham                                                                                                                                                                                        | 1,760 0 0  |
| James Moffat, Birmingham                                                                                                                                                                                        | 1,743 0 0  |
| Gowing & Ingram, Birmingham                                                                                                                                                                                     | 1,595 0 0  |
| J. Barnley & Sons, Birmingham                                                                                                                                                                                   | 1,480 0 0  |
| J. Smith & Sons, Birmingham                                                                                                                                                                                     | 1,416 0 0  |
| G. H. Hulse & Sons, Redditch                                                                                                                                                                                    | 1,400 0 0  |
| * Accepted.                                                                                                                                                                                                     |            |

| CARDIFF.—For repairs to Atlas Works, Canton. Mr. Wm. Eves, architect, 10, Union-court, Old Broad-street, E.C.4.— |          |
|------------------------------------------------------------------------------------------------------------------|----------|
| O. Parnell                                                                                                       | £230 0 0 |
| C. Bird                                                                                                          | 200 0 0  |
| W. Symonds                                                                                                       | 195 10 0 |
| C. C. Dunn (accepted)                                                                                            | 189 0 0  |
| [All of Cardiff.]                                                                                                |          |

| DALSTON.—For making alterations to the Refreshment and Dining Rooms at Dalston Junction Railway Station, for Messrs. A. Probyn & Co. Mr. J. W. Brooker, architect.— |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Croaker                                                                                                                                                             | £432 0 0 |
| Gurratt & Son                                                                                                                                                       | 397 0 0  |
| Gurratt & Son                                                                                                                                                       | 383 0 0  |
| Spencer & Co. (accepted)                                                                                                                                            | 368 0 0  |

| ELING (near Southampton).—For converting a large store into a steam roller flour mill, for Messrs. Neave & Co. Mr. Fred Bath, architect, Salisbury. No quantities.— |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| H. J. Sanders Southampton                                                                                                                                           | £1,483 0 0 |
| H. J. Kite Salisbury                                                                                                                                                | 1,303 19 0 |
| Webb & Co. Salisbury                                                                                                                                                | 1,282 5 1  |
| Chas. Mitchell, Woodfalls, Salisbury (accepted)                                                                                                                     | 1,175 10 7 |

| HAMMERSMITH.—For additions and repairs to three houses, St. Peter's-square, Hammersmith. Mr. Frederick Los, architect, Buckingham-street, Strand:— |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| J. B. Gerrans                                                                                                                                      | £1,430 0 0 |
| Adams & Son (accepted)                                                                                                                             | 1,150 0 0  |
| Engineer's Work.                                                                                                                                   |            |
| H. C. Price & Co. (accepted)                                                                                                                       | £193 10 0  |

| LEWISHAM.—For new machine (bakery) and stabling at Riverside Mills, Lewisham, for Mr. John Wallis. Mr. Horace T. Bonner, architect, 29 and 30, King-street, Chesham, and Lewisham. |            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Kirk & Randall, Woolwich                                                                                                                                                           | £1,535 0 0 |
| Jerrard, Lewisham                                                                                                                                                                  | 1,494 0 0  |

| LONDON.—For the erection of three houses and warehouse in Lewin-road, Stoke Newington, for Mr. A. Hart. Mr. Wm. Eves, architect, 10, Union-court, Old Broad-street, E.C.4.— |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| J. Holloway                                                                                                                                                                 | £3,897 0 0 |
| Atherton & Latta                                                                                                                                                            | 3,375 0 0  |
| Higgs                                                                                                                                                                       | 2,990 0 0  |
| Holliday & Greenwood                                                                                                                                                        | 2,977 0 0  |
| Stimpson & Co.                                                                                                                                                              | 2,930 0 0  |
| Johnson                                                                                                                                                                     | 2,912 0 0  |
| Holland                                                                                                                                                                     | 2,898 0 0  |
| Gould & Brand                                                                                                                                                               | 2,885 0 0  |
| Anley                                                                                                                                                                       | 2,860 0 0  |
| Harris & Wardrop                                                                                                                                                            | 2,838 0 0  |
| Godfrey & Son                                                                                                                                                               | 2,793 0 0  |
| Jackson & Todd, 189, Hackney-road, E. (accepted)                                                                                                                            | 2,735 0 0  |
| Dabbs                                                                                                                                                                       | 2,697 0 0  |

\* Withdrawn in consequence of the increased price of materials between date of tender and its acceptance—viz., seven weeks.

| LONDON.—For re-building the "Duke of York" public house, Queen-street, Edgware-road, W. Mr. J. W. Brooker, architect, 13, Railway-approach, London Bridge, S.E.1.— |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Garratt & Son                                                                                                                                                      | £2,520 0 0 |
| Battley                                                                                                                                                            | 2,495 0 0  |
| W. Downs                                                                                                                                                           | 2,498 0 0  |
| W. & F. Croaker                                                                                                                                                    | 2,419 0 0  |
| J. Beale                                                                                                                                                           | 2,190 0 0  |

| Second list, after reductions made in the work. |            |
|-------------------------------------------------|------------|
| Garratt & Son                                   | £2,375 0 0 |
| Battley                                         | 2,348 0 0  |
| Barnman & Son                                   | 2,290 0 0  |
| W. & F. Croaker                                 | 2,260 0 0  |
| Spencer & Co.                                   | 2,240 0 0  |
| J. Beale                                        | 2,080 0 0  |
| G. J. Kirk (accepted)                           | 1,995 0 0  |

LONDON.—For proposed additions to store buildings in Finsbury-park, for the Metropolitan Board of Works, Mr. Thomas Blashill, architect. Quantities not supplied.

|                  |          |
|------------------|----------|
| Russell.....     | £483 0 0 |
| Teward.....      | 450 0 0  |
| Dabbs.....       | 444 0 0  |
| Harris.....      | 415 0 0  |
| Lapthorn.....    | 397 0 0  |
| F. Handford..... | 387 0 0  |
| Times.....       | 305 0 0  |

LONDON.—For gas services and fittings to "The Mercer Arms" and houses adjoining in Castle-street and Mercer-street, Long-acre, for Messrs. Coombe & Co., Limited. Mr. B. Elton, architect, 115, Long-acre, W.C. —

|                                                                                                                                          |           |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| Buckley & Bech.....                                                                                                                      | £129 10 0 |
| Comyn Ching & Co. (accepted).....                                                                                                        | 111 8 6   |
| LONDON.—For making up metallizing, &c., of Highlever-road and Stoneleigh-street, for the Vestry of Kensington, Mr. W. Weaver, surveyor:— |           |
| Tomes & Wimpey.....                                                                                                                      | £284 0 0  |
| Nowell & Robson.....                                                                                                                     | 257 0 0   |
| Mears.....                                                                                                                               | 230 0 0   |
| Rogers & Co. (accepted).....                                                                                                             | 202 0 0   |

LONDON.—For pulling down and rebuilding the "Railway Bell," George-lane, Woodford, for Mr. W. Davies. Mr. Wm. Ansell, architect:—

|                        |            |
|------------------------|------------|
| W. M. Dabbs.....       | £3,450 0 0 |
| Godfrey & Son.....     | 3,390 0 0  |
| Ansell.....            | 3,285 0 0  |
| Godley (accepted)..... | 3,242 0 0  |

LONDON. For alterations and additions to the "Albion Tavern," Thornhill-road, Barnsbury, for Mr. A. Watson. Mr. Arthur F. Wrightson, architect. Quantities by W. Heals, 26, Budge-row, Cannon-street, E.C. —

|                             |            |
|-----------------------------|------------|
| Drew & Cadman.....          | £1,723 0 0 |
| Tatum.....                  | 1,659 0 0  |
| Pickford.....               | 1,604 0 0  |
| Kellaway.....               | 1,580 0 0  |
| Green & Lee.....            | 1,510 0 0  |
| Allen & Son (accepted)..... | 1,338 0 0  |

LONDON.—For alterations and additions to the "Golden Fleece," Essex-road, Islington, for Mr. H. Carter. Mr. Arthur F. Wrightson, architect, 26, Budge-row, Cannon-street, E.C. —

|                          |          |
|--------------------------|----------|
| Pickford (accepted)..... | £590 0 0 |
|--------------------------|----------|

LUTON.—For small detached house, High Town-road, for Mr. Thomas Barker. Mr. W. A. Fisher, architect, Hemel Hempstead:—

|                         |           |
|-------------------------|-----------|
| W. & A. Cox.....        | £374 10 0 |
| J. Parkins.....         | 337 10 0  |
| Wardle.....             | 295 0 0   |
| J. Long.....            | 280 0 0   |
| A. Long (accepted)..... | 239 0 0   |

[All of Luton.]

SALISBURY.—For alterations, additions, and re-seating the Wesleyan Chapel, Salisbury, for the trustees. Mr. Fred Bath, architect, Salisbury. No quantities.

|                                     |             |
|-------------------------------------|-------------|
| Jerrard & Stevens, Salisbury.....   | £1,710 10 0 |
| Webb & Co., Salisbury.....          | 1,627 2 9   |
| W. G. & C. B. Young, Salisbury..... | 1,588 7 8   |

\* Accepted.

SOLIHULL (Warwickshire).—For the erection of a house and stable buildings at Solihull, for Mr. George Matthews. Messrs. Jethro A. Cossins & Pascock, architects, 83, Colmore-row, Birmingham. Quantities by Mr. George Kenwick:—

|                             |                   |
|-----------------------------|-------------------|
| House.....                  | Stable Buildings. |
| J. Moffat,* Birmingham..... | £1,547 0 0        |
|                             | £207 0 0          |

\* Accepted.

SOUTHWARK.—For the erection of stabling, &c., for Mr. Burkill, in Friar-street, Southwark. Mr. J. W. Brooker, architect:—

|                               |          |
|-------------------------------|----------|
| Horswill.....                 | £185 0 0 |
| Garratt & Son (accepted)..... | 159 0 0  |

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# The Builder.

Vol. LV. No. 2385.

SATURDAY, OCTOBER 29, 1888.

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### M. César Daly on "Hautes Études."

**I**N a recent issue of the *Journal of the Proceedings of the Institute of Architects*, mention was made of a pamphlet which had been sent to the members of the Council of the Institute by M. César Daly, on "Des Hautes Études d'Architecture." The pamphlet is, in fact, a reprint of an article which appeared some time before the *Revue Générale de l'Architecture*, the class monthly, or quasi-monthly, *Journal of Architecture* (for its terms of periodicity somewhat abnormal and irregular) which was founded nearly fifty years ago by M. Daly, and has been carried on by him ever since.

The original article has the sub-title, "Un él à nos corps constitués et aux architectes dépendants"; and by his recent action in inaugurating it specially under the notice of the Institute of British Architects (and, we presume, under that of similar professional bodies in other countries), we may understand that the author is desirous to gain the co-operation of the architectural bodies of other countries in forwarding the idea in which he has already laboured to interest those of his own country. The appeal to his own country is especially made in regard to the great Exhibition in preparation for next year. In all niches of human knowledge, urges M. Daly, it is the "Hautes Études" which give tone and the direction to secondary and many studies. "Elles manquent encore à l'architecture." The world, it may be retorted, by way of an aside, has contrived to do some good bits of architecture without M. This, however, does not affect the question whether there is not a great deal to be done the way of scientific and methodical study so vast a subject as architecture, and, in summing this, M. Daly appeals to his countrymen who are architects and students of architecture to aid, in their way, in marking the year 89 by inaugurating a system of "Hautes Études," to which they are the rather urged the consideration that unless they take the subject up without delay and do justice to it, they may be anticipated, and the honour of inaugurating a new era be snatched from them.

The editor's son, M. Marcel Daly, is now associated with him in the management of the *Revue*.

by the architects of some more intellectually active nation.

The phrase "Hautes Études" is a somewhat vague one, as an interlocutor in the *Revue* suggests. He remembers that M. Duruy, Minister of Public Instruction during the last years of the Empire, founded a kind of institution of Hautes Études of History and Philosophy, and that there exists still an annual competition for an annually-awarded prize for "Hautes Études de l'Architecture," but he has never been able to understand precisely what Hautes Études meant. Will M. Daly kindly define? And in consideration of the weak brethren, M. Daly, though protesting that he thinks it can hardly be necessary for the greater portion of his professional brethren, suggests a definition as follows:—The Higher Studies in architecture have for their object to trace back to their fundamental truth all the facts—Historic, Æsthetic, Scientific, and Practical,—relating to the art of architecture. And in order to enter on a clearer practical definition of his meaning, the author takes one subject, architectural symbolism, and places in a series of short sentences all the questions which he considers have still to be answered on this one subject, and a very curious and suggestive catechism it makes, and a very effective point in favour of the writer's argument. You think you know enough about symbolism, do you? Well, how far can you answer this question about it, or this? How far can the civilised world answer it? To some points in this catechism we may return; we content ourselves just now with expressing our appreciation of this Socratic method of showing the necessity of "Hautes Études" in architecture, and drawing from the objector an admission of his ignorance as to many points in regard to one single subject in connexion with architectural expression, its powers, and its historical development.

This view of the subject of architectural study finds a congenial soil in France. The French have always been strongly impressed with the importance of "Hautes Études;" as some one said of them in a political sense, they are greatly under the domination of ideas. Their aim at an idea of government founded on logical principles, and ignoring the actual sway of facts, gave rise to the confusion and shaking up of all old political and social creeds which constituted the Revolution, and from which, no doubt, great things arose. Their dream of an idea of a perfectly pure and logical language gave rise to the

Académie Française, with its obstinate ignoring of the actual life of the language, its cold and rigid formalism, which has been so mercilessly satirised by Daudet in his recent novel, "L'Immortel." In a less marked degree, perhaps, but still very decisively, the general influence of the Académie des Beaux Arts has been towards that graceful, but cold, lifeless classicism in art and architecture which raised the life-long opposition of Viollet-le-Duc. The men who took or were given the name of Impressionists formed an extreme band of rebels against Academic law, carrying their opposition to further and more contemptuous lengths. But in France it is probable that M. Daly's able and striking appeal will still find a large number of sympathetic adherents; sympathetic in spirit if not in action. In England the answer, on the part of many readers, will no doubt be that, admitting that we are comparatively ignorant about many things in the history and development of architecture; that we have no logical theories at the basis of much of our design, &c.; there is no reason to think that better architecture would be produced by further and more systematic study in this direction of high æstheticism. The argument on this side will be that what we want, after all, is that architecture should be convenient for its purpose and picturesque and interesting in its design; that some of the most powerful, picturesque, and characteristic architecture in the world has been produced by men who probably had not a theory about art or æsthetics in their heads; and that experience has shown that a too formal and self-conscious basing of architectural design on intellectually-conceived ideals has generally tended to produce architecture correct and symmetrical indeed, but formal and uninteresting, and in which the design often was rather the mask than the expression of the practical objects of the building; a lifeless academic study instead of a piece of natural and expressive building.

There is, no doubt, a truth in this objection. The French themselves admit, if we are to accept such critics as M. Paul Sédille as fairly representing the opinion of the French architects of the day, that our domestic architecture is at present more varied, more picturesque, more full of life and interest than their own. In that particular field we are first at present; it is in domestic architecture especially that the qualities of picturesqueness and *laissez-faire*, which belong to our present fashion of architectural design, seem



in their place. It is to be feared that English architects cannot claim the same superiority which an eminent French architect has conceded to us in domestic architecture, when we come to some other classes of buildings. Look at some of our recent theatres, for instance. We find, not unfrequently of late, buildings of which the arrangements are very good and very practical, but of which the façades present absolutely no architectural quality worth notice or illustration. Anything seems good enough, provided the building answers its practical purpose. It may be doubted whether we could easily find a new theatre in the French capital of which the same could be said. We might not agree with the architect's taste in details, but we should be conscious of a distinct endeavour to produce a "design," not a mere "front," of a care and thought applied to the details from the designer's point of view of which we see little evidence in recent London buildings of the same class. There is another and a wider sense in which the French devotion to the æsthetics of architecture shows to advantage; in the willingness, namely, to subordinate mere money considerations to the desire of mastering what they regard as the higher part of the art. In that same novel of Daudet's, just referred to, the young architect, Paul Astier, shocks his father, who is a member of the Académie, by refusing to compete for the "Prix de Rome." He does not want that sort of thing, he says; he wants to get into practice. "What are you thinking of?" says old Léonard Astier. "Why, it means membership of the Institute, in time!" Poor old Léonard Astier was a pedant, but most readers would feel that he was a pedant with a kind of high ideal according to his light; he wanted his son to work for glory, not merely for money. Daudet, in spite of his castigation of the Académie, evidently had this feeling too; his Paul Astier is a youth essentially selfish and worldly. It appears to us that the feeling of subordination of business interests to higher interests is much more developed among the French architects than it is among us, and that the prevalence of this feeling is to a great extent due to the fact that they regard architecture as a matter of "Hautes Études" much more generally than is the case in England. Their "Hautes Études" no doubt, run in a too academical groove; but there is much to be said, nevertheless, for a view of the art which raises it above the region of business, and of the rapid providing of such a building as will meet the practical demands of an impatient client—above the region of mere planning, and contracting, and quantity-taking, into that of an intellectual study pursued for the sake of its own interest. We are not without those among us, young and old, who take this higher view; but we fear they are a smaller minority than in France; the standard has not been kept so high.

As to the fact, on which we glanced, that some of the most powerful architecture of the world has been produced at a time when it is unlikely that there should have been any refined thinking about architecture, we must not push the conclusion from that too far. The greatest works of the Medieval period are, at all events, not essentially of the "picturesque" order,—as that term is usually understood. They represent, probably, the best intellectual perception of the day, for that was the one form in which intellect had then its free expression; and their architects aimed at grandeur rather than at picturesqueness, the latter quality being often attributed to them, as old and time-worn works, to a degree in which we ourselves, perhaps, would not have attributed it had we seen them as new. As a general rule, mere fanciful picturesqueness, without any dominant central idea, is a quality which, in a building, is very much dependent for its effect upon association of time and place. The architectural work which has held its own more continuously than any other on the admiration of mankind is that of the Greeks; and all the evidence we have seems to point to the fact that the Greeks were eminently given to

"Hautes Études" in architecture. There is about the remains of their buildings a sense of every detail having been designed with reference to a principle, having been the object of intellectual consideration, which the remains of no other architecture impress us with to the same extent. The mistake made among the modern students of the art according to the creed of the École des Beaux-Arts appears to be that they place the study of the works of those who thought about architecture intellectually above the more important necessity of thinking intellectually for themselves, in turn, on the same principle. M. Daly has the boldness to state this clearly. In his own words:—"L'Institut ne remplit pas sa mission de conservateur des grandes traditions, de pondérateur des forces aveugles qui agitent le monde de l'art. Ses membres font tous de l'éclecticisme, et l'éclecticisme c'est le pillage et l'utilisation plus ou moins habile des vieux monuments," mais pas du tout la conservation des grandes traditions historiques et esthétiques"—and that is the truth in a nutshell, although the word "eclecticism" is used in a rather different and more strictly literal sense than that in which we generally use it. Our own latest "eclecticism," in this sense, has been the "pillaging" of the details of a corrupted and debased form of classic art; which is, after all, a poorer kind of eclecticism than that of the students of the Villa Medici, though in some hands it has shown itself suggestive of new developments.

No one would be ready to say, of course, that it is possible to deliberately think out a new development of architecture. But it is, perhaps, possible to pave the way for one, to point a path of future progress, by such an effort. It would have to be an intellectual effort long maintained, and often apparently fruitless, and the effects resulting from it would often not be apparent except to those who looked back upon them after they were accomplished. What induces us to think that M. Daly's ideal, ambitious even to audacity as it may seem, is not purely visionary, is that there is cause to believe that the Greeks really did elaborate their architecture in that way, as a work of intellectual study; and they left the most perfect architecture we know of: perfect within its scope and intentions. We have thought that our American relatives have recently shown a kind of effort at the same ideal, discarding imitation and proceeding to work out a style *ab initio*. They have not got very far as yet, but they appear to be the only modern people who are aiming at something of the kind, as seen in the works of their best architects; and if they advance in that path they may become our architectural teachers yet, after paying us the compliment of "pillaging," as M. Daly calls it, for several generations.

By way of giving some further idea of the line of study suggested by M. Daly, we may return for a moment to his exemplary subject, Symbolism, and the kind of inquiry which he suggests in regard to it. We cannot go through his questions, but among them are these: What have been the sources of symbolic forms? What do they owe to inorganic and organic nature? What to history, mythology, legend, poetry, religion, pure mysticism, or imitation of ancient suggest? Are there "symboles constants," common to all races, societies, and countries? (a very interesting inquiry.) Are there transitory symbols, arising out of special conditions and disappearing with those conditions? (Instances of the two last to be produced.) What is the origin of the symbols adopted in architecture, and what is the special symbolic system which characterises respectively the leading historic styles of architecture—Egyptian, Assyrian, Persian, Greek, Roman, Indian, Arabic, Byzantine, Gothic, &c.? These are by no means all, but there is a pretty fair ground for study here. One question has a practical application: "In an epoch of social transition like ours, where architecture is in search of its path and its style, what can be the symbolic system of its architecture?" We fear that is the kind of

\* The italics are our own.

question which cannot be answered by answers itself, but the answer is only and only to the next age.

Among the other questions which M. Daly proposes for investigation are such as these: The historic styles of architecture considered in regard to their origin, progress, and decadence, showing how each arose from a preceding style, and prepared the way for a succeeding one (this latter position is universally correct, by the way; it would be impossible to say that the decay of Gothic prepared the way for the Renaissance, except in the sense of leaving a void to be filled in some way); comparative architectural resemblances and differences between styles; the progress of the sciences considered in bearing on architecture; the progress of applied science considered in the same light. The last two suggestions we give in his own words.

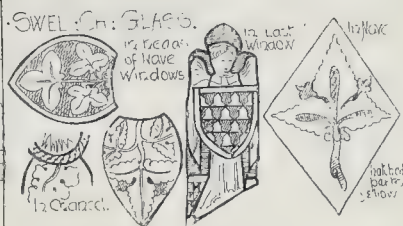
"7° L'influence sur l'architecture des progrès accomplis dans la grande circulation terrestre et maritime, et le développement, chaque jour plus accentué, du mouvement commercial financier."

"8° Etc., etc."

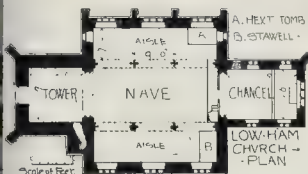
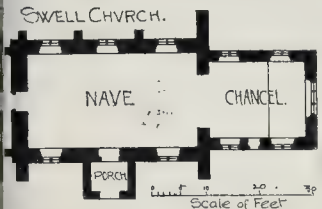
We like that "etc., etc." The programme of study sketched in this spirit could only be in the study of the relation of architecture to all things in heaven and earth and in the waters under the earth: for instance: "What effect has the saltness of the sea on architectural style?" What should be the characteristic distinction between the style of architecture on a sea-coast and the coast of a fresh-water lake? And we also might add, "etc., etc." Seriously, however, without the "etc.," M. Daly's paper holds out a prospect for almost endless study in regard to architecture, all of it of interest in itself, and throwing light on the history and meaning of architecture; but not all so far as we can see, bearing very directly on the main object he has in hand—that of placing architectural design and invention on a purely intellectual basis and entirely apart from the necessity of "pillaging," is this which would be the great aim, if there were any chance of accomplishing it, and it is about this that there will be most scepticism. No one questions the practicability of greatly extending the study of architectural history and design; but many will question the possibility of raising architectural design into an art based on purely intellectual conception. Nor do we think that is possible; the human intellect is constituted that it must have material to work on. *Ex nihilo nihil fit*. But architecture, especially in regard to detail, is a singularly refined and abstract form of artistic expression, entirely independent of imitation of external objects; dependent on very recent forms of intellectual suggestion of a material physical nature. As we have said, there is reason to believe that the Greeks did apply abstract reasoning to the treatment and evolution of architectural style and detail, and there has been little attempt at this since their epoch. Our French contemporary appeal to the leading members of the architectural profession to take up the study of architecture on this intellectual basis. The same sentiment among the architectural corporations of the day is, he says, very great, and should be devoted to this end, the combination of intellect in the "Hautes Études" of architecture and heaven suggests the idea, since international congresses are so common, of an international congress with a view of organising the "High Study" of Architecture. It is an ambitious—perhaps some may think it a chimerical—idea; but to aim high is to strike high. It would be at least an inspiring thing to a meeting of the most able men of the profession of all countries, not to discuss questions of a "Caisse de Défense Mutuelle" or of disputes about liability for errors in quantities, but for the consideration of architecture purely as an intellectual form of artistic expression; and the idea ought, at events, to be a congenial one to a society which, like our English Institute, was organized for "the advancement of the Art of Architecture."



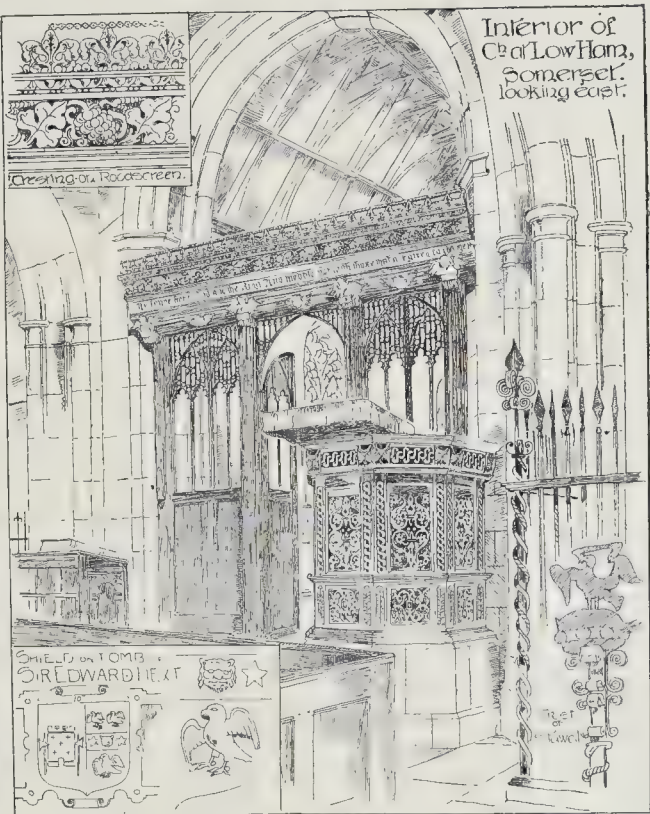
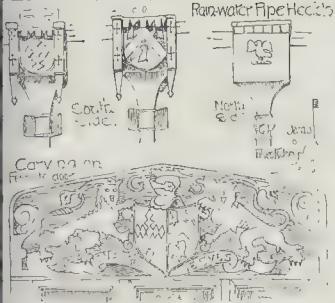
CHVRCH & COVRT,  
SWELL - SOMERSET.



SWELL CHVRCH.



LOW HAM CHVRCH



Interior of  
Ch of Low Ham,  
Somer. set.  
looking east.

TWO SMALL SOMERSET CHURCHES.

**A**MONGST the more imposing examples in which Somersetshire is so rich, there are scattered up and down the county several smaller, and of more unpretentious exterior, which yield a rich harvest of architectural detail inside. Such are many of the coast churches, and also those which happen to have been built near, and formed an adjunct to, the manor-house; churches which have perhaps been built by its occupants, and even their burial-place for successive generations. The interesting church of Brympton Pevery, near Yeovil, will at once occur to many as an example of this. Many of these churches have also been left much in their original state, partly, no doubt, by reason of their lying often out of the beaten track. The churches here illustrated are two somewhat notable examples. One is practically a perfect specimen of the fifteenth century, the other a remarkable instance of an attempt to revive Early styles in Jacobean times, and both have good plans. The first

—Swell—is about four miles west of Langport, on the Taunton-road. We give a small view and ground-plan. It lies, with the manor-house close by, at the bottom of the hill on which stands Burton Pyncent and its monument, and close to the edge of the moor. Walls of regular courses of lias, having plinths on the external faces, show pretty clearly the extent of the original surroundings of the house. The house has been a good deal pulled about, but still retains its windows and a good oak door. Like many others of its kind, it is now a farm; and a slate roof, of comparatively recent date, with eaves, probably takes the place of the former parapet. The churchyard is immediately east of the house, with the church in its centre. At first sight the fabric appears entirely Perpendicular in date. The nave walls, however, appear to have been re-used, and the Norman south doorway, font, and bowl of the piscina in the chancel, have been retained. It is simple in plan,—a nave, south porch, chancel, and bell-turret over the west gable. The bell-turret seems late, an imitation of Early English examples, and containing two old bells. In

the Perpendicular period the church was almost entirely rebuilt. A fine four-light window was placed in the west wall, and four two-light windows, with quatrefoils in the heads, in the nave; four more of similar pattern, but rather smaller in size, being placed in the chancel, and an east window of three lights. All these windows were filled with stained glass, a good deal of which remains. The lights of the nave windows were filled with quarries having the usual conventional foliage (see sketch), with borders of coloured glass—red and blue—varied at intervals with lion's heads and crowns. The quatrefoils were treated differently, some with foliage only, others with the sacred monogram, a sun, and a rose in the centre. Those in the chancel have suns and roses alternately. In the east window the tracery in the upper portion was occupied by four angels, with shields of arms. One only remains with the arms of the Beauchamp family—*vairé, within a bordure gules*. On the floor immediately in front of the step to the sanctuary is the matrix of a brass—a figure in centre and a shield in each corner. The brasses were at no distant period



in the church chest, but have been removed. It is not mentioned by Haines in his book on brasses. Possibly it commemorated one of the Beauchamps, to whom the manor belonged. There are high pews, a Jacobean pulpit with some good panels, and some seats in the nave which, from their general design, may very possibly date from the time of the remodelling in Perpendicular times. The church is in a sad state of neglect, and the south wall is much out of the perpendicular, and if not shortly looked to will probably fall and ruin the building.

The second example, Low Ham Church—or "chapel," as it is sometimes called,—is about two miles north of Langport. We give a plan of it and a view of the interior. On approaching it the building looks peculiar, from the fact of its standing in a field which is some acres in extent, and, as at Swell, having extensive blue lias walls carefully built in regular courses, marking the ancient boundaries. It was also the chapel attached to the manor-house, but has been built in imitation of larger churches, with clerestory and aisles to the nave, and a western tower. At first sight it appears much earlier than it is. Most of the window-tracery takes geometrical forms, and the east window has a very elaborate form of "wheel" tracery in the head. The architect seems to have gone out of his way to confuse the details of various styles, but he has certainly produced, especially in the interior, a very charming effect.

There were two families residing here, the Hexts and the Stawells. Of the Hext manor-house nothing seems left, unless perhaps an old house west of the church contains a portion of it. The Stawell mansion was begun on a large scale and never completed, and extensive remains of this building are still to be seen north of the church. On the outside of the clerestory are four good rain-water pipes, their heads (see sketch) being ornamented on the south side with the arms of Sir George Stawell and his wife, and on the north with an eagle, which occurs on the tomb of Sir Edward Hext. From this and from the position of the tombs inside it may be inferred that the north was the "Hext aisle" and the south the "Stawell aisle." A door was apparently made on the north side of the chancel by Sir George Stawell, probably in connexion with his house, and the door-head is filled with his arms and supporters, and the letters G. S. On a scroll below the shield is the Stawell motto, "En Parole je sues." This door, as well as those on the west side, and to tower stair, has some good simple ironwork.

The interior of the church (see illustration) is very interesting. The roof-screen remains, with a rich cornice, the carving being a curious mixture of Classic and Gothic detail. The tracery at the sides, though now railed up, was formerly made to open in two parts, like the doors, thus giving a better view of the altar from the body of the church. The curious inscription on the west face of the screen may possibly have been meant as a faint reminder of that battle of 1645 which was fought within a few miles of the church. The church, as a whole, indicates "the tendency of the High Church and Royalist party, as contrasted with the opposite leaning of the Puritan element in the National Church at the time." The pulpit is elaborately carved, and the detail picked out in gold. It has been placed on a Ham stone base, and stands immediately in front of the screen at its southern end. The nave seats and prayer-desk are coeval with the pulpit, but are plainer in character. At the eastern ends of the aisles are the monuments to the Hexts and the Stawells. That in the north aisle commemorates Sir Edward Hext and his "virtuous lady," who died respectively February 22, 1624, and July 30, 1633. Two effigies recline on an altar-tomb with panelled sides, having the arms impaled on a shield in the centre. Sir Edward is in plate armour of the period, his head on a tilting-helmet ornamented with a plume of feathers. His wife has the usual ruffs round the neck and


wrists, and wears one of the varieties of the French hood which were fashionable from the days of Elizabeth. These effigies are in fine preservation, and from the care and delicacy of the carving are probably faithful portraits of the deceased. The whole is surrounded by a wrought-iron railing of plain character.

In the corresponding position on the south side is the monument to Radolph Stawell, Baron Somerton, who died August 8, 1689, and his wife. It is a heavy mural monument of no particular artistic excellence, but is surrounded by a good wrought-iron railing, the centre being finished with the Stawell crest on a cap of maintenance. The east window is the only one which retains its original glass. Some cherubs in the wheel portion of the window-head are very beautifully drawn. A chair, apparently "made up," stands in the chancel, and has some good carving.

The nave arcade is of three bays with four centred arches, and imitation of Early mouldings in the abaci of the caps. Both arches and shafts are the same in section. On the exterior there are no buttresses or plinth on the south side, the reason probably being that it was only finished on the side facing the approaches from the house and road. As the ground slopes upwards considerably from north to south, the extra support was dispensed with on that side.

Not far distant is the more elaborate church of High Ham, which is also well worth visiting for its screen and painted roofs.

#### NOTES.

 print in another column a letter from Mr. Wyatt Papworth concerning the addition of a gallery round the Rotunda Room at the Bank of England, under the dome, and cutting across the niches which formed part of Soane's architectural scheme. He asks, "What is the use of having good work in a city, if it is to be damaged in this manner?" Without feeling too much enthusiasm for Sir John Soane's niches, which are not a very reconducive form of architectural expression, we certainly consider that the Bank of England is a sufficiently notable and, in its way, unique architectural monument, to make it a matter of some importance that its design should not be interfered with or altered without very decided practical necessity. From inquiries at the Bank we learn that the gallery is absolutely wanted for the storage of books; it does cut across the niches, and is to have a light iron railing of simple and graceful design round it. If the space is wanted for the business of the Bank, and cannot be found anywhere else, we presume there is no help for it; but it seems a pity that the addition could not have been managed so as to fall in with the design of Soane's Room, in arrangement and character of detail, instead of interfering with it.

A FEW days ago we read a remark in the *Athenaeum* to the effect that—

"Visitors to Westminster Abbey now find themselves barred out from the chapel of St. Paul, on the north side of the apex, and the place carefully screened with sacking lest they should see into it. This is to prevent them missing the tomb of Sir Giles Daubeny, one of the most interesting, after the royal tombs, in the church. It has been pulled down and taken away, and a new one is being made to put in its place. This is no ordinary piece of barbarism. It is the first attack of the 'restorers' upon that marvellous store of old English monumental art which has made Westminster Abbey famous amongst the churches of the world, and the like of which no other country can now show."

Now, the zeal of our esteemed contemporary has certainly run away with its discretion in speaking so strongly. We have been at the trouble to ascertain the facts from those best able to give them. It appears that the representatives of the Daubeny family have been desirous for some time to repair the tomb, which they considered to be in a very un-

satisfactory and neglected condition. The surfaces on the south and west end were so far decayed as to leave little trace of the details that had been on them. The tomb was originally designed for an effigy only, that of Lady Daubeny, but after Sir Giles's death it had to be taken to pieces for his burial within it, and then her effigy to be moved to one side to make room for him and the re-building of the tomb was very clumsily done. The first intention was to re-work the details on the old sides and end, resetting them in their proper positions; but they were found to be too much decayed to allow of this. The old verge or slab will, however, be replaced with the two effigies on it without any alteration, and all existing traces of the ancient colouring on them will remain untouched. The railing which surrounded the tomb was removed not many years ago, when many other tombs were deprived of their iron fencing; but an accurate drawing of this railing exists which will guide the preparation of a new one. It is intended to place an inscription with the date on this railing to describe what has been done to this tomb, and the greatest pains will be taken to prevent any possibility of confounding what is new work with what is old. Can more be expected? Does our contemporary mean to assert that the modern representatives of a ancient family are not justified in repairing and re-embellishing the monuments of their ancestors? That is what has generally been considered to be a pious work. We quite agree with the *Athenaeum* that if restoration "is allowed to run riot amongst the monuments in Westminster Abbey," the result would be deplorable; but is such a treatment of an ancient tomb as we have described to be called "restoration running riot"? This is the way the opponents of restoration too often injure their own cause by making out things to be worse than they really are.

WE have received a copy of Dr. Blaxall's report to the Local Government Board on an epidemic of diphtheria in the Urban Sanitary District of Midsomer Norton, Somersetshire. We propose to give publicity to the stated causes of disease, as briefly as may be, in any such reports which are sent to us, so that those of our readers who are practically interested in sanitary progress may have information as to places where sanitation is neglected. We give the following quotations from Dr. Blaxall's report:—

"The village of Midsomer Norton, with which this report is more concerned, stands on a red marl in a valley, having a wide brook, the 'Somer,' running down the side of the main street. The water supply is derived chiefly from springs at Chilcompton, the water being brought down by gravitation and pretty generally distributed throughout the village. I met, however, with instances where the families were dependent upon wells for drinking water, or upon springs which, in the hot season, were liable to run dry; as, for example, at Clay Batob, where the occupants of several dwellings are put to great straits in the summer to get water for their daily use. Some of the wells are evidently exposed to dangerous pollution, as at Radstock Villas, where the water is derived from a well sunk about 12 ft. or more from a privy cesspit; and again, at Gunning's Houses, where a butt-ended stop drain runs close to the well. Excrement removal and disposal are mainly effected by sewers, but the drains of closets are habitually unprovided with means for flushing, except by thread-labour, and this is not infrequently neglected, with the customary result of blocking the drains with decomposing excrement. Further bad examples of cesspit privies came under notice in the village and elsewhere. The system of sewers consists of brick culverts and glazed pipes. These latter are laid with clay joints, and the Surveyor tells me the Authority are now experimenting with the sewers opening at the joints and taking in subsoil water. The sewage is disposed of by filtration, and the effluent water discharged into the brook, which then continues its course to Radstock, where the Radstock Authority complain that its polluted condition causes considerable nuisance. To remedy this evil the Midsomer Norton Urban Sanitary Authority applied to the Board for powers to borrow money to carry out projected improvements, and the Board has held inquiry on the subject. The ventilation of the sewers is very inefficient; when first laid down street ventilators were provided, but these have been done away with and 2-inch shafts substituted, and of these only seven have been provided for some two miles of



vara. Removal of house refuse is left to the householders to carry out, and is not infrequently neglected, as evidenced by the accumulations met with at various places in the course of my inquiry. The points we would draw special attention to in the above extract are the trouble caused by clay-jointing the drain-pipes (an old crusty receipt which is constantly producing ill effects); the leaving of the flushing of closets to hand labour; and the contiguity of the wells to drainage cesspools,—a piece of slow suicide so constantly practised in rural districts.

NEXTLY next month there will be opened, in the galleries of the Royal Scottish Academy, an exhibition of decorative handicraft. The scheme has the support of the Board of Manufactures and of other public bodies and private individuals connected with art and commerce, and its object is "to further, in a practical way, the education both of workers and the public, and so to promote purer taste and better application of what is really good in the important branches of industry that connect themselves with art." Prizes will be given for carving in wood, marble, stone, and plaster, metal work, mosaic, embroidery, painted decoration, bookbinding, turnery, &c. There will also be a loan collection of "standard examples in the various special forms of work in which competitions are held." Work submitted in competition must, in every case, be solely the work of the competitor, and originality of design will be considered in judging the merit of works submitted in competition. A series of lectures will be given bearing upon the objects of the exhibition, with, where possible, practical illustrations of the *modus operandi* of the workman. It is stated that several offers of excellent materials for the loan collection have been made, and there is every probability of the exhibition proving advantageous both to the handicraftsman and the public.

WE may draw attention to a letter in this week's issue, written by a member of the Architectural Association, under the signature "Apyctierus," urging the advisability of establishing a residential college for young architects who come up from the country to study in London. Some readers, we fear, will know very well what our correspondent means in regard to the dullness and depressing effect of life in London to those who come up to London for purposes of study, with no friends, and a very limited income. The establishment of a place of residence for such would probably tend to economy of resources, and would have the even more valuable result of giving the cheerfulness and interest in life arising from mutual society, in place of long, monotonous evenings in dull lodgings. The idea is certainly well worth practical consideration, and we hope the letter of our correspondent may lead to some useful result.

EACH new guide-book to Athens that appears is necessarily a small archaeological compendium. The guide "Johanne,"\* just published by Hachette, is no exception, and, as an archaeological compendium, it must briefly be noted here. We may at once say that, archaeologically, it stands midway between the now wholly obsolete Murray and the remarkably alert and complete Baedeker. Any one now starting for Greece will do well to read his Murray if he have time and money,—it is long and costly,—before he starts, he will thereby fill his mind with excellent references and abundant appropriate quotations, from Pausanias to Bishop Wordsworth. Then, if he fear the question of excess luggage, let him leave it behind. On the spot he will find it worse than useless. He must choose between the new Johanne and Baedeker,—either equally handy,—but Johanne contains Athens alone, Baedeker all

Greece proper. So many English-speaking tourists read French and not German that Johanne is sure of many purchasers; but let those who have their German keep to Baedeker. It is vexatious to find in 1888 a description of the Erechtheion based on Teyas's work in 1851. It is still more astonishing, when all archaeological Europe has been agog on the subject of the Dionysiac theatre, to find not so much as a hint of Dr. Dörpfeld's discoveries. Even the tourist, especially if he be an American, is annoyed not to be posted up as to the latest news. As the book is French, it is, perhaps, needless to add that the exposition even of complete errors is lucid, and the plans, even when inadequate, are lucid.

ADVERTING to the Note in our issue of the 29th ult. as to the alterations being made in the Victoria Fountain, erected in Victoria Park, Hackney, at the expense of the Baroness Burdett-Coutts, we observe now that, under the directions of the Metropolitan Board of Works, the whole surface of the Aubigny stone facing above the arches, including the elaborate carving, has been scraped and rubbed, so as to remove the natural protective skin caused by the drying-out of the quarry sap, and to expose the stone to the weather in a way which must hasten its decay. Shall we not soon require a Society for the Preservation of Modern Buildings?

POORE'S "Manual of Railways for 1888," recently published, shows that in the twenty-two years from 1865 to 1887 the average rates of freight in America were reduced to about one-quarter of what they were in the former year, the decrease being a steady one throughout. Dividing the system into two groups, we find that in the Eastern group the rate per ton per mile was reduced from 2.900 cents to 0.718 cents (touching as low as 0.636 cents in 1885); while on the Western lines the rates fell from 3.642 cents to 1.014 cents. It is still more interesting to notice that there has been a concurrent steady increase in the aggregate freight carried, and that the heavier tonnage more than compensated for the reduction in rates. There are no data for determining how far the reduction in freight has affected the net earnings per ton per mile further back than 1884, but they have not fallen during the last three years, in spite of a reduction in rates of about 3 per cent. on the Eastern and 17 per cent. on the Western lines. Of course, while this proves that traffic is stimulated by cheaper rates, it must be allowed that circumstances hardly warrant our looking for equally favourable results from reduced rates in England,—our traffic being carried under very dissimilar conditions. The American railways have a great advantage in receiving so much of their traffic in train-loads, which swells the average load per truck. Our average truck-load of about two tons is laughed at, but large consignments are comparatively few and far between. Mr. Jefferds, C.E., writing to a contemporary, asserts that our tonnage would be more than quadrupled by reducing freights one-half, as a profitable market could be found for many articles which can be produced in England, which are now shut out from the markets of the world owing to high transport rates. He quotes statistics from the returns of the Chicago and North-Western Railroad, which has reduced its freights from 1.42 cents in 1882 to 0.99 in 1888, and whose last dividend was 6 per cent. Mr. Jefferds appears to have a firm conviction that the salvation of our lines depends upon the adoption of the bogie-truck cars, and we learn from the communication alluded to that Sir James Ramsden has imported some trucks of very high carrying capacity,—probably of a similar type to those recently on view at St. Pancras,—for use on the Furness Railway. These trucks are largely made of steel, which, as it has already displaced iron in the construction of rails, seems not unlikely to supersede wood for sleepers. We have before alluded to the great reduction in non-paying weight requiring

to be hauled by the adoption of this system, and have no doubt that the example set by the Midland and Furness Railways will soon be followed, if their experiments prove successful.

LONDON is this week undoubtedly richer by one fine statue; for the bronze figure of General Gordon, in Trafalgar-square, is a fine one, not merely as London statues go, but intrinsically. It is altogether out of scale with the neighbouring figures of Napier and Havelock, and the pose is wanting in the dignity for which one looks in the statue of a national hero; but it is a real work of art nevertheless. Portraiture seems to have been the aim of the sculptor rather than any heroic ideal representation of the man. The figure stands upon the right leg in a natural attitude, the left arm is crossed over the waist, and the hand, holding a Bible, supports the elbow of the right arm. The head is a little bent, the chin resting upon the closed fingers of the right hand. The well-known features are lit up by a slight smile, and the calm eyes gaze at the spectator with an expression it is very easy to fancy is cynical. The proportions and easy attitude of the figure are as expressive of physical power and activity as the countenance is of contemplation. The military character of the hero is amply shown by the undress uniform of a field officer which he wears complete to the glasses and cane, and by a broken mortar upon which the left foot rests,—a piece of artistic "property" rather unworthy of the sculptor. The pedestal is enriched on the right and left sides by bronze panels in low relief, the work, like the figure, of Mr. Hamo Thornycroft. The panel on the left of the statue, with the figures of Charity and Justice, was exhibited at Burlington House this year, and was commented on by us at that time. The other panel is less interesting on the whole, but the two female figures symbolical of Fortitude and Faith that fill it are beautiful things also. The first, strong and calm, holds a sword in the right hand, and a shield in the left bearing the words "Right fears no might." Faith, with a cross on her breast, raises her eyes and hands, and gazes upwards from under a veil. The pedestal itself is a vast improvement upon the usual thing, but it is rather unhappily proportioned at the base. The two steps, forming a sort of podium, should be much larger, and the great hollow above them is out of scale. The cornice is much better, but it projects too much, and we could have very well dispensed with the rather commonplace wreaths of bay that surmount it. The front panel of the pedestal bears the simple inscription: "Charles G. Gordon, C.B., Major-Gen. Royal Engineers, killed at Khartoum XXVI. January, MDCCCLXXXV." It is surely a great mistake to have put this fine work just behind the Nelson Column.

THE Canongate old cross, Edinburgh, which has for a lengthened period been fixed against the wall of the Tolbooth, is to be placed on a pedestal in the recess opposite the Parish Church. The pedestal upon which stood the Edinburgh "Market Cross," prior to its restoration, is to be utilised for the purpose.

WE have made some remarks which have been rather resented in some quarters, as to the issue of a circular of "General Advice" on Restoration in the name of the Institute, and which we said was obviously not in a true sense the opinion of the Institute, but only that of a small number of architects holding special views on church restoration. We print in another column a letter from Mr. Lacy Ridge, whom every one will admit to be an energetic and able member of the Institute, which entirely confirms what we said, that the document put forth as the opinion of the Institute on Restoration has no proper claim to that title, and does not really represent the opinion of the Institute as a body. Mr. Ridge comments strongly on this way of doing things, and not without reason. If it was considered inconvenient

\* (B. Haussoullier's "Athènes et ses Environs. Collection des Guides-Johanne." Grèce I. Paris, 1888, Hachette, xxxiii., 216, 8, 4, Karten. 10, Plans. 12 fr.)



to submit the question to a general meeting, at all events it would have been easy to describe the document as what it really is, the opinion of the Art Committee of the Institute; then the true authority attaching to the document would have been known, and no one could have complained of being misrepresented.

#### HYDE PARK CORNER.

MISS EMILY J. WOOD has presented to the National Gallery two highly-interesting paintings of Hyde Park Corner. They serve as a record of some of the manifold and generally forgotten changes that have passed over that quarter within the last hundred years. The earlier one is labelled "Unknown—eighteenth century (?)"; the other, "By James Holland—b. 1800, d. 1870." Both are drawn from the same spot, a few yards west of the crossing to Grosvenor-place, looking down the incline of Piccadilly. In the former we see the turnpike, with its two lodges and central array of eleven lamps, portions of the two park walls, old Apsley House, and, in the foreground, the eastern wing of St. George's Hospital. The latter two buildings are of red brick, as also are the Park walls. The turnpike was transferred hither from the southern end of Clarges-street in 1761. It then consisted of a toll-house on the southern side of the road, three swing-gates, and two turnstiles on the footpaths. About thirty years later the toll-house was replaced with two lodges, as designed by H. Holland, placed in the roadway, two side-gates, and railings instead of the turnstiles. This is the turnpike which we see in the picture. In 1825 was passed an Act for the abolition of certain toll-charges. On Tuesday, October 4, of that same year, were sold by auction the Hyde Park Gate with its "engine-house" and weighing-machine, in twenty lots; the toll-house and lamp-posts, in seven lots, by Loudoun's old Chelsea Bun House, which, together with its "museum of rarities," in rivalry to Don Saltero's, met a like fate on April 13, 1839; and, in seven lots, the weighing-machine and toll-house by the wooden bridge across the Grosvenor Canal at Jenny's Whim Tavern and Tea Gardens. The bridge was opened Temp. George I., by the end of Buckingham Palace (*olim* Chelsea) road. A woodcut of the sale, by Abbott, at Hyde Park, will be found in Hone's "Everyday Book," vol. i., cols. 1,357-8. It seems that the Hyde Park Gate was succeeded by a turnpike at Albert Gate, Knightsbridge, which was there as late as 1856, *testis* a water-colour view, of that year, by T. H. Shepherd.

St. George's Hospital was opened for patients on January 1, 1734. In a statement of the Governors' proceedings from their first meeting, on October 19, 1733, to December 29, 1742, we read:—"This Undertaking was set on Foot soon after Michaelmas, 1733, by some Gentlemen who were before concerned in a Charity of the like kind, in the lower part of Westminster," &c. Having taken a lease of what Pennant terms Lord Lanesborough's "country house," whose main front faced northwards towards Hyde Park, they added thereto an eastern and a western wing, after I. Ware's design, as shown in his own contemporary print. Wilson's view (1746) of the old building is preserved at the Foundling Hospital; in the "Crowle" Pennant, Museum Print Room, is a copy of Dagut's print, published by R. Ackermann, on August 1, 1797. In this print should be noticed Colliers big Southampton coach, on eight wheels. The hospital assumed its later aspect mainly at the hands of W. Wilkins, R.A., in 1828-30. The new southern block overlooks the sites of the old Lock Hospital and of Tattersall's yard, together with the "Turf" tavern, at end of the yard. The two pictures under review represent these two stages of the hospital's structural history. Richard Tattersall, stud-groom to the Duke of Kingston, began business here *circa* 1775. In 1865, "Tattersall's," together with the fox and other relics, migrated to Knightsbridge-green.

We will now say a few words about the mansion which Arthur, Duke of Wellington, occupied for more than thirty years, and would never, either verbally or in his correspondence, designate as Apsley House. Writing of Piccadilly, Pennant says (1795):—"The north side only consists of houses, most of them mean buildings; but it finishes handsomely with the magnificent new house of Lord Bathurst, at Hyde-park corner." The mean buildings were for the most part survivals of the various inns

and statutory, or figure, yards that had formerly ranged along this side of the then Portugal-street. One of the inns, or posting-houses, was the "Hercules' Pillars," commemorated by Fielding and Wycherley. Two others have given names to Half Moon and White Horse streets. Separated from the "Hercules' Pillars" by a block of three small tenements stood, next to the Park gate, the apple-stall of James Allen, the Dettingen veteran, upon whom, in 1750, George II. bestowed the fee-simple of his lodging. By letters patent of May 3, 1784, the king gave a grant of the ground here to Henry, second Earl Bathurst, who, on appointment as Lord Chancellor, had been elevated (January 23, 1771), Baron Apsley of Apsley, Sussex. Thereupon Lord Bathurst set about the building of a town house, for which he ultimately employed the brothers Adam. It is said that, having omitted to clear his title to the land on which he began with the stables, he had to compound with Allen's representatives for a payment of 400*l.* (or 450*l.*) a year; and, moreover, that—a warning to lawyers who meddle with architecture he made no provision, in his own designs, for a staircase. Lord Bathurst died here in 1794. In 1810, his son and successor sold the house to Richard, 3rd Earl of Mornington, who had been created Marquis of Wellesley for his eminent services as Governor-General in India, where he defeated Tippono and overthrew the empire of Mysore. In 1820 the Marquis made over the house, by sale, to his younger brother Arthur, who, on May 3, 1814, was created Marquis of Douro and Duke of Wellington, having within six years been raised to every rank in succession of our peerage. Eight years later the Duke employed Messrs. S. & B. Wyatt in altering the house by the additions of the tetra-stylis portico, the "Waterloo" gallery, and other apartments along the western side, the conversion of the attic story, &c., and the casing of the whole with Bath stone. These changes and purchase involved him in a total expense of 130,000*l.* On 15th June, 1830, the Duke paid 9,530*l.* for the Crown's interest in the house; "the Crown," says Cunningham, "reserving a right to forbid the erection of any other house or houses on the site." The historic iron shutters were fixed to the windows after an attack by a mob of "Reform" rioters in 1831. Removed by his successor they were kept there by the Duke "as a monument of the gullibility of a mob . . . if any one be disposed to grow giddy with popular applause, I think that a climb up towards those iron shutters will soon sober him." We may recall, too, how in his last delirium Scott repeated the "Burk Sir Walter!" with which he was assailed at Jedburgh.

The iron bullet-proof shutters do not appear in Holland's painting. So, since he shows Wilkins' hospital and Decimus Burton's Ionic screen and triumphal arch, it is clear that this view was taken during the interval 1828-1830. As here depicted, a trophy of arms surmounts the middle gateway of the colonnade; the opposite arch, at Constitution Hill, carries Britannia with six other figures—being ten in all—upon the entablature, and a quadriga, the horses to the north, upon the pedestal. M. C. Wyatt's colossal equestrian group was drawn hither with a military escort on September 30, 1846, from his foundry and studio at Dudley Grove House, Faddington.\* In an article upon the contents of Apsley House, its collection of paintings, statues, and the like, and Colnaghi & Co.'s ten lithographic plates of the interior, the *Quarterly Review* of March, 1853, writes:—"It has not perhaps been generally observed that on fine afternoons the sun casts the shadow of this equestrian figure full upon Apsley House, and the sombre image may be seen gliding spirit-like over the front."† But all this is a tale of the past. Mr. Shaw-Lefevre's presidency at the Office of Works has been marked by some egregious blunders—as, for instance, at the Tower and Westminster Hall—under the sacrosanct name of restoration. To these may be added the transference of the arch from where, though in itself but a poor adaptation of the Porta Aurea at Pola,‡ it ranged well with the buildings around, to its new situation. On February 10,

1883, we published an illustration to show the arrangements for lowering the statue through the arch—an operation that was begun in the morning of Wednesday, January 24, 1883, under Mr. Reade's superintendence, and in the presence of Mr. Shaw-Lefevre and a few favoured guests. The sombre image now glides over Aldershot, where the figure was set up on a pedestal designed by Mr. R. W. Edis, the Government having contributed 6,000*l.* towards the cost of transport.

#### A GERMAN AUTHORITY ON TOWN SANITATION.

SUBJOINED is a translation of a letter, under date the 12th inst., addressed to Mr. Charles Hancock, F.R.S., and Fellow of the Sanitary Institute, by Dr. Karl Mittermaier, Physician and Sanitarian in Heidelberg, relative to the paper published by the *Builder* in its issue of the 6th inst.:—"I have the honour," writes Dr. Mittermaier, "to reply to your questions in the following way. First, as regards Prof. Alexander Müller, he is recognised as an eminent specialist in Germany in matters of town sanitation; and only those can doubt his competency and the paramount importance of his judgment who would rather have their own preconceived notions confirmed than seek to arrive at the truth. If Professor Müller looks upon the success achieved by the Berlin irrigation system in a less favourable light than do those who originated it, it does not seem allowable, in my opinion, to set such a judgment of his aside, critical though it may be. According to my experience and observation, of many years' standing, concerning the various and most opposite methods of sewage-disposal, I, too, have arrived at the opinion that there is room for doubt as to the efficacy, for inland towns, of the English system of flushing sewers, and that it is better to keep all human excreta, so far as practicable, out of the sewers. Neither the chemical treatment of liquid sewage, nor irrigation or filtration through land, appears to me to be sufficient for sanitary and agricultural purposes. We have, therefore, made the experiment, for years, here in Heidelberg, of introducing an improved pail-system, and we believe we are thus on the right track. The sanitary and financial results of it are favourable in every way.

Heidelberg, it is true, is a small town; but the experience made with the pail-system—even in large towns, such as Graz (Austria), Augsburg (Bavaria), Grlitz (Prussia), Groningen (Holland), and other towns—is equally satisfactory. In Manchester, too, the pail-system is in use on a large scale, as I myself know from having personally visited the spot on various occasions; and in a sanitary sense it has had an excellent result there. I enclose a report on the Heidelberg system, entitled "Die Reinigung der Stadt Heidelberg vermittelst tragbarer und fahrbarer Tonnen," a report which was submitted by our town's Sanitary Council to the International Health Congress at Vienna last year."

We cannot but observe, however, that Dr. Mittermaier says nothing whatever, in this communication, about the manner in which the contents of the pails are ultimately disposed of, which may be said to be the most important part of the problem.

#### The Gordon Statue, Trafalgar Square.

On Tuesday last the Gordon Monument in Trafalgar-square was unveiled by Mr. Plunket, First Commissioner of Works, without formality of any kind. The cost of the monument was voted by Parliament soon after Gordon's death, and the commission to execute it was given to Mr. Hamo Thornycroft, R.A. The monument is altogether 30 ft. high, and the statue itself is 10 ft. 6 in. high. The latter is of bronze; the pedestal is wrought in hard Derbyshire limestone, standing upon two granite steps. In designing the pedestal Mr. Thornycroft is stated to have had the assistance of Mr. Alfred Waterhouse, R.A. The panels represent Fortitude and Faith, Charity and Justice. Some remarks on the work will be found in another column.

**A Relic of Old London.**—Mr. A. Oliver informs us that the carved red lion which was to be seen a few years ago at the corner of an old timber house in Holywell-street, Strand (the house has been demolished), has been placed in the Guildhall Museum.

\* All, except the copper plume, is of gun-metal, varying from 3 in. to 24 in. in thickness. The horse's legs are solid. The Duke's head and body, and the lion's tail, are of copper. The Duke's body and the lion's tail are rivetted on; the other pieces were forged together. The bat is 4 ft. long by nearly 2 ft. high. In the plume (which, by the way, the Duke did not wear at Waterloo) was found a bird's nest. Copenhagen died in 1836.

† By a singular coincidence, in another article of the same volume is cited Napoleon's exhortation to the Grand Army in Spain to plant its standards on the Pillars of Hercules.

‡ *Vide Builder*, September 25, 1866.





#### A GLOUCESTERSHIRE LODGE.

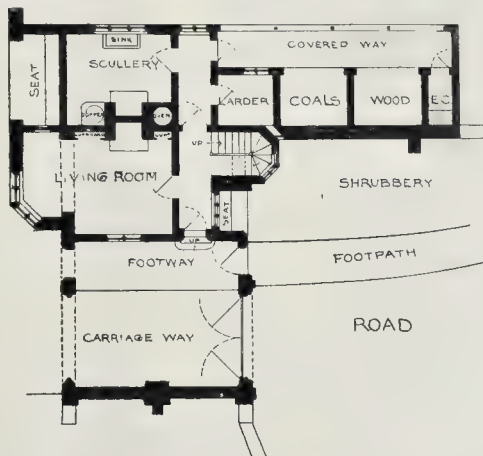
This lodge was designed for Tortworth Park, Gloucestershire. The materials are old red sandstone in the walling, and Bath stone dressings, with red tile roofs. The architect is Mr. W. D. Caro.

The drawing from which the view is taken was exhibited in the Royal Academy of this year.

#### TENDERS AT SPRING GARDENS:

##### ANOTHER SEWAGE SLUDGE SHIP TO BE BUILT.

At the meeting of the Metropolitan Board of Works on the 12th inst., the Works and General Purposes Committee reported that in compliance with the resolution of the Board at its previous meeting, they had further considered the recommendation, which they then submitted, that the tender of Messrs. Green for the construction of the second sludge vessel should be accepted. On the above date a letter was received from Messrs. Green, stating that there were several clauses in the specification which they did not see their way to accept, and that other objections had been raised by their Engineer of so serious a character that they were compelled to withdraw altogether. A further letter had been received from Messrs. Green, pointing out the clauses in the specification to which they took exception. There were three tenders—that of Messrs. Fleming & Ferguson, amounting to 24,750*l.*, being the next lowest. It was pointed out, however, by the Engineer, that this tender was incomplete, and, under all the circumstances, it appeared to the committee that the proper course would be to accept the remaining tender—namely, that of the Naval Construction and Armaments Company, Limited, amounting to 24,785*l.*, and the committee recommended in accordance with this view.



*A Gloucestershire Lodge. Plan.*

Mr. E. R. Cook moved the adoption of the report, and observed that the committee felt, after the letters from Messrs. Green, and finding the second lowest tender also informal, that there was no other way of dealing with the matter than to accept the tender of the Naval Construction and Armaments Company, which was in perfect order. In addition to this, the sum asked by this company was not much above the other tenders.

Mr. Lenanton said he was unavoidably absent when the matter was discussed at the Works Committee's meeting on the 8th inst. He had been informed that some of the clauses of the specification for the vessel were most unusual, and so stringent that it was impossible for any shipbuilder to carry them out in their entirety. If that were so, then he considered Messrs. Green had come to an honourable conclusion in withdrawing their tender, and if the Board now



placed the work elsewhere it should be seen that the conditions of the specifications were fully carried out. He also thought it should be remembered that while in the Port of London Lloyd's surveyors were always present to see that the specifications were carried out, in the out-ports there was not that constant supervision. The Engineer of the Board had no one to send there, and the consequence was that the Board would be at the mercy of the company. He (Mr. Lenanton) therefore asked the Board to pause before agreeing to the acceptance of the tender as recommended.

Mr. Mark H. Judge moved, as an amendment, that advertisements be issued inviting fresh tenders, and that the Engineer be instructed to incorporate in the specification particulars of the machinery required. This was the most unsatisfactory piece of business that had occurred at the Board since he had been a member. To begin with, the Board called in a naval expert to advise them on the specifications, and when the tenders were obtained under the naval expert's advice, the Board declined to make any further reference to the naval expert under whose advice they had got into the difficulty. The Engineer, after the tenders had been referred to the Works Committee, reported that in two of them the specification had not been properly complied with in every respect, and pointed out that Messrs. Green's tender was for machinery of less power and less satisfactory than that provided by the Naval Construction and Armament Company, and suggested that Messrs. Green should be asked what the difference of cost would be for adding to the power of the engines. The result of that inquiry was not placed before the Board, but he (Mr. Judge) found that it would have increased Messrs. Green's tender by £207, which would still leave their tender upwards of £1,500, lower than that of the Naval Construction and Armament Company.

Mr. J. R. Jolly seconded the amendment.

Mr. Lindsay spoke in favour of the adoption of the report.

Mr. Richardson thought the tenders should, at least, go back to the committee for them to obtain Messrs. Green's reasons for withdrawing their tender. Were the Board prepared to spend £1,000 more than was necessary on the vessel? Even if the tender was a little more, he thought the work should be given to the metropolis, and he contended that it was the duty of the Board to do so, and not to throw away their money in the North of England.

Mr. E. R. Cook said Mr. Barnes, the Naval Engineer, was called in as professional adviser, and drew up the specification in the same way as all Admiralty specifications were drawn up, and without the advice of the Board's Engineer. Messrs. Green did not sign the specification accompanying their tender, and when asked the reason, said it was intentionally left unsigned.

The amendment was negatived by twenty-eight to seven.

Mr. Richardson then moved, and Mr. Lenanton seconded, that the matter be referred back to the Works Committee to invite Messrs. Green before them to give an explanation why they withdrew their tender.

This was negatived by twenty-one to six, and ultimately the committee's report was adopted by twenty-three to six, on a division.

#### ARTISANS' DWELLINGS IN SPITALFIELDS.

At the meeting of the Metropolitan Board of Works on the 12th inst., a deputation from inhabitants of Spitalfields and others interested in that parish and parts adjacent (accompanied by Dr. Billing, Bishop of Bedford) presented a memorial asking the Board to deal with the Bell-lane and Pearl-street Artisans' Dwellings Schemes without delay.

The Bishop of Bedford (late the Rector of Spitalfields) spoke for the deputation, and observed that he had no complaint to make against the Whitechapel Board of Works, which had carried out its duty to the utmost in its power to blot out the existing evils. The local Board had insurmountable difficulties in their way because of the owners of property refusing to do what was necessary. He specially called attention to the density of population of the district. For instance, the density of population of the metropolis was 50 per acre, Whitechapel 176 per acre, Spitalfields 286 per acre, Bell-lane area 600 per acre, and the Pearl-street area 500 per acre. The

Bell-lane site was, in fact, more densely populated even than 600 per acre, because a large area of the ground was occupied by the Jews' Free School and by a great omnibus yard. The Board, on more than one occasion, had visited the Bell-lane area. He (the Bishop) had visited the area with other members of the Whitechapel Board, and done what was possible to remedy the evil, and it was now asked by the memorialists that the Board should, in the Bill now being prepared for presentation to Parliament, include this Bell-lane and Pearl-street areas as localities that should be dealt with without delay. The ground that had been cleared by the Board had already been built over with statutory dwellings for the poor, and were already, for the most part, occupied, and to complete the scheme it was necessary that the Bell-lane area should be dealt with. Any one, he added, who knew that part of the metropolis could not help feeling that the Metropolitan Board of Works had done in that locality, in conjunction with the Whitechapel Board, work which would always redound to its credit. The Metropolitan Board had there made magnificent provision for the labouring classes. Were the members of the Board to visit the Pearl-street area, he was sure that, although they would commend what the Whitechapel Board had done to mitigate the evil, they would say that such a state of affairs should not be allowed to exist in a civilised country.

The memorial was referred to the Works and General Purposes Committee for consideration and report.

#### COMPETITIONS.

*Church of St. Hilda, Milfield, Sunderland.*  
The design submitted by Mr. H. T. Gradon, A.R.I.B.A. (of the firm of Alexander & Gradon, architects, Middlesbrough), in open competition for the new Church of St. Hilda, Milfield, Sunderland, has been selected by the committee out of twenty-three designs submitted in the competition. Mr. Ewan Christian, architect to the Ecclesiastical Commissioners, acted as adjudicator. The church is designed to accommodate over 500 persons, and will cost about £3,000.

*Restoration of Milan Cathedral.*—Readers of the Builder will remember that, of the 129 designs sent in in the spring of last year to the preliminary competition for the restoration of the façade of Milan Cathedral, fifteen were selected, the authors of which were invited to a second competition. Their amended designs, or rather the designs of fourteen of them (one of the original competitors having since died), are now on view at Milan. A correspondent of the *Deutsche Bauzeitung*, who has seen the designs, states that the exhibition made a great impression upon him. All the competitors have evidently endeavoured to do their best, and although some of them have scarcely excelled their previous performance, others have been more successful in their new work. Nearly all the authors have adhered to the original ideas of their designs, confining themselves to elaborating them more or less in their details. After criticising the several designs, the correspondent of the *Bauzeitung* gives it as his opinion that victory will probably incline towards the work of Signor Brentano, of Milan. But he doubts very much whether Signor Brentano's design will be carried out, after all. From another source we hear that the first premium of 40,000 lire has been awarded to Signor Brentano, and that lesser premiums of 5,000 and 3,000 each were given to competitors from other parts of Italy, as well as from France and Austria.

#### THE INSTITUTION OF CIVIL ENGINEERS: SUBJECTS FOR PAPERS, SESSION 1888-89.

The Council of the Institution of Civil Engineers invites original communications on the subjects included in the following List, as well as on any other questions of professional interest. This list is to be taken merely as suggestive, and not in any sense as exhaustive. For approved papers the Council has the power to award premiums, arising out of special funds bequeathed for the purpose, the particulars of which are as under:—

1. The Telford Fund, left "in trust, the interest to be expended in annual premiums, under the direction of the Council." This bequest (with accumulations of dividends) produces £267 annually.

2. The Manby Donation, of the value of about

10*l.* a year, given "to form a fund for an annual premium or premiums for papers read at the meetings."

3. The Miller Fund, bequeathed by the testator "for the purpose of forming a fund for providing premiums or prizes for the Students of the said Institution, upon the principle of the 'Telford Fund.'" This fund (with accumulations of dividends) realises 150*l.* per annum. Out of this fund the Council has established a scholarship, called "The Miller Scholarship of the Institution of Civil Engineers," and is prepared to award one such Scholarship, not exceeding 40*l.* in value, each year, and tenable for three years.

4. The Howard Bequest, directed by the testator to be applied "for the purpose of presenting periodically a prize or medal to the author of a treatise on any of the uses or properties of iron, or to the inventor of some new and valuable process relating thereto, such author or inventor being a Member, Graduate, or Associate of the said Institution." The annual income amounts to nearly 18*l.* It has been arranged to award this prize every five years, commencing from 1877. The next award will therefore be made in 1892.

The Council will not make any award unless a communication of adequate merit is received, but will give more than one premium if there are several deserving memoirs on the same subject. In the adjudication of the premiums, no distinction will be made between essays received from members of the Institution or strangers, whether natives or foreigners, except in the cases of the Miller and the Howard bequests, which are limited by the donors.

#### List.

1. The Utilisation of Unused Sources of Power in Nature—such as the Tides, the Radiant Heat of the Sun, &c.
2. Standard Specifications for the Materials used in the Construction of Engineering Works.
3. The Influence of Sea-Water upon Portland-Cement Mortar and Concrete.
4. The Construction, Ventilation, and Working, of Railway Tunnels of great length.
5. Description of any new or peculiar type of Mountain-Railway for very steep gradients.
6. Recent Improvements in Cable-Tramways.
7. The Value, with respect to the safety and durability of Metallic Bridges, of (a) increase in the weight of the structure, by the choice of other than the lightest design; (b) increase in the dead load, by the adoption of a heavy description of flooring, with or without the addition of concrete or ballast.
8. The Packing and Preservation of Metals, Woods, &c.
9. Recent Examples of Hydraulic-Lift Graving-Docks.
10. Forms and Construction of Masonry Dams for Reservoirs.
11. The Cleaning and Deepening of Drainage- and Irrigation-Canals by mechanical means.
12. On the Sale of Water by Measure.
13. Descriptions of Mining-Machinery of improved design.
14. Gold-quartz Reduction and Amalgamation—description of the various machines, and of their method of working.
15. The Physical Properties of Metals under Test.
16. The Working-Strength of Iron and Steel as affected by (a) the amplitude (b) the frequency; and (c) the time-rate of the stress-strain.
17. The Present Position of the Manufacture of Steel—its defects, and suggestions for its improvement.
18. The effect upon Basic Steel of (a) Chromium; (b) Aluminium.
19. The Properties of Bronzes and other Alloys.
20. Researches on the actual Working-Limits of Stress in Machinery or Structures under known conditions of variation of loading.
21. The Corrosion of Metal Structures, and the best means of preserving them.
22. The Effect of Wind upon Structures, as influenced by (a) their superficial area; (b) the form or position of the exposed surfaces; (c) the shelter of adjacent bodies; and (d) the dynamic action of sudden gusts.
23. On Forging by Hydraulic Pressure, and Casting under the same.
24. The Construction of the Working-Parts of Steam-Engines, in relation to the high pressures and temperatures now becoming general.
25. The practical limit to the Working-Pressure of Steam in Marine Boilers.
26. The various systems of Forced Draught in Boilers, with the economical results obtained.
27. The most recent types of (a) Mail-Steamers; (b) Cargo-Steamers; and (c) War-Ships.
28. On modern experience in Screw Propulsion, comparing the comparative efficiency of propellers of large diameter, and of smaller ones deeply immersed, and of the influence of form.
29. On the Highest Speeds attained and attainable on Railways, having reference to gradients, curves, and the locomotives employed.
30. The Application of the Compound Principle to Locomotives, and to Portable Engines.
31. Mechanical Friction on Common Roads.
32. The Petroleum Engine and its Applications.
33. The Distribution of Power by Compressed Air or by Vacuum, and the Construction of Machines to be worked by Compressed Air or by Vacuum.
34. Hydraulic Rotative Motors for High Pressures.
35. The means of governing and economising high-pressure and high-speed Hydraulic Engines, &c.
36. The Construction and Working of Windmills suitable for raising Water for the supply of Villages and isolated houses.
37. The best Combined System of Warming, Ventilating, and Lighting large buildings.
38. The Transmission of Steam underground in the United States, with the results obtained.



The Plant used in the execution of important  
neering Works.  
Tools used in the building of Iron and Steel Ships,  
n the Construction of Boilers.  
The Construction and Working of Friction-Brake  
anometers.  
Steam-Cultivation by Digging and by Ploughing.  
The Generation of Alternating Currents in Dynamo  
Electric Machines, and their utilisation for Lighting  
Power purposes.  
Electric Meters for recording the Consumption of  
trial Energy.  
The Construction and Maintenance of Secondary  
eries.  
Central-Station Electric Lighting.  
The Application of Electricity to the Working of  
d Tramways and of Railways.  
The Application of Electricity to the Working of  
ea, Pumps, Tools, &c.  
The application of Electricity to Smelting and  
allurgical Operations.  
The Application of Electricity to the Purification of  
er and of Sewage.  
The Purification of Copper, and the Reduction of  
per Oxide by Electrolytic processes.  
Contributions to the Bibliography of special  
ches of Engineering.

Further particulars and conditions may be  
on application to the Secretary of the  
stitution, 25, Great George-street, West-  
ster, S.W.

# PREMIUMS AWARDED, SESSION 1887-88.

The Council of the Institution of Civil Engi-  
ners has awarded the following premiums:—

*Papers Read and Discussed at the Ordinary Meetings.*  
A Telford Medal and a Telford Premium to Robert  
tuffield, Assoc. M.Inst.C.E., for his Papers on  
anganese in its Application to Metallurgy," and  
The Newly-discovered Properties of Iron and Mangan-

A Watt Medal and a Telford Premium to Peter  
ham Williams, M.Inst.C.E., for his Paper on  
he Trials of a Non-condensing Steam-Engine,  
ple, Compound, and Triple."

A Telford Medal and a Telford Premium to Edward  
hinson, M.A., D.Sc., Assoc. M.Inst.C.E., for his Paper  
Electrical Tramways; the Bessemer and Newry Tram-

A Watt Medal and a Telford Premium to Edward  
and Ellington, M.Inst.C.E., for his Communication  
The Distribution of Hydraulic Power in London."

A Telford Medal and a Telford Premium to Josiah  
ree, Jun., M.A., Assoc. M.Inst.C.E., for his Paper on  
he Economic Use of the Plane-Table in Topographical  
urveying."

A George Stephenson Medal and a Telford Premium  
Sir Bradford Leslie, K.C.I.E., M.Inst.C.E., for his  
out of the Erection of the 'Jubilee' Bridge, carrying  
the Indian Railway across the River Hooghly at  
oghy."

The Manby Premium to the late Hamilton Goodall,  
M.Inst.C.E., for his Paper on "The Use and Testing  
Open-heart Steel for Boiler-making."

*Papers Printed in the Proceedings without being  
discussed.*

A Watt Medal and a Telford Premium to Professor  
Auguste Ernest Dwellshauvers Dery, for his Paper  
A New Method of Investigation applied to the Action  
Steam-Engine Governors."

A Telford Premium to William Mann Thompson,  
A.B.E., Assoc. M.Inst.C.E., for his Paper on "Im-  
proved Systems of Chaining for Land and Engineering  
Surveying."

A Telford Premium to James William Wyatt,  
J.R.E., Assoc. M.Inst.C.E., for his Communication on  
Playing Paper with Rostin."

A Telford Premium to Degold Drummond, M.Inst.  
t, for his Paper on "The Heating of Carriages by  
haust Steam on the Caledonian Railway."

*For Papers read at the Supplemental Meetings of  
Students.*

A Miller Prize to David Sing Capper, M.A. Stud.  
nt.C.E., for his Paper on "The Speed-Trials of the  
est addition to 'The Admiral' Class of British War-  
sels."

A Miller Prize to Lawrence Gibbs, Stud.Inst.C.E.,  
his Account of "Pumping-Machinery in the Fenland  
d by the Fenstide."

A Miller Prize to Harold Medway Martin, Wh.Sc.,  
nd Inst.C.E., for his Communication on "Arched Ribs  
d Vousoirs Arches."

A Miller Prize to John Henry Parkin, Stud.Inst.C.E.,  
his Paper on "River-Gauging at the Vyrnwy  
ervoir."

A Miller Prize to Alfred Chatterton, B.Sc., Stud.Inst.  
t, for his Paper on "The Prevention and Extinction of  
res."

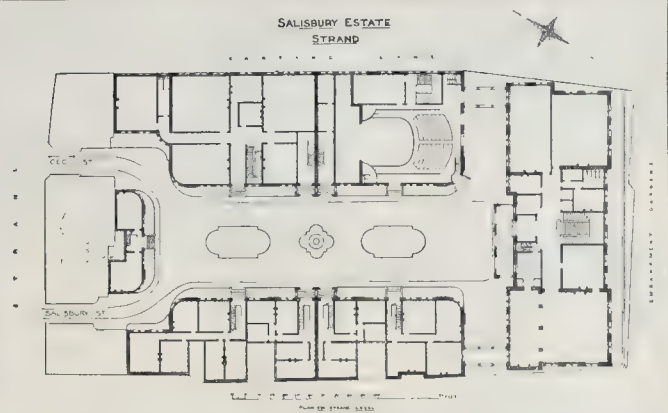
A Miller Prize to John Holliday, Stud.Inst.C.E.,  
his Paper on "Boiler Experiments and Fuel-  
conomy."

A Miller Prize to Arthur Wharton Metcalfe, Stud.  
nt.C.E., for his Paper on "The Classification of Con-  
cious and Unconscious Brakes."

A Miller Prize to Robert Jarratt Money, Stud.Inst.  
t, for his Account of "Railway Engineering in British  
orth America."

**A Silver Pastoral Staff** is to be pre-  
sented to the Bishop of Qu'Appelle, Canada.  
The work has been entrusted to Messrs. Jones  
Willis.

\* Has previously received a Telford Medal and a Telford  
Premium.  
† Has previously received Telford and Watt Medals and  
Med Premium.  
‡ Has previously received a Telford Premium.  
§ Has previously received a Miller Prize.  
|| Has previously received a Miller Prize.  
¶ Since elected an Associate-Member.  
\*\* It has been determined to print the eight Papers,  
ther in whole or in part, in the Minutes of Proceedings.



## Illustrations.

### DESIGN FOR A DRAWING-ROOM AND ORGAN-CHAMBER.

**I**N this design great richness of effect  
has been aimed at, using for the wall-  
panelling and woodwork generally  
rosewood inlaid with pear-tree, and where  
carving occurs it is to be executed in the latter  
wood. The upper part of the wall-panelling is  
intended to have pictures, suitable subject heads,  
somewhat decoratively treated; on the walls  
above an arabesque design is to be painted in  
tones of gold, copper, and bronze; curtains and  
other upholstery to be of amber silk and plush;  
the base of the fireplace of marble with Mosaic  
coverings.

In the niches at the sides will be placed  
statuettes of bronze.

Through the arch on the right of the  
chimney-piece is an apsidal organ-chamber or  
music-room with domical roof, around the lower  
part of which is painted a procession of figures,  
singing and performing on musical instru-  
ments.

The mouldings of the ceilings are of rose-  
wood with carved and gilt ornaments, and  
panels painted in various designs and of tints  
similar to, but lighter than, the wall treatment.

The design is by Mr. W. F. Randall, and the  
drawing from which the illustration is taken  
was hung in the Architectural Room at the last  
Royal Academy Exhibition.

### SALISBURY ESTATE, STRAND.

WE give a view of the buildings proposed to  
be erected on this estate, from the designs of  
Messrs. Perry & Reed, architects. The following  
particulars in regard to it are extracted from an  
account furnished by the architects:—

The property known as the "Salisbury Estate,  
Strand," comprises the houses of Cecil and  
Salisbury-streets, and the low-lying land be-  
tween the ends of them and the gardens of the  
Thames Embankment.

This lower portion has for many years,—in fact  
ever since the formation of the Embankment,  
which cuts it off from the river,—been in a state  
of dilapidation.

For some years past, as the leases of this  
property have been falling in, schemes for  
dealing with it as a whole have occupied the  
attention of the Marquis's advisers; but the  
main difficulty was that the property could only  
be acquired under a lease, and it was not easy to  
raise a sufficient capital to cover so large a site  
on such a tenure, however favourable; but when,  
under the "Settled Estate Acts," the Marquis  
was enabled to part with the freehold, one  
principal obstacle was removed.

There were many rival schemes submitted for  
the laying out of the estate. These schemes  
were of two classes, and their principal features  
were in the first case the formation of a thor-  
oughfare which should connect the roads on  
the Embankment level with the high level of  
the Strand, and in the second the preservation  
intact of the present private character of the  
property. The Metropolitan Board of Works  
favoured the former idea, and proposed a street  
partly on arches passing round the front of the  
Adelphi, and by gradual curves into the Strand.  
But the objection to this scheme is twofold.

The gradients in any case must have been ex-  
tremely heavy, as the proposed street would  
deliver itself at the highest point of the Strand,  
and, should the street have become much used,  
the through traffic would be scarcely likely to  
prove of any benefit to the estate.

The idea of retaining the privacy of the prop-  
erty found most favour. Several schemes were  
worked out for this, some retaining the site of  
the present streets, and merely rebuilding the  
houses; but the one prepared by the authors of  
the design we publish to-day was the one which  
formed the basis of negotiations which took  
place some years ago, when a lease was being  
applied for, and it has since been adopted by  
the purchasers of the estate, and provides for  
dealing with the site as a cleared one.

In dealing with the site, the architects have  
taken advantage of the almost unique position  
of the property relative to the different levels,  
and have adopted the general idea of the  
"Adelphi" and its substructures as the prin-  
cipal feature of their scheme.

But over the Adelphi the estate has this great  
advantage, caused by the construction of the  
Embankment, in that the Adelphi was kept  
back from the old river-line by the wharfe  
before it, which had to be preserved; the  
destruction of the wharves and river-front  
before the Salisbury Estate enables the buildings  
on the latter to be advanced to the utmost ex-  
tent of the property. It is, therefore, proposed  
to construct, first, a plateau (level with the  
Strand) over the whole area of the site, having  
beneath it, and forming the substructures of  
the buildings to be erected over, a storey about  
35 ft. high, entered from the Board of Works  
road on a level with the Embankment, and  
absolutely distinct from the Strand level. The  
plateau over this is proposed to be laid out as a  
square, entered from the present Cecil and Salis-  
bury-streets, and surrounded by the several  
buildings to be erected. It is intended this  
shall be altogether private, and closed by gates  
at the entrances from the Strand.

As the freeholders are open to negotiations  
for letting off portions of the estate, nothing  
has yet been definitely decided as to the details  
of the several buildings, beyond the general  
arrangement as described above; but the  
following may be taken to be their intention,  
subject to such modifications as circumstances  
may call for. At the southern end it is pro-  
posed to erect a hotel. There would be  
entrances on both the Embankment and Strand  
levels, and also on the lower level would be  
restaurant accommodation specially for the  
theatres so thickly set hereabouts. Imme-  
diately adjoining the hotel it is proposed to  
erect a theatre, drawings for which are now  
before the Board of Works. Of this and of  
the buildings generally we may, at some future  
time, give more detailed descriptions.

From the above it will be seen that the  
"Salisbury Estate" is one of the most important  
building enterprises at present in hand in  
London. It will remove a long-standing eye-  
sore of dilapidation and ruin from the Embank-  
ment gardens, and nearly complete the crescent  
of palatial buildings now encircling the Victoria  
Embankment of the Thames.

The purchasers of the freehold are Messrs.  
J. W. Hobbs & Co., Limited; the architects  
acting for them in the matter are Messrs.  
Perry & Reed.



## OLD COTTAGE ARCHITECTURE.—VII.

THE greater number of the barge-boards in the Surrey district are moulded. Of others, there are two varieties,—those in which the board is pierced with tracery, and those which are cut into cusps.

I know of none of this latter sort, except of a rude nature, as shown on several sketches, and as D in the accompanying cut (fig. 1). In Kent,

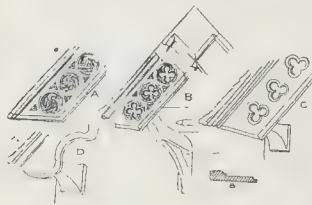


Fig. 1.

and the western part of Surrey, are to be found fine examples of the traceried cusp, but none of the houses in this district seem old enough.

Of the examples of tracery given, A (fig. 1) is from Paddington Manor, and B from Shamley-green and Plunks Farm, at which latter it is carefully plastered up, and only shows in one small place. C and D are from Shiere village. The manner in which the junction of boards at top is covered in B is worth notice as very practical; A is similarly finished.

The houses having these barge-boards are certainly of earlier date than the majority of those illustrated.

As Shiere and a large district became the property of Sir Reginald Bray, the Minister of Henry VII., who was a famous builder, and as the family settled here, it is probable that a good many of these houses were erected by him or his immediate successor.

The barge-boards illustrated in fig. 2 are from a house in the High-street, Godalming,

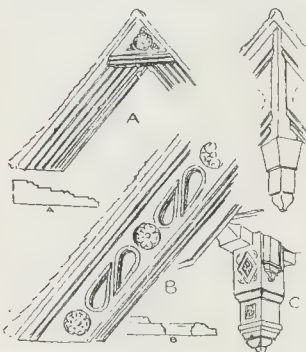


Fig. 2.

and are of a later date, as may be seen from the mouldings. A is that of the dormer, and in this case the joint at top is covered by a piece of the board fixed cross-ways. In the board of a corresponding gable the Tudor roses of B are replaced by a plain chamfered circle. The barge-board on the front at Nursecombe, now replaced by a clumsy imitation, was of similar pattern to this; and so is the pendant on the opposite side. Old pendants to the wall-plate of this front board at Nursecombe, however, remain as shown at C,—an unusual detail.

If we consider the immense amount of building that suddenly went on in the sixteenth century, and the consequent demand there must have been for skilled workmen, it is not difficult to understand why traceried barge-boards went out of fashion, and moulded came in. The one required powers of design and skill of hand, and plenty of time to execute; the other could be carried out in half the time by almost any workman provided with the necessary tools. It would have been physically impossible to erect in the time in the Gothic or earlier Tudor style the number of buildings that were afterwards carried out; and this is, I take it, one reason why the change of style was so rapidly adopted. Building was very much expedited when square-

headed windows, and mouldings instead of carving and tracery, were adopted. At a later period, when the supply partly overtook the demand, we again get plenty of carving; but it is even then remarkable for its absence from the humbler buildings.

Another instance of the change is shown in the joist-boards, or those boards or beams which covered the ends of projecting joists. At the earlier dates, the ends of the joists were generally allowed to show, as at Paddington and Wonerish, and it was probably when timber went up, as it did very much, in value, that the joists became smaller, and it was thought better to conceal the ends.

In the earlier examples,—as A (fig. 3) from



Fig. 3.

Plunks and B from Shiere,—these joists-boards are moulded on no rule, but apparently according to special design; since, although mouldings something similar in design may be found of this date, the variation is infinite. With the introduction of the Renaissance mouldings, either special planes were largely circulated, or at any rate the designs, since, although the collection of members varies, the patterns remain very much the same. C is from Nursecombe, D from the inn at Wonerish, E from Tangle, and F from Hawlands, illustrated in this number.

The subjects illustrated this week are chiefly from Haslemere. In the town are a great many excellent chimney-stacks, generally very high. One of the most frequent plans was not among those given in my last number, and I therefore now give two varieties of it (see fig. 4).

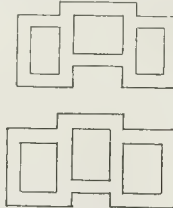


Fig. 4.

Judging from the appearance, I imagine the bricks of these chimneys are not more than 2 in. thick. I gave the size of some in my last chapter, but there are many in the neighbourhood of smaller thickness than I then named. Some at Godalming are only 2 in., and six courses measure 15 in. In the fine chimneys at Abbot's Hospital, Guildford, thirty-six courses measure 8 ft., which gives 2 1/4 in. to a course.

While, as in the earlier work, brickwork was chiefly confined to the chimneys, the trouble of calculating the courses did not make itself much felt, and it was probably only when the whole houses were built of brick that the sizes were increased.

In Haslemere are a very great variety of patterns of weather-tiles. As a rule throughout this district only the pattern B (fig. 5) is much employed.

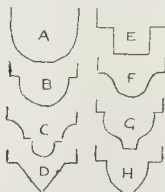


Fig. 5.

About Wonerish and Shiere, and elsewhere, are examples of A, and I have fancied that they had the appearance of being earlier in date than others. Patterns E, F, G, and H all come from Haslemere. C and D are, I think, only of modern date.

I have already said that most of the weather-tiling is of comparatively recent date, but it is

possible that some of this Haslemere work may be earlier. It is, of course, well-known that there were "wall-tiles" even in the sixteenth century.

Of the sketches shown, that at Shutter Mill shows an arrangement similar, on a smaller scale, to that at Bake House, shown in my first chapter. The head of the small gable is, as there, filled in with herring-bone brickwork; in this case there is basket-pattern at the top. Or the house at East-street is a dainty cornice of 2 1/2 in. bricks that certainly postulates weather-tiling above, and that may be as old as 1700.

Lythe-hill Farm has undergone thorough restoration, and it is impossible to tell how much is old or of old pattern. I therefore give it under reserve. I am assured by the occupant that it is all old, and it may very well be so. There is, however, one filling-in of a lower panel with diagonal timbers that is quite unlike the rest of the ground-floor, or anything in the South of England, and this must, I think, be an introduction. There is a panelled room here, with a later Georgian mantelpiece of excellent carving.

It is evident that the projecting part is a wing that has been added to an older house, of the usual pattern with recessed centre. I have had to omit several trees that prevent one's getting a complete view, and make sketching difficult.

Hawlands is a very interesting old house in an out-of-the-way place. The double projection of the upper storey is a sign of early date. This projection is carried at the corners by projecting large beams crossing the rooms diagonally, the joists being framed into them. This is constructional, but the effect inside is extremely unpleasant.

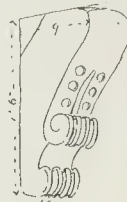


Fig. 6.

A correspondent, in a number of some weeks ago, asked for a plan of something between the small cottages and Bake House. The difficulty is always to find a place that is unaltered; this plan seems to be in its original state, with the stairs in their normal position, and I will give as cut of it in a future number.

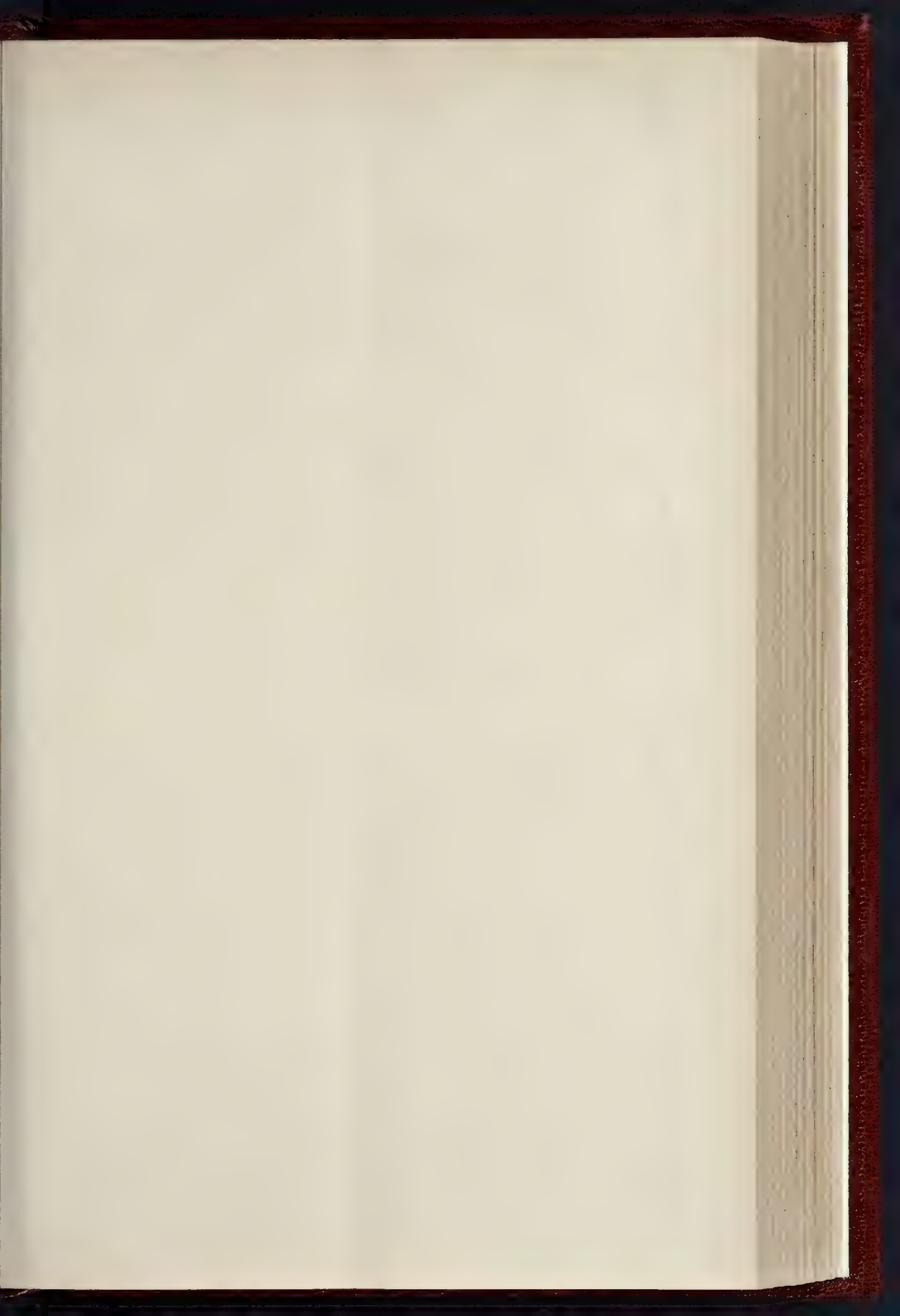
The house at Milford is of a very straightforward type, with the large roof over the hall in the centre, and the parlours in one gabled wing and the offices in the other, with smaller gable. The hall in these cases is, however, now built with a storey over it, instead of, as formerly, open to the roof. This house is covered,—not with nice, comfortable rough-cast,—but smooth cement, that does not do it justice, and is almost obscured from view by two very large yews, which probably began life as humble peacocks, but have been allowed to grow to such an extent as to overshadow the house completely. It is always a hard struggle to sacrifice a fine tree, but at least one of these might be spared with advantage to the look, and certainly to the healthfulness, of the house.

## THE "ABBEY HOUSE," SHERBORNE.

THE "Abbey House" is the residence of Mr. Charles S. Whitehead, one of the assistant-masters of the King's School, and he receives in it a certain number of the boys as boarders; for their accommodation his predecessor erected a dormitory-block, of but little architectural character, in connexion with the house, which has no architectural pretensions whatever.

The title of the "Abbey House" is derived from the ground on which it stands having been within the precincts of the monastery, and there adjoins it on the north a portion of the great Abbey Barn, consisting of its transepts only, converted with new fronts into a dwelling-house in the sixteenth century. Towards the south, with some low premises and gardens intervening, are the quadrangles of the King's School; the outer one is formed by the school-house dormitories, the studies (the ancient



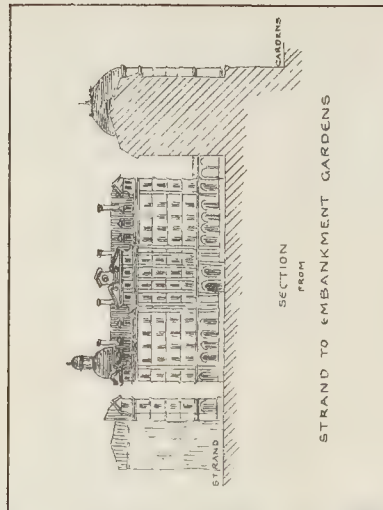
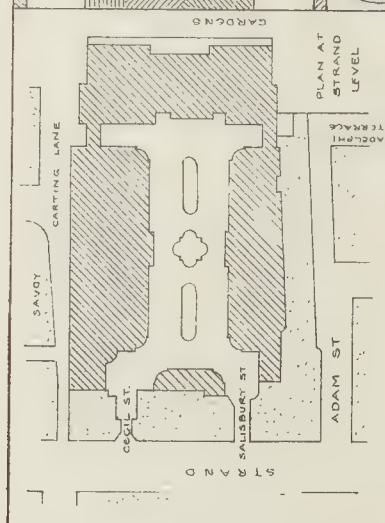


THE BUILDER, OCTOBER 20, 1888.

# SALISBURY ESTATE STRAND RIVER FRONT

PERRY AND REED  
ARCHITECTS

J.W. HOBBS AND CO. LTD.  
CONTRACTORS





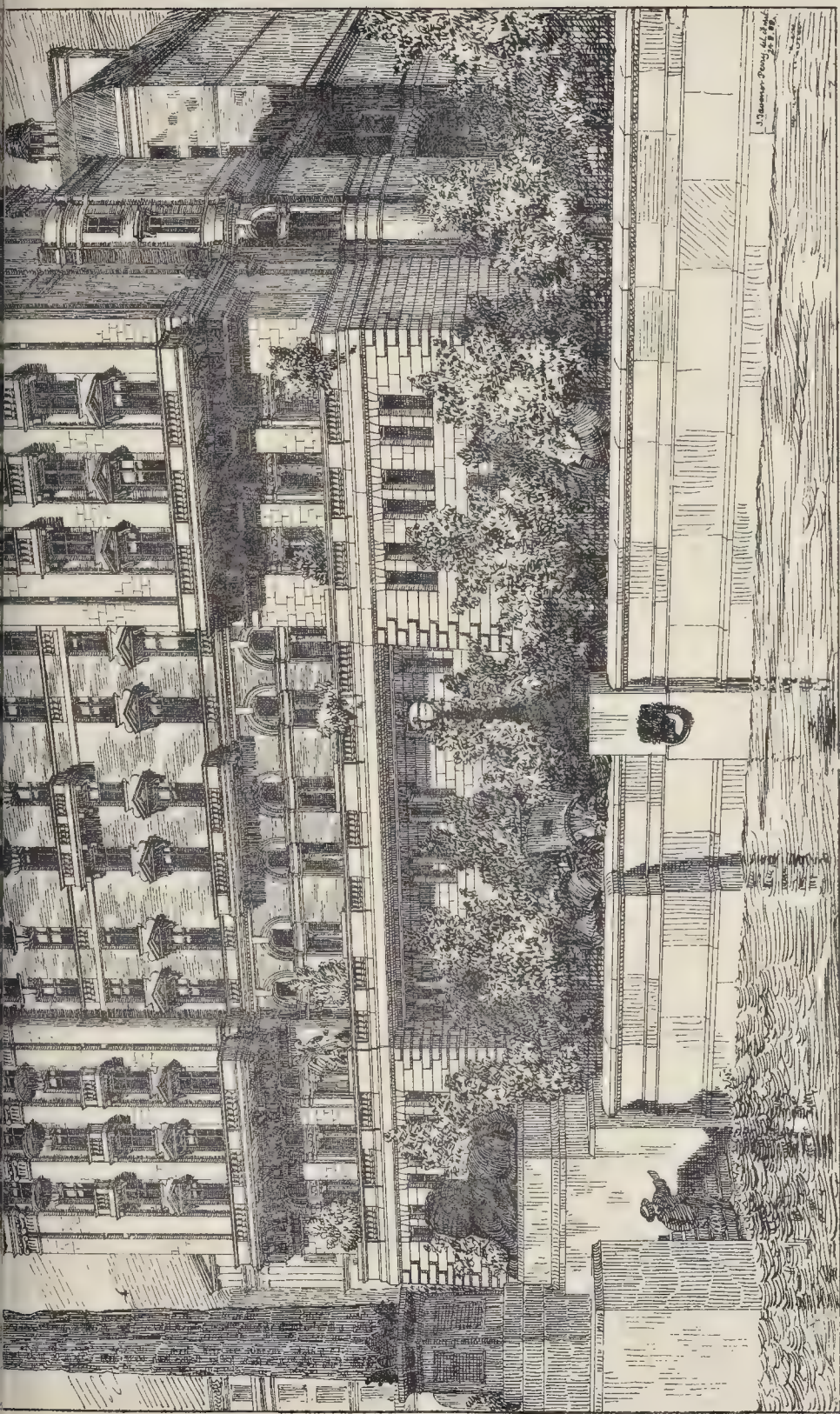
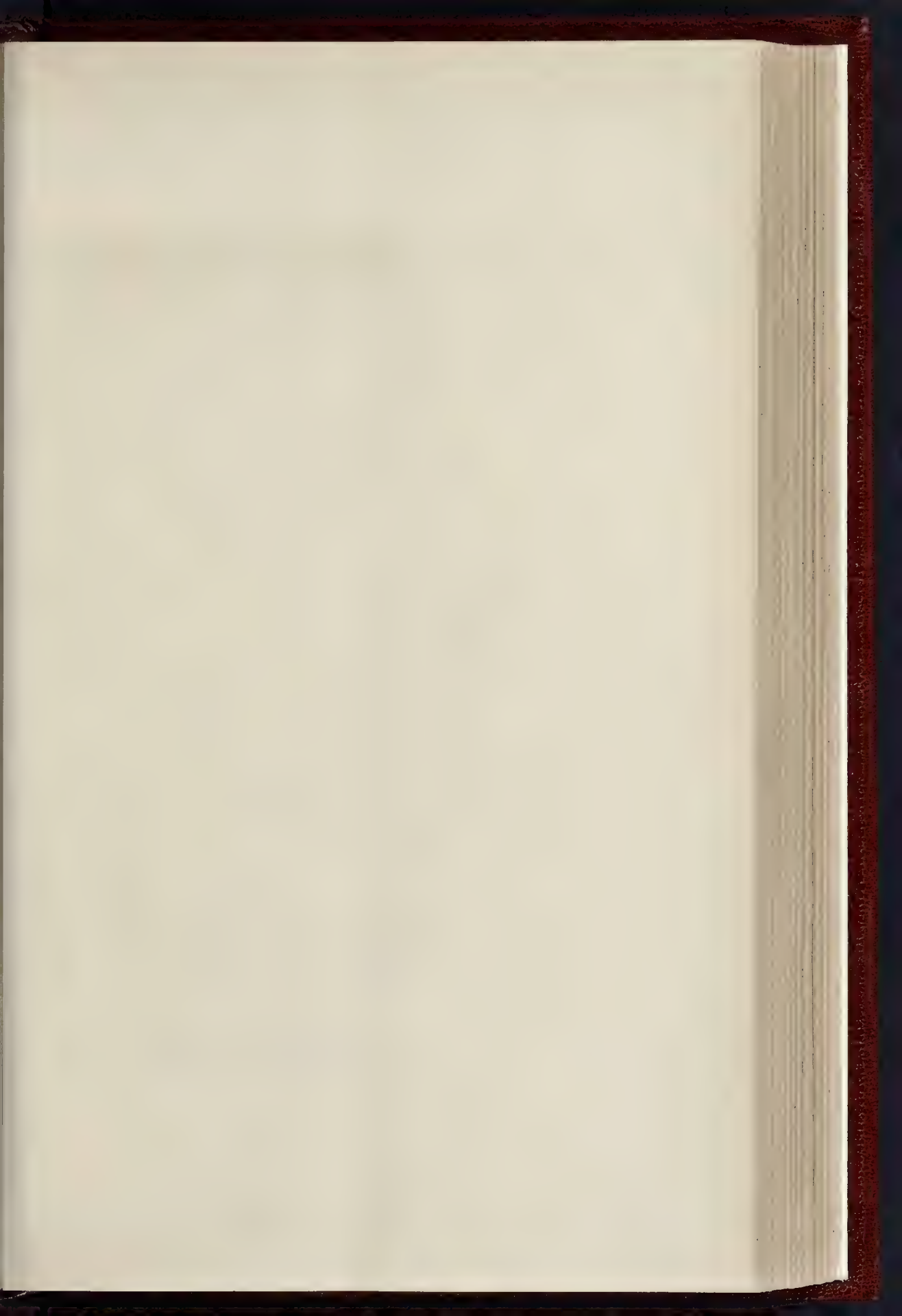


FIG. 2. THE SPRING & ST. MARTIN'S LANE CANON'S OFFICE, LONDON, E.C.



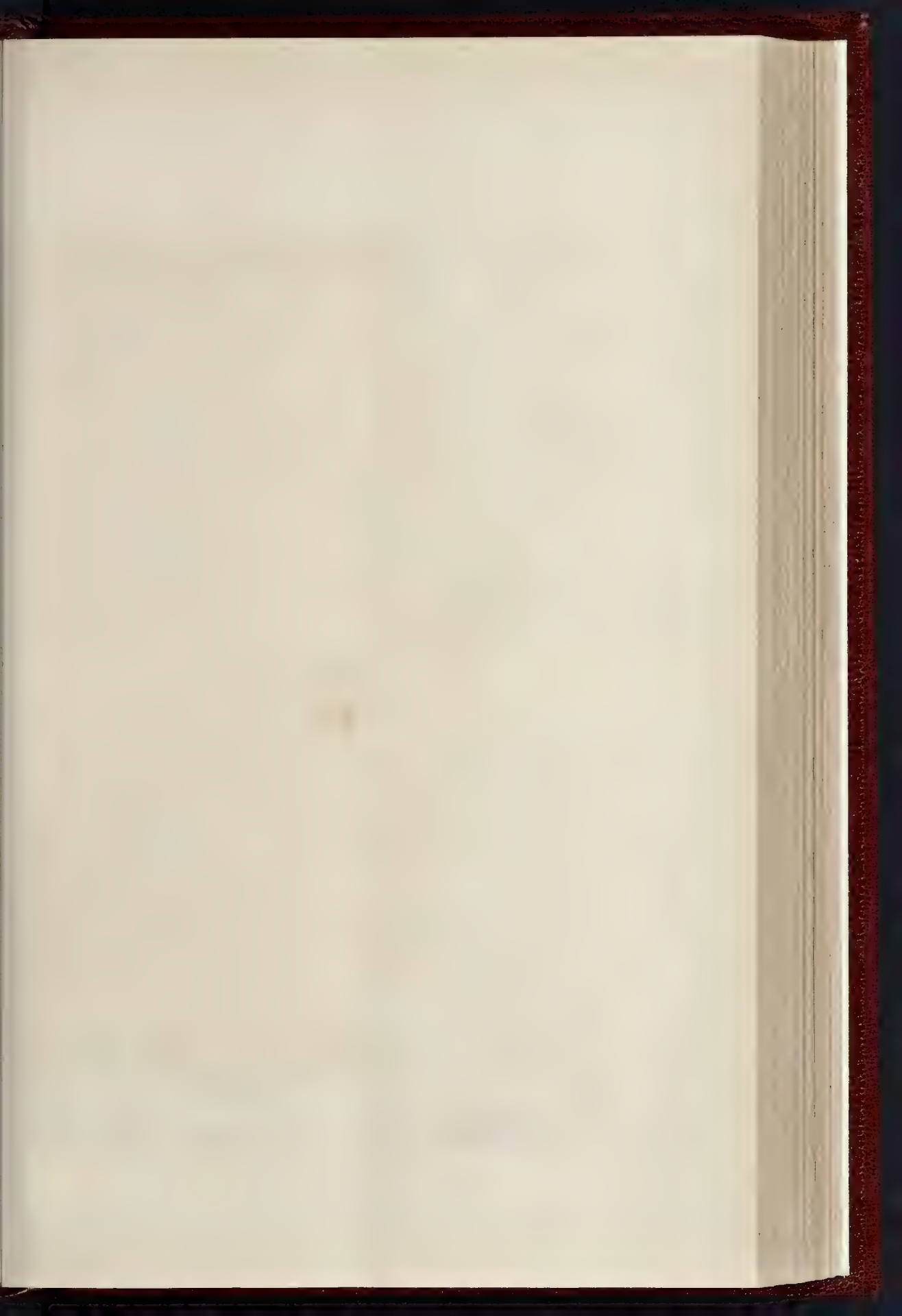




THE BUILDER, OCTOBER 20, 1888.







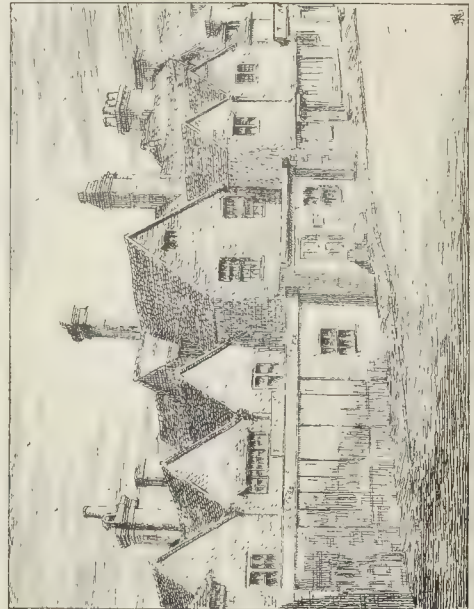
THE BUILDER, OCTOBER 20, 1888.



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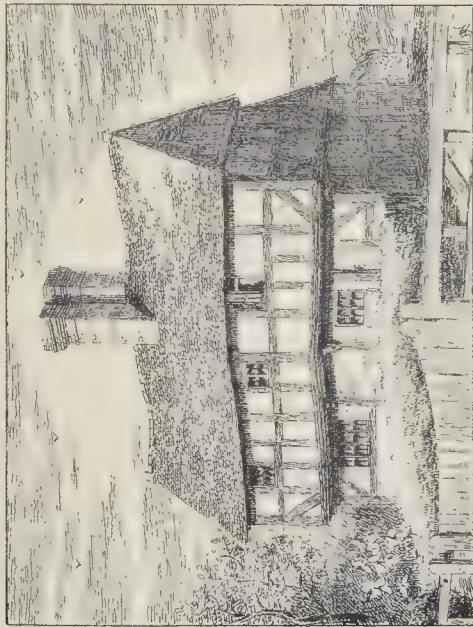




LETHE P. LADIA



AT ANDHIS WILES



HAWKINS HUNGARY



AT MILFORD

PHOTO LITHO SPRINGUE & CO. 22 MARTIN LANE LONDON E.C.

OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.



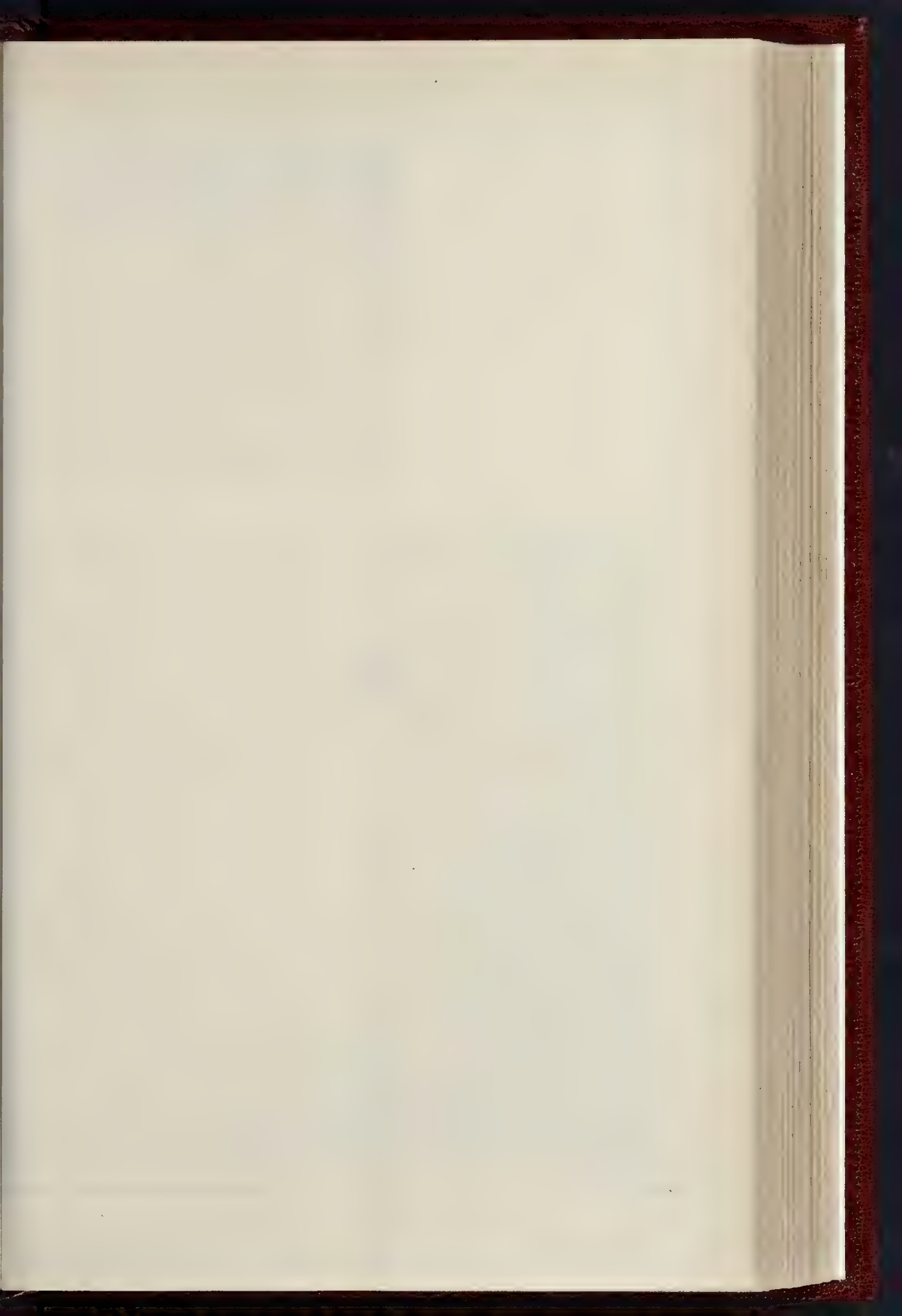


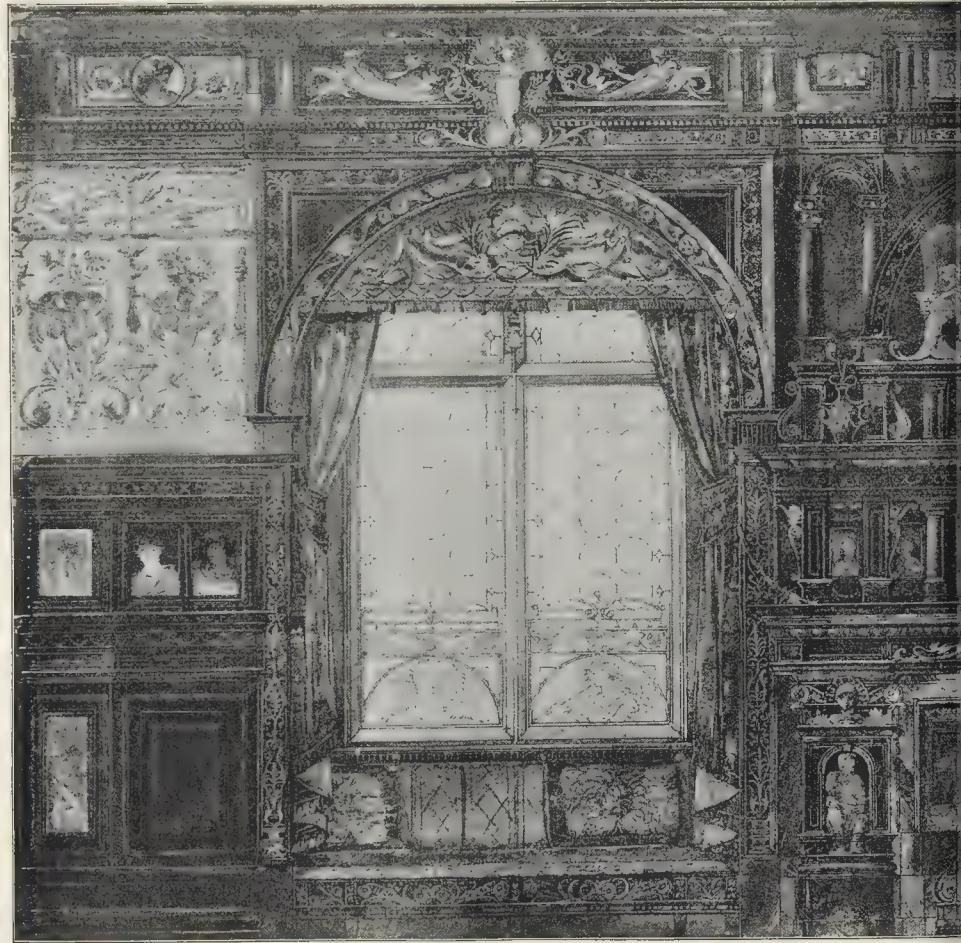


DESIGN FOR NEW FRONT TO THE FREE PUBLIC LIBRARY, CHESTER.—MR. THOMAS M. LOCKWOOD, F.R.I.B.A., ARCHITECT.



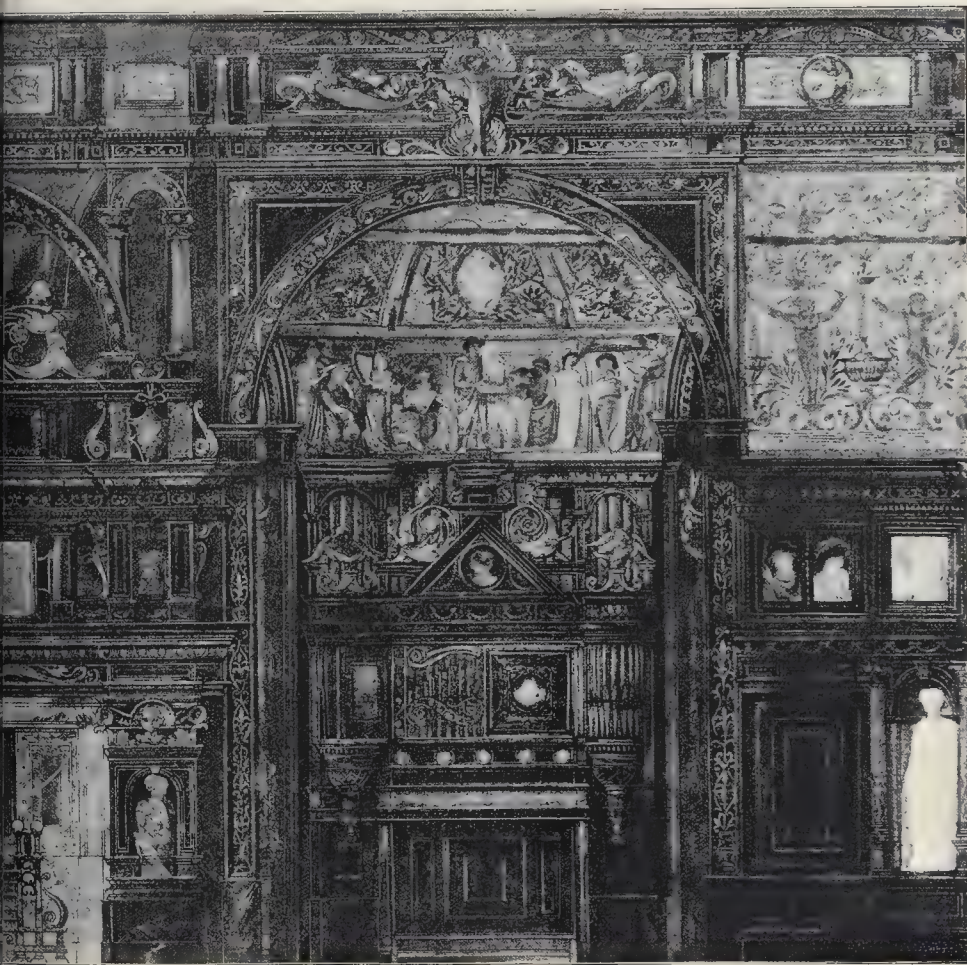






DESIGNS FOR DRAWING ROOM AND





CHAMBER. BY MR. W. F. RANDALL.

The Phototype Co., 303, Strand, London.





ot's House), the chapel (the ancient Abbot's), and the new great school-room and lavatories, all connected by a grained cloister, the inner quadrangle are the head-master's study, the old school-room, and the school hall (the ancient Guesten Hall), while the old Abbey Church fills up the whole of the eastern side.

It was felt, therefore, by the Governors that "Abbey House" should be so added to and altered as to harmonise with the school buildings near it, and the work was put into the hands of the architects of the school by Mr. Steward.

The additions (shown by the lighter tint on plan) include studies for the boys, with lavatories, bath-room, boot-room, &c., a new entrance and staircase to the dormitories, which have been altered, and new dormers and dormers inserted harmonising with the other work. Extensive offices have been added in connexion with the house.

Local stone is used for the walling, with slings of Ham-hill stone, and Broseley tiles the roofs. The contractor is Mr. Betton, of Walsby, under Mr. F. Smith as the clerk of works, who has also superintended other works of the school, and the restoration of the Abbey tower for the architects, Mr. R. Herbert, architect and Mr. Ingelow.

#### PROPOSED NEW FRONT: FREE PUBLIC LIBRARY, CHESTER.

On the 1st inst. the Mayor of Chester (Mr. William Brown) presented the citizens with a new reading-room, which was erected behind an existing building; this room is 51 ft. long by 30 ft. wide, and a one-story building amply lighted from the roof.

It was intended to build a new front to the building, and our illustration (reproduced in a drawing in this year's exhibition of the Royal Academy) shows what was proposed to be carried out in the half-timber style so identified with Chester. It is possible that the front may yet be built as shown in our view, but expensive alterations behind, involving considerable outlay, have caused this front alteration to be left at present in abeyance. The work hitherto carried out has been done by Mr. Thomas Hughes, builder, of Aldford and Chester, from the designs and under the superintendence of Mr. Thomas M. Lockwood, R.I.B.A., of Chester.

#### OBITUARY.

**Lord Mount-Temple.**—We record with much regret the death of Lord Mount-Temple, which occurred on Tuesday morning, at his residence, Roadlands, near Romsey, Hants. He had been in ill-health for some time. The Right Hon. William Francis Cowper-Temple, Baron Mount-Temple, county Sligo, in the peerage of the United Kingdom, was the second son of the 10th Earl Cowper. His lordship was born on December 13, 1811. After serving for some years in the Army, he entered upon a political career, and became secretary to Lord Melbourne, when that nobleman was Prime Minister. After holding some other posts, he was in 1855 appointed President of the Board of Health. In February, 1860, he was appointed First Commissioner of Public Works, which office he retained until the resignation of Earl Russell's Government in 1866. The most important measure introduced by Mr. Cowper as First Commissioner was the Thames Embankment Bill, brought forward in the session of 1862. After much opposition, the measure became law. During Mr. Cowper-Temple's tenure of the First Commissioner's office the parks were also greatly improved. Altogether, he may perhaps be said to have been the most successful First Commissioner of Works who has held the office.

**Mr. John Fowler.**—The death is announced of Mr. John Fowler, M.Inst.C.E., the chief engineer of the Tees Conservancy Commission, which took place on the 11th inst., at his residence, Popeswood House, Preston-on-Tees. According to the *Darlington and Stockton Times*, Mr. Fowler, who had attained his 64th year, was a native of Aberdeen. He came to Tees-side in 1847, when he became assistant to his late friend, Mr. Jas. Johnston, who was at that time Engineer to the Tees Navigation Company. He retained his position for seven years, until the death of Mr. Johnston, and in 1854 he was appointed Engineer to the Tees Conservancy Commission, which was formed two

years previously. This post he has continued to fill up till the time of his death, though latterly the burden of the work in connection with his office has fallen upon Mr. Fred Jobling, his assistant. During the past thirty-four years all the great improvements which have been made in the Tees estuary, transforming it from a shallow stream into a navigable river, have been either conceived by Mr. Fowler or carried out under his supervision. For some time past he has also been Consulting Engineer to the Ouse Navigation Company, and has carried out certain works in connection with the Aire and Calder Navigation Company. He also superintended some improvements in the Ribbles at Preston.

#### ALTERATIONS AT THE BANK OF ENGLAND.

SIR,—I was in the Rotunda of the Bank of England yesterday, and I saw to my sorrow that a wide gallery is far advanced in construction around it under the dome, and apparently utilising the upper portion of the niches. What is the use of having a good work in a city if it is to be damaged in this manner? Shades of Sir Robert Taylor and of Sir John Soane forgive the authorities!

WYATT PAPWORTH.

October 13, 1888.

#### THE "GENERAL ADVICE" ON RESTORATION.

SIR,—Surely nothing can tend more to undermine the influence of the "General Advice" on restoration *aid* to be issued by the Institute than a public discussion as to the individuals who are or who are not responsible for it. Your original remark, Mr. Editor, that it is not issued by the Institute, is perfectly true. The members of that body have never been asked to consider or approve it. It is strange how slow those who manage our affairs are to learn wherein the value of a representative professional society consists.

LACY W. RIDGE.

#### COPENHAGEN TOWN-HALL COMPETITION.

SIR,—In your journal of September 8 [p. 178] it has been announced that the Corporation of Copenhagen invited designs for a new Town-hall in Copenhagen, and several English architects have in consequence applied to our magistrates for particulars. Will you kindly allow me through these lines to inform those gentlemen and your readers in general that only Danish architects have been invited to compete?

J. FENGER,

Architect of the Town.

Copenhagen, Oct. 14, 1888.

#### A RESIDENTIAL COLLEGE FOR ARCHITECTURAL STUDENTS.

SIR,—In Professor Roger Smith's interesting lecture at the opening meeting of Session 1888-9 at University College, London, occur the following words:—"I believe there comes to most young men a time when the novelty of their change of occupation and position has worn off, and the irksomeness of routine is being felt, with possibly the depression due to being in lonely lodgings, instead of a bright home or the sixth-form of a busy school, and the wish to give up rises." These words, Sir, I read and read again, and they took me back to a time, not so very long ago, when I was in lonely lodgings, fresh from the country, without many friends in town, and anxious not to make myself a nuisance to those I had. I was lonely in every sense of the word,—depressed, miserable. I began to hate my books and drawing-board, and used to seek a solace for my loneliness out-of-doors. The Oratory, for instance, used to exercise a great fascination for me. The music was delightful, and it cost nothing—a great recommendation in my eyes, for those were times when my pocket was light and my heart was heavy. Perhaps, though, it was fortunate for me that I had no money. Its want is a powerful restraint when one's evenings were as utterly wretched (yes, that is the word) as mine were.

Times have since changed with me. My pocket is no longer light and my heart no longer heavy; but, Sir, my sympathies go out towards those who are in the same position as I was, and Professor Smith's words have led me to make public the idea which has lately been exercising my brain. The question that occurred to me was, "Why should these things be?" Is there any reason why our architectural students should not combine together and form a sort of residential College, as the medicals have done? Indeed, the great success of these medical Colleges makes me sanguine that an architectural one, judiciously conducted on popular lines, could not but be a success. In a recent number of the *Hospital*, the Dean of Middlesex Hospital Medical School wrote, "Our residential College is a great success, and supplies a much-felt want;" and a striking confirmation of this statement lies in the fact that Guy's is now making arrangements for the erection of a residential College.

I do not propose to go into anything vast at present. We must first gauge our depth and go on step by step cautiously, never making a move till we are quite sure that it is the right one. My idea is to take a house within convenient reach of Conduit-street, Bloomsbury, and the City, for about a dozen men, and to let each have his separate room, with some contrivance similar to that at the Meistersingers' Club, so that the bedroom might be turned into a jolly little sitting-room during the day. Each man would furnish his own room and decorate it to his own taste, as in the Universities. For general rooms there would be a common room, with chess, draughts, the building papers, &c., for conversation, smoking, &c.; a dining-hall, containing a house library of the principal architectural text-books, of which I already have a nucleus; and a drawing-room, for singing, &c. As regards management, I should propose to engage a housekeeper, well known as a good organiser, with one or two under-servants. For meals, each collegian could have his breakfast at his own time, but dinner in hall would be provided for those who desired it, at a fixed tariff, every evening and on Sundays. If the house had grounds attached, and we could get a tennis-court or two marked out, it would be good for summer evenings.

With regard to the important question of discipline, I should imagine that the disapproval of his fellows would prevent most men from behaving in a manner injurious to the welfare of the College, but I should propose that power to deal with minor offences be given to the senior students for the time being, all important questions being referred to a body of trustees, who would have the power to summarily remove any offender from the college. As to entrance, I would say that candidates would be in all cases have to be quite junior students, and would be entitled to remain in the house until they had passed the A.R.I.B.A. examination, when they would have to leave. Of course, the examination would have to be passed within a certain time, as at Oxford. Now for fees: these would naturally depend a great deal upon circumstances; but if the College were economically conducted, I think expenses could be paid for, say, 10s. a week for rooms and attendance, and 1s. a week subscription to form the library, &c., for each student; provisions, &c., being obtained from the Stores, and supplied to the student at cost-price. These fees would have to be paid in advance. There would be no profit, as the whole affair would be in its essence self-supporting; the only item partaking of this nature would be a small sum paid week by week into a reserve fund to prepare for eventualities.

This then, Sir, is a brief outline of the scheme that I have elaborated, and which I quite believe to be practicable. The main question to my mind is whether the time is yet ripe for the development of such a proposal, and I therefore ask all those who would be glad to join in some such College as I have indicated to be kind enough to let me have a letter, addressed to 9, Conduit-street, W., giving me some assurance to that effect; and, Sir, if my proposal does meet with my fellow-students' approval, I will promise them my earnest and active co-operation to make the College a success. Perhaps, some day, some munificent patron of architecture may present us with a magnificent sum for building a permanent College, such as our fellows of the Royal College of Music have recently received. At all events, there will be the opportunity.

Αρχιτέκτων.

London, October 10, 1888.



# GREAT INDIAN PENINSULAR RAILWAY, VICTORIA TERMINAL BUILDINGS, BOMBAY.

Sir,—In your description last week [p. 268] of the above buildings, you omitted to mention the name of Mr. J. Griffiths, the Principal of the Bombay School of Art, under whose supervision and direction the models of the decorative carved detail were designed. Will you, therefore, please insert this letter, as it is due to Mr. Griffiths principally that this portion of the work has been so satisfactorily carried out? FREDERICK WM. SELVENS.

Bath, Oct. 15.

\*\*\* We print Mr. Stevens's letter; but we may observe that Mr. Griffiths's name and the part he took in the work were duly mentioned in the long account published in a former number of the *Builder*, and to which we referred the reader; and we thought it unnecessary to publish the same information twice.

# ECCLESIASTICAL ART EXHIBITION IN MANCHESTER.

Sir,—Will you allow us to state that the vases altar frontal mentioned with approval in your issue of Oct. 6 is entirely original, and was designed for this society by Mary Gemmell?

It is now in the Arts and Crafts Exhibition at the New Gallery.

THE SECRETARY TO THE DECORATIVE  
NEEDLEWORK SOCIETY,  
17, Sloane-street, S. W., Oct. 15.

# PROVINCIAL NEWS.

**Brighton.** The Hove Commissioners, at their meeting on Saturday last, passed a resolution in favour of carrying out, at the public cost, a new sea wall and esplanade at West Hove, in extension of what is locally known as the Medina "quarter-deck." In connexion with this it is proposed to erect an extensive and commodious bathing establishment and club-rooms, from designs by Mr. Paul B. Chambers, of the engineering details having been furnished by Messrs. Thos. Bradford & Co. We understand that it is largely due to the action of Mr. A. Hill, of the firm of Tooth & Co., that this improvement has been secured for Hove.

**Exeter.**—At a meeting of the Exeter Town Council on the 10th inst. (reported in the *Western Times* of the 11th inst.) the City Asylum Committee reported that the architect of the building (Mr. R. Stark Wilkins) reported to them on the 12th of September that he was at the reservoir on the Monday preceding and watched the north tank filled, and for three hours after, without detecting the fraction of an inch fall in the water; that the south tank was half full and still filling when he left, without any sign of leakage, and that he therefore believed the asphalt skirtings and angles, and the cement rendering of sides, to be made good, and hoped that after a fortnight's use of the reservoir the committee would be satisfied. At the same meeting a report from the engineer was presented that the water in the southern tank had sunk 5 in., and in the northern tank 3 in. In thirty-six hours. A report was read from the building sub-committee, who met at the asylum on August 24th. They reported that they visited the reservoir and saw five men were engaged cutting out small pieces of the asphalt bottom. This circumstance gave the committee an opportunity of examining the concrete beneath the asphalt and of taking a small sample, which sample they did not think was good. They also found that between the concrete bottom and the wall of the tank there was a small space of about 1/2 in. to 3/4 in. The committee were not able to say what the result of the work now being done might be, but could not refrain from remarking that this patching of a new work ought not to be required. The Committee had reason to think that the bottom of the tank was not of Claridge's asphalt, as required by the specification. They also reported that water from the roof found its way to the inside of the tanks, and ran down over the walls in many places, and on examining the roof they found the cement covering cracked in many places, and not more than a quarter of an inch thick in a part which was broken up, of which they took a sample, whereas the specification provided that the cement rendering on the top should be three-quarters of an inch in thickness. The Clerk was directed to call the attention of the architect to the substitution of another kind of asphalt for that specified, and to ask

him why such a substitution was made without the knowledge or consent of the Committee. The architect was also requested to report upon the thickness of the cement on the roof of the reservoir. A letter had been received from the architect in reply, in which he said that Mr. Phillips, the contractor, employed Messrs. Bradshaw to lay the asphalt. On learning this, he informed Mr. Phillips that Claridge's was mentioned in the specification. He thereupon guaranteed this to be equal to Claridge's; and, as he (the architect) knew that Bradshaw's was very generally used in Exeter, both by the Council and privately, and remembering the disposition of the Council to employ local people as far as possible, he thought there would be no objection to allowing the asphalt to remain. But he informed Mr. Phillips that the work of making good any faults or defects would entirely rest with him as being the best way of proving his guarantee of the asphalt to be correct. There was no concrete specified on the roof of the reservoir, but a rendering of Portland cement 3/4 in. thick. This he found to be about half an inch to five-eighths thick, and at his (the architect's) last visit Mr. Phillips was adding more rendering, so as to bring it up to the thickness as specified. With regard to the asphalt the architect had been requested to report to the Committee whether the leakage in the reservoir was in any way attributable to defects in the asphalt, and the whole matter would be further considered when the architect's report had been received. The Committee also directed the architect to be informed that the sample of cement taken by the Building Sub-Committee from the roof of the reservoir was but 1/2 in. thick, and that the Committee were of opinion that cement laid on in coats was not equal to cement laid down in conformity with the terms of the specification. Mr. Huxtable moved the adoption of the report, and had commenced some criticisms on the asylum building, when the Mayor said his attention had been called to the fact that there was not a quorum present, and the Council then adjourned.

**St. Albans.** The new hospital and dispensary at St. Albans, erected in honour of the Queen's Jubilee, were opened on the 10th inst. The building is of red brick, and has been erected from the designs of Mr. Alexander Graham, F.R.A., of London, by Mr. Alderman Michin, under the supervision of Mr. Ford, the City Surveyor. The following general description of the building appears in the *Herts Advertiser*:—"The new Hospital and Dispensary in the Verulam-road stands on an excellent site of rather more than an acre in extent. The building, which provides ward accommodation at present for twelve patients, has been designed with a view to future enlargement to meet the growing requirements of the city and the neighbourhood, and the additions could be made at any time at a comparatively small cost. The main entrance is on the north side, approached from Church-crescent, and the wards, which face the south and are on the ground storey, consist at present of a male ward for six beds, an accident ward for two beds, and a female ward for four beds. The height of the wards is 12 ft., and the cubic space allotted to each bed is rather more than 1,300 ft. Separate lavatories, slop-sinks, and water-closets are provided for males and females, all these being conveniently placed, and separated from the wards by a well-lighted corridor which runs straight through the building from end to end. Provision is also made for a nurse's room between the wards, a large bath-room, and an operating-room with a north light. A kitchen with separate external entrance, a scullery, and a serving lobby, are placed as nearly as possible in the centre of the building, and a larder and store-room, convenient of access, are provided in a small basement storey. A staircase off the main entrance hall leads to a set of rooms on an upper storey, consisting of a sitting and bedroom for the matron, a servant's room, linenry, and a good-sized room for convalescents. In connexion with the hospital proper is a dispensary for out-patients. This has a separate external entrance, but provision has been made for internal access from the hospital corridor. The arrangements comprise an entrance lobby, a spacious waiting-room, two consulting-rooms (one of which is available as a surgery in connexion with the hospital), and a dispensary. The post-mortem room has been placed in an angle of the site as a detached building. The entire block stands on a bed of

concrete, and the walls, which are constructed with local bricks of the best quality, are built with a hollow space. The roofs are covered with Ruabon tiles. The ward and corridor floors are of pitch pine, and the internal joinery is of the same material varnished. The wards are warmed by ventilating grates, and the corridors and other parts are heated by radiating pipe-coils, a small boiler for this purpose being fixed in the basement. Inlet shafts for ventilation are provided in the angles of the wards, and throughout the building, and extraction shafts are carried from the centres of the ceiling communicating with separate air-flues in the chimney-stacks. The fittings throughout are of the best make and of the simplest character, and the drains, waste and soil pipes are all ventilated, the drains being laid in straight lines with inspection chambers at the junctions. The grates, hot-water pipes, and other fixed ironmongery came from the works of Mr. D. O. Boyd, Maddox-street, London. The total cost of the building will be about £3,800.

**Swansea.** The *Western Mail* states that Mr. Bell, Borough Surveyor of Swansea, has made a report to the Works Committee in reference to the cost of lighting certain streets in the borough with electricity as compared with oil and gas respectively. The streets referred to are Mount-street, Castle-square, Castle-street, High-street, Alexandra-road, Grove-place, Craddock-street, Union-street, Oxford-street, and Temple-street. At the close of his report Mr. Bell says—"It will be seen that the electric light would give nearly nine times the candle-power of gas, and the annual cost would be about the same." The *Mail* understands that the members of the committee are practically unanimous in favour of the electric light.

**York.**—A meeting of the Municipal Officers Committee of the City Council of York was held last week, at the Guildhall, when the Lord Mayor presided, and there was a large attendance. The committee were engaged for some time considering the proposed alterations of the Guildhall, the suggested erection of municipal buildings in Blake-street, and the erection of police-buildings in Clifford-street. After deliberation, the committee unanimously resolved to recommend the Council to construct a Council Chamber, with a gallery capable of accommodating about 100 persons, and to proceed with such alterations of the premises adjoining the Guildhall as shall be necessary to provide accommodation for the Town Clerk, the Surveyor, and City Accountant. The Guildhall itself to be repaired and decorated in keeping with its ancient architecture. It is proposed here to provide accommodation for the transaction of all city business, and to remove the police business to Clifford-street. This is in accordance with the recommendations of the Watch Committee, and it is suggested that the buildings in Clifford-street should consist of police and fire brigade stations.

# CHURCH-BUILDING NEWS.

**Balham Hill.**—The Bishop of Rochester recently conducted the festival of harvest thanksgiving in the parish church of the Ascension, Balham Hill, and dedicated the new reredos and other decorations at the east end of this parish church, all the new work being the gift of Mrs. Fugh, of Clapham Common, in memory of her husband, the late Thomas Fugh. The new reredos, which stands under the central of the three arches supporting the main east wall of the church, is all of alabaster. It consists of a central carved panel of the Crucifixion, about 6 ft. by 4 ft wide, deeply recessed behind a richly-moulded and cusped arch. This arch supports a carved gable with ornamental crockets and cross at apex, and forms a canopy, the tympanum of which is enriched by mosaic panels. The reredos at the foot of the reredos, the front of which is decorated with seven panels of mosaic representing the emblems of the four Evangelists alternated with panels of ornament, is also of alabaster, specially selected of the darkest and most transparent colours. The central sculptured group, representing the Crucifixion, contains, besides the usual figure of Christ with the two thieves on either side, at the foot of the Cross St. Mary Magdalene with the Blessed Virgin and Mary of Cleopas on the left, and Mary the Mother of James, and St. John on the right hand. At the extreme right is the Centurion, and the background Roman soldiers and a city in low-relief. The whole of the outer east wall beyond the ambulatory



Hemmerling's stone, patented in 1883, is composed of glass furnace slag in a ground state mixed with from 2 to 30 per cent. of any desired coloring matter to which has been previously added one-third of its weight of soluble or water glass. This, when dry, is reduced to powder and kneaded up with solution of soluble glass; the paste is then placed in moulds to a moderate depth and backed up with a mixture of slag, sand, and cement. After pressing and drying for a few hours the stony mass is taken from the moulds, dipped in a solution of water-



glass, placed in water for four weeks, dried, and again dipped in water-glass.

Other products, such as Highton's patent "Victoria stone," in which is utilised the debris of granite quarries, will be described later on.

### Books.

*Cæsar in Kent: an Account of the Landing of Julius Cæsar and his Battles with the Ancient Britons.* By the Rev. FRANCIS T. VINE, B.A. (Elliot Stock.)

THE reputed landing-places of Julius Cæsar upon the coast of Britain are scarcely less numerous than the reputed birth-places of Homer. At the beginning of the last century Archdeacon Batteley made out an excellent case in favour of Richborough (the ancient *Rutupium*),—a place which, to this day, bears abundant traces of occupation by the Romans. The late Mr. Thomas Lewis advocated, with more than forensic skill, the claims of Romney Marsh; while those of Lynnepe (*Lemanis*) have been set forth by Mr. Beale Poste with no little ingenuity. But, after all, we agree with Mr. Vine that the balance of evidence is strongly in favour of Deal having been the post of debarkation on the first invasion, and Walmer, reached by a longer sea route, on the second. Cæsar's Commentaries are, of course, the chief text-book, and from them it is clear enough that the Roman general, sailing either from Boulogne or Calais, intended to land at Dover, as the nearest and most suitable point. But when he saw the British forces posted on all the hills and commanding the harbour, prudence suggested the selection of a spot where he could meet his opponents on more equal terms. There was no time to lose, for tide and wind had to be taken into account; and, as the breeze seems to have been blowing up channel, and, according to Halley's calculation, the tide in the afternoon of that particular day (August 25, B.C. 55) made in the same direction, the transport fleet sailed northwards and found a landing-place on the other side of the South Foreland. All this is very clearly made out by Mr. Vine, whose maps and plans enable the reader to understand the positions with accuracy. The country between Deal and Walmer is level and well adapted for the manoeuvres of disciplined troops, while the earthworks necessary for defending the camp (remains of which are still to be seen) could be constructed with ease out of the light, sandy soil. With Mr. Vine's general conclusions we thoroughly agree, and the information which he has collected from numerous sources as to early British trade and the military stations of the Roman invaders, is valuable and interesting. We do not always share in his estimate of the value of his authorities. Nennius is not a name that commands confidence, and we must confess to viewing with grave suspicion the statements gathered from the Welsh Triads. Mr. Vine, moreover, is not altogether consistent. He speaks, for instance, disparagingly of Plutarch and Dion Cassius, because they wrote, respectively, one and two hundred years after the events on which they comment; but, on the other hand, he attributes much weight to the traditions preserved by Camden and published by him some fifteen centuries afterwards. The tendency also to dogmatise is not wholly absent from Mr. Vine's treatise. He is too "cocksure" all round, and even in the region of etymology (which he has not made his own) offers himself as an infallible guide. Thus, in speaking of the battle that took place in East Kent, near a brook called by some old chroniclers "Mercedsburne," he makes the unqualified statement:—"The first part of the name was undoubtedly derived from the god Merced, or Mercury." We very much doubt whether such was the case. The Romans were a constructive people, and we naturally find their language in words relating to construction—roads (*strata*), bridges (*pontes*), walls (*valla*), and fortifications (*castrum* and *castra*); but the instances in which natural features were re-named by them are, we believe, extremely rare, and are not of the kind he supposes. However, these are minor blemishes in a book of decided merit, treating of a period of history in which every Englishman, whether scholar, antiquary, or otherwise, feels an interest.

*Primer of Micro-Petrology.* By W. MAWER, F.G.S. London: John Marshall & Co.; Hull: Elsom & Co. (No date).

THE author says that this little treatise is

devoted to the points to be observed in the application of the microscope, with and without the use of the polariscope, to the study of igneous and metamorphic rocks. As a matter of fact, however, we find it deals more with minerals individually than with rocks in which more than one mineral is present. It is true these latter are here and there alluded to, and the general characters of igneous rock-structure, texture, groundmasses, &c., are given in a masterly style with clear definitions; and the numerous illustrations show that the author really was thinking more of rocks than of minerals only, yet it is a pity he did not describe the diagrams in their proper places, and thus produce a result more in keeping with the title of the work. Indeed, he seems to have thought so himself, if we may judge from the short postscript on the subject. Moreover, although it professes to deal with metamorphic rocks, it only does so incidentally, if we except the description of chialotile in Skiddaw slate and of Carrara marble (pp. 52, 53). In dealing with rock-structure, for example, no allusion is made to the foliated structure so typical of gneiss, schist, &c., which is an essential point, and quite as important as the features characteristic of igneous rocks, described by the author. In view of the brilliant discoveries of late years amongst metamorphic rocks, we should think that metamorphic structure would have claimed a considerable amount of space, in a work professing to give the elementary outlines of micro-petrology. Following the fashion of the times, the author only just touches upon the microscopic appearance of aqueous rocks, so that sandstones, lime-stones, and the like are barely mentioned. Whatever shortcomings the work may have, however, we must say that it most admirably treats of the peculiar microscopic features of the chief rock-forming minerals, and we have not been able to detect any errors of description, so that if the author had given some such title as "The microscopic characters of the chief rock-forming minerals" to the work, it would have been much more appropriate, and nobody could then have found fault with it.

*A Practical Treatise on the Steam-Engine Indicator and Indicator Diagrams.* By A.M.I.C.E. Edited and enlarged by W. WORRY BEAUMONT, M.Inst.C.E., M.I.M.E. London: The Electrician Printing and Publishing Company.

THE indicator plays so important a part in enabling the engineer to design and adjust the steam-engine so as to get the most efficient result from its working, that the wonder is, not that there should be so many works devoted to its consideration, but that there should be so few. In the book under notice the author has not attempted to break new ground, but has performed the less ambitious, but far more useful task, of putting forward known and acknowledged facts in a plain manner. The author avoids mathematics, which, indeed, are quite unnecessary in a work of this sort, excepting for a display of the writer's erudition.

The opening chapters deal with different descriptions of indicators,—descriptions being given which are, with the aid of illustrations, sufficiently plain to enable any one to grasp the distinctive characteristics of the various forms mostly seen in use. A chapter on the necessary points to be observed in fixing the apparatus,—a most important detail, is next given. The diagram having been obtained, the lessons to be learned from it are next taken in hand, and this naturally forms the larger part of the book. On p. 70 the author comments on the mistake of expanding beyond a desirable range,—a process which causes far more loss in steam-engine working than the majority of users have any idea of. In an example given, steam is cut off at one-tenth the stroke, the terminal pressure being 3 lb. absolute, with a back pressure of 2 lb., or leaving 1 lb. to overcome engine-friction. This, the author rightly states, is not generally considered sufficient pressure to produce good results, if the view be taken that the terminal pressure must be enough to overcome engine-friction as well as back-pressure. To this view the author takes exception. He says, "The period during which pressure is below that necessary to balance back-pressure and engine-friction is small, and it is not quite so certain that a loss accompanies expanding to pressures below that balance." This is perfectly true, but the passage is open to objection, inasmuch as the author puts out of sight the crucial point, and is leading the student off the scent on a

side issue which may or may not apply. The main principle to keep in view when considering the most desirable terminal pressure in any one cylinder is the range of temperature during expansion in the cylinder; and whether steam-pressure is utilised in overcoming friction or doing useful work does not affect the principle, although it may lead to modification in detail. From what is said later, the author evidently has himself a clear perception of this, but when writing for the purposes of instruction each section should stand on its own bottom. In treating of theoretic expansion-curves and the application of Boyle's law, the author says of two particular diagrams:—"Practically, the departure by a minor quantity at the beginning, and by an excess in the latter part of the expansion, makes the indicator diagram-curve nearly identical in area with the theoretical or hyperbolic curve formed according to Boyle's law, and this is partly due to the steam admitted to fill clearance and port spaces, and partly to condensation in the beginning of the stroke. We shall, therefore, assume, for the purposes of calculation, that the expansion of steam in a steam-engine cylinder takes place according to this law, and that the curve representing the diminishing pressure, due to increase of volume, is a portion of a hyperbola." This is far too wide a generalisation, and, in fact, the author assumes too much. Of course, steam does not expand in accordance with Boyle's law, but, for purposes of comparison and investigation, the expansion-curve on the diagram may be compared to the hyperbolic curve. The fact that a portion of the useful effect lost in condensation is recovered by re-evaporation is also beyond dispute; but the author means that a given volume of steam entering a cylinder during the admission period of the stroke will expand after cut off, so as to give a curve approximately a hyperbola, reinforced by the steam in port and clearance, which is very much mistaken. If, on the other hand, he means that the total volume between the slide-face and piston, *i.e.*, the volume admitted to the cylinder during the admission period, plus the steam in port and clearance, will expand approximately in accordance with Boyle's law, he can only be accused of so much ambiguity of language, the more noticeable as it is a fault into which he very rarely falls. We think, also, that the loss of heat to the condenser during expansion ought to be more prominently brought forward.

The examples of indicator diagrams, illustrating the salient features of engine arrangement revealed by their means, are excellent objects-lessons, which may be read with interest by all engineers, and with instruction by a very large proportion.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

14,674, Spanners. A. Anderson.

In metal spanners with movable jaws a piece of screw and engaging-block is by this invention used for the purposes of greater security of strength.

14,776 Catches or Fasteners. S. Timings & S. Hill.

This invention has reference to those spring catches or fasteners for cupboards, windows, &c., which a bolt having an inclined end projects through a metal plate fixed to the door, so that on closing the door the bolt is caused to slide back into casing by its end coming in contact with an inclined striking-plate fixed to the door-jamb. When the door is closed the bolt is caused by its spring slide forward again beyond the striking-plate, maintaining the door in position; but on the door being opened, the bolt is caused to slide back into casing on passing the striking-plate. The improvement is effected by the inner end of the bolt being made to project through and being free to slide in a longitudinal slot in the base of the casing, being prevented from leaving the slot by a projecting pin on each side. The front opening in casing through which the bolt projects is so large enough to allow of the bolt swinging through a short space round its inner end as a centre, allowing swinging motion through, and being free to play to the bolt. The door may be opened a small space by the action of the bolt and spring, pulled back and securely closed until the door is again opened far enough for the end of the bolt to pass the striking-plate.

15,665, Manufacture of Cement. G. M. Layton.

According to this invention the red-hot clinker or clinker is caught as it falls from the furnace, passed on trolleys into air-tight chambers, where the heat is utilised to dry the "slurry" previously laid in the chambers.



566, Ventilators. H. Stockman.  
order to disperse foul air, gases, &c., from  
tunnels, or sewers, tubing is by this inven-  
tion in conjunction with a mouth and an out-  
let. A current is set up, either by the use of an  
outlet, or by leading one end of the tube to near  
the neck.

967, Blue Bricks, Tiles, &c. B. Gregory.  
instead of using blue or fire-clay, the inventor  
employs containing silica, which are pulverised  
added to common clay. Iron ore is also added,  
brickmaker rolling his clay in the pulverised

991, Ventilating Halls, &c. D. G. Hoey.  
inlets for vitiated air are by this invention  
placed near the roof or ceiling, and a gas-jet  
if necessary, to promote a current of air.  
fresh air is drawn in by several inlets from the  
level of the dado, and a wire screen or gauze  
is placed in an inclined position at the top of the  
inlets, so that fresh air may be quickly and uniformly  
distributed.

1864, Wood-working Machines. E. W. W.  
decker.

long and elaborate specification of this inven-  
tion sets forth the details of construction of a  
machine with several wood-working appliances to  
operated by foot-power. A jig-saw, band-saw,  
ladder, circular-saw, and boring attachment are  
combined with mechanism for turning square or  
round stock into circular form, all in the one  
machine.

251, Door-latches. R. Partridge.

An ordinary thumb-latch is made in two pieces  
of special shape, and by one piece passing  
through the other and being clipped by ears folded  
up, the use of rivets for fastening is dispensed  
with.

#### NEW APPLICATIONS FOR PATENTS.

Oct. 5.—14,827, A. Hutchinson, Construction of  
as. 14,838, W. Wilkie, Ventilators.—14,839,  
Leigh, Door-latches, &c.  
Oct. 6.—14,354, H. Edwards and Others, Process  
Manufacturing Cows.—14,358, W. Bishop, Slow-  
motion Stoves.—14,364, F. Rogers, Silent  
tension for Doors, Windows, &c.—14,382, T.  
ton, Opening, Closing, and Securing Skylights.  
—14,392, A. Noad, Decoration of Ceilings and  
walls.—14,402, E. Edwards, Self-acting Window-  
fasteners, &c.  
Oct. 8.—14,418, A. Ransford, Automatically  
lifting Star-lights and other Gas-fittings.—14,423,  
Stearns, Ventilator.—14,439, F. Simpkin, Safety  
Window-frame.  
Oct. 9.—14,454, B. Talbot, jun., Rain-troughs for  
Roofs of Buildings.—14,490, W. Sayer, Making  
gas Tiles, &c., from Plastic Clay.  
Oct. 10.—14,536, E. Stead, Moulding and Pressing  
clay, Blocks, and Slabs.—14,539, T. Stephenson,  
thinware Tiles.—14,542, R. Newton, Electric  
other Belts.  
Oct. 11.—14,557, J. Kirkbride, Window-sashes.—  
14,560, W. Jarvis, Chimney-tops.—14,628, W.  
Leigh, Water-taps.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

727, W. Plesford, Sharpening Plane-irons, Chisels,  
Joiners' Tools.—11,429, J. Parkinson and others,  
as. T-squares, &c.—11,711, T. & M. Howe,  
Circular Saws.—11,994, J. Cundall, Damp-proofing  
application to walls and foundations of build-  
ings.—12,061, M. Smith, Chimney-tops.—12,841,  
Jack, Cement, &c.—12,845, F. Alchin, Asphalte  
tiles, &c.—12,910, E. Thomson, Laying Wood  
boards.—12,957, T. Shoulter, Springs and Checks for  
doors, &c.—12,995, R. Parry, Cutting the length  
of Glass emitted from Brick-machines.—13,009, R.  
Lewthorpe and H. Garland, Door and other Bolt  
locks.—13,059, W. Jarvis, Wall-blocks for Build-  
ings.—13,115, W. Joyner, Roof-gutters.—13,561,  
Jamlin, Chimney-pieces.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

5,143, J. Cardwell and J. Chandler, Bolts for  
lifting Shop-window Shutter-bars, Sliding-sashes,  
&c.—15,470, E. Lofth, Ventilating.—16,619, S.  
dinger, Lift or Elevator for Staircases.—16,621,  
Larmanjat, Moulding, Pressing, and Drying Tiles  
in solid patterns.—17,005, H. Steven, Duct  
Fire-grates.—17,009, J. Garvie, jun., Steam  
Drum-drivers.—17,199, J. Shorrook, Drying Timber.  
—10,913, G. Davis, Drain-traps.—12,589, H.  
Leigh, Window-fasteners, &c.—12,734, C. Rogers,  
sides of Wood Sashes.—12,830, J. McChesney and  
Cobham, Sash-balance.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

Oct. 4.  
By A. SAYLE & SON (at Chingford).  
Chingford—A freehold cottage and 13a. or 7p. ... £2,000  
Hatcham—A plot of marsh-land, about 2a. ... 80  
Oct. 9.  
By DOWNING & CO.  
Hendon—Denmark-hill—The residence called  
"The Cedars," 68 years, ground-rent £20 ..... 1,100

By DAREHAM, TAWSON, & CO.  
City—64, Queen-street, 35 years, ground-rent £300 23,000  
Bermundsey—35 and 36, Alderman-street, 51 years,  
ground-rent £8 ..... 475  
Brixton—Ground-rent of £10, reversion in 75 years  
By G. NEWMAN (at Ashford-road).  
Primrose Hill—30, Elsworth-road, 78 years, ground-  
rent £4 ..... 1,110

Oct. 10.  
By GUY & HARRISON.  
Kingland 16, Upton-grove, 33 years, ground-rent  
£4 10s. .... 360  
Rotherhithe—The first plant of the Nelson Dry  
Dock and Patent Slip, with house and offices,  
freehold ..... 8,650

By MADDOX & SON.  
Finchley-road—No. 78, known as "Home Lodge"—  
The lease of, term 14 years ..... 180

By CHESTERMAN & SONS.  
Kensington—55, Earl's Court-road, 62 years,  
ground-rent £6 17s. .... 685  
8 and 9, Alma-terrace, freehold ..... 1,910  
Ground-rent of £34, reversion in 72 years ..... 805  
1, 2, and 4, Catherine-terrace, 28 years, ground-  
rent £9 14s. .... 710  
Ashley Cottages—Ground-rent of £12, term 50  
years ..... 220  
Shaftesbury-road—Ground-rent of £83, term 50  
years ..... 1,185  
Shaftesbury-terrace—Ground-rent of £12, term  
50 years ..... 1,175  
Fenelon-road—Ground-rent of £29 10s., term  
50 years ..... 695  
Shaftesbury-road—Four plots of garden ground,  
50 years, no ground-rent ..... 130

By FAREBROTHER, ELLIS, & CO.  
Gordon-square—No. 23, term 67 years, ground-rent  
£11 12s. 4d. .... 2,230  
Hatcham-road—77, Chippendale-road, 75 years,  
ground-rent £10 ..... 370  
Brookley—A plot of land, 1a. 1r. 14p., term 74 years,  
ground-rent £12 ..... 490  
A plot of land, 2a. 0r. 25p., term 74 years, ground-  
rent £12 ..... 710

Oct. 11.  
By NEWSON & HARDING.  
Barnsbury—20, Albert-terrace, 59 years, ground-  
rent £8 ..... 200  
49, John-street, 20 years, ground-rent £5 ..... 200  
Highbury—2, Elwood-street, freehold ..... 260  
5 to 15, Myrtle-street, freehold ..... 550  
30, Mossall-road, freehold ..... 280  
18 and 20, Chatterton-road, freehold ..... 670  
116, Blackstock-road, freehold ..... 415  
Two plots of freehold land ..... 410  
Ground-rent of £12, reversion in 58 years ..... 400  
Ground-rent of £15, reversion in 50 years ..... 425  
Ground-rent of £4, reversion in 48 years ..... 115  
Ground-rent of £10, reversion in 65 years ..... 310

By C. C. & T. MOORE.  
Rotherhithe—20, Princes-street, freehold ..... 300  
Hackney—90 to 98, even, White Post-lane, 71 years,  
ground-rent £19 ..... 460  
Wandsworth—30, 38, and 40, Milton-road, 70 years,  
hold ..... 700  
42, 44, and 46, Milton-road, freehold ..... 700

By D. YOUNG.  
Battersea—38 and 40, Northcote-road, freehold ..... 2,440

By E. SERRAVALLO.  
Bermundsey—75, Alcock-road, 35 years, ground-  
rent £5 10s. .... 460  
15, 16, and 18, Limasol-street, 12 years, ground-  
rent £6 ..... 135  
Brixton—36 and 38, Kellist-road, 54 years, ground-  
rent £14 ..... 635  
20, 22, and 24, Wanless-road, 78 years, ground-  
rent £13 10s. .... 580  
Peckham—13 to 11 odd, Gordon-road, freehold ..... 2,150  
Newington Causeway—35, 37, and 39, Wellington-  
street, and 1a. 1r. 1p., 2 Dorset-street, 21 years,  
ground-rent £58 ..... 355

Oct. 12.  
By HORNE, SON, & EVERSFIELD.  
City of London—65 and 66, Fetter-lane, freehold;  
and a ground-rent of £34, reversion in 42 years ..... 7,300  
Tooley-street—Nos. 16 and 18, freehold ..... 2,390  
By BAKER & SONS.  
Friern Barnet, Oakleigh Park-road—The freehold  
residence, "Beaufort" ..... 2,550  
The freehold residence, "Clydevale" ..... 1,100  
Freehold residence, "Claremont" ..... 1,700  
Three plots of freehold land ..... 985  
Romford—Ground-rent of £4, reversion in 98 years ..... 150  
City of London—13, Bishopsgate-avenue, 65 years,  
ground-rent £26 ..... 400  
18 and 19, Bishopsgate-avenue, 65 years, ground-  
rent £250 ..... 650

#### MEETINGS.

MONDAY, OCTOBER 23.  
Society of Antiquaries of Scotland (Rhind Lectures in  
Archæology).—Mr. E. Munro, M.A., on "The Lake  
Dwellings of Europe," II. 4 p.m.  
WEDNESDAY, OCTOBER 25.  
Society of Antiquaries of Scotland (Rhind Lectures in  
Archæology).—Mr. E. Munro, M.A., on "The Lake  
Dwellings of Europe," III. 4 p.m.  
Institution of Mechanical Engineers.—Ordinary General  
Meeting in London. (1) Discussions on Mr. H. R.  
Towns' paper on "Kinney's Testing Machine," and on the  
Hon. C. A. Parson's paper on "The Compound Steam  
Turbine and Turbo-Electric Generator." (2) Time permit-  
ting, Papers by Mr. A. W. N. Tyrrell on "The Bath-  
mines and Rather Township Waterworks," and by Mr.  
Thomas Freuhart, on "The Use of Petroleum Refuse as  
Fuel in Locomotive Engines." 7.30 p.m.  
THURSDAY, OCTOBER 26.  
Institution of Mechanical Engineers.—Ordinary General  
Meeting in London (continued). 7.30 p.m.  
FRIDAY, OCTOBER 27.  
Society of Antiquaries of Scotland (Rhind Lectures in  
Archæology).—Mr. E. Munro, M.A., on "The Lake  
Dwellings of Europe," IV. 4 p.m.

#### Miscellaneous.

**Ravenscourt Park, Hammersmith.**—At  
the meeting of the Metropolitan Board of  
Works on the 12th inst., Mr. Brown introduced  
a deputation from the Vestry of Hammersmith,  
who presented a memorial praying the Board to  
take down the fencing erected on the south side  
of Ravenscourt Park, and put up a fence that  
would permit of the grounds being seen by the  
public in passing, and by the residents in the  
houses facing the park. Mr. Lethbridge, who  
spoke for the deputation, said the Vestry, in  
subscribing half the money, felt that the Board  
would look after their interests. The inhabi-  
tants of Hammersmith had been accustomed  
for years to have a good view from the roadway  
of the forest trees and so forth of the park, but  
now the Board had erected a fence so closely  
barred that they could not see through it. The  
residents in the neighbourhood were also much  
annoyed because of the lessening of the value  
of their property. The present fence, he  
observed, was a cross between a builder's  
hoarding and what might be called a colonial  
fence. Mr. Brown introduced another deputation  
from the resident ratepayers of Ham-  
mersmith, who also presented a memorial on the  
subject. Major-General Goldsworthy, M.P. for  
the borough of Hammersmith, was spokesman  
for this deputation. The memorials were re-  
ferred to the Parks Committee for consideration  
and report, the Chairman observing that the  
evident feeling of the Board was in favour of a  
different kind of fence being erected from what  
was now in existence.

**Forthcoming New Books.**—Among Messrs.  
Crosby Lockwood & Co.'s announcements for  
the present season we notice the following  
works:—"Practical Surveying," a text-book for  
students preparing for examinations or the  
colonies. By George W. Usill, A.M.I.C.E., with  
upwards of 330 illustrations. Crown 8vo.—The  
same publishers also announce for immediate  
publication—"Tables, Memoranda, and Calcula-  
tured Results, for Farmers, Agricultural  
Students, Graziers, Surveyors, Land Agents,  
Auctioneers, &c." with a new system of farm  
book-keeping. By Sidney Francis. Waiscoat  
pocket size.—"Turning," a text-book on the  
elementary principles and practice of using the  
lathe, with numerous engravings and diagrams.  
By P. N. Hasluck. Crown 8vo.—"The  
Number and Weight Calculator," showing in  
single tables the value at 421 different rates  
(from  $\frac{1}{2}$  of 1d. to 20s.) of any number of  
articles from 1 to 20,000, or any number of  
tons, cwt., qrs., and lbs. from 1 to 1,000. By  
Wm. Chadwick. Second Edition. 8vo. Revised  
and specially adapted to the apportionment of  
mileage charges for railway traffic. Also the  
following works in their popular "Weale's  
Rudimentary Series":—"The Art of Practical  
Brick Cutting and Setting," showing the most  
advanced methods of setting out, taking off and  
applying bevels for arches, groins, cones, domes,  
columns, walls, mouldings, &c., with remarks  
on bricks, mortar, artificial stone, &c., and rules  
for mensuration of gauged work." By Adam  
Hammond, author of "Practical Bricklaying."  
With 90 engravings. "Plumbing," a Text-book  
to the Practice of the Art or Craft of the  
Plumber. By William Paton Buchan. Fifth  
Edition. Thoroughly revised and enlarged,  
with many additional illustrations.—"Modern  
Workshop Practice." By J. G. Winton. A  
new edition.

**Renaissance Vase.**—Mr. Claude Phillips  
writes to us in reference to the fine vase of  
which we published an illustration last week,  
to say that he knows the work, though  
he does not know its present whereabouts,  
and that it is a comparatively modern  
work in Renaissance style, by a late famous  
French craftsman, Antoine Vechte. The  
actual work, if we had seen it, would, of course,  
have shown its modern character, which a  
drawing does not indicate in the same way.  
As it came to us among some drawings of work  
obviously ancient, we concluded that this also  
was a specimen of old work. It says much for  
Vechte that he should have reproduced so much  
of the nobility of style and modelling charac-  
teristic of Italian Renaissance work.

**The Nineteenth Century Art Society.**—  
Saturday, the 27th inst., has been appointed  
for the private view of the autumn exhibition  
(the sixteenth) of the Nineteenth Century Art  
Society, at the Conduit Street Galleries, and  
the exhibition will open to the public on Mon-  
day, the 29th inst.



**Tramways Wanted for East Dulwich.**—At the meeting of the Metropolitan Board of Works on the 12th inst., Mr. E. Dresser-Rogers introduced a deputation from the inhabitants of East Dulwich, who presented a memorial in favour of an extension of the tramway from East Dulwich to the Chomert-road and High-street Peckham. Mr. Richard Seely said for many years a means of communication had been wanted between Dulwich and Peckham, and at the present time, in consequence of this want, there was a large number of empty houses in the locality, representing a rateable value of 20,000l. Another argument in favour of the tramways was that the Metropolitan Board of Works were now laying out Dulwich-park, which would be visited by thousands of persons from Peckham and from all parts of London. Mr. Andrew Middlemass introduced a deputation from inhabitants of Peckham with a memorial on the same subject. Mr. Perry, spokesman for the deputation, said the memorial was signed by 670 inhabitants of Peckham, who felt that this was a case where the minority should give way to the majority, because the tramways would be for the benefit of the masses. He submitted that Rye-lane, with the exception of a very small portion—about 50 ft.—was of the statutory width required for the purpose, and he mentioned the names of several thoroughfares where there were double lines of tramway, which were not of the statutory width in all their lengths. Among these were the High-road to Woolwich, Loughborough Junction, Queen's-road, Peckham, Nine Elms-lane, High-street, Vauxhall, Mare-street, Hackney, and East-road, City-road. Mr. Middlemass also introduced a deputation from the Vestry of Camberwell, who presented a resolution in favour of the same object. Mr. G. C. Whiteley, Chairman of the Vestry, who spoke for the deputation, observed that the Camberwell Vestry were nearly unanimous in favour of the tramway extension in Rye-lane. The question had been before the Vestry of Camberwell and the Metropolitan Board for seven years, and now there was an opportunity of having the matter settled. East Dulwich was a large district, containing some forty or fifty thousand inhabitants, and no part of the metropolis was so completely isolated from the great centre of the population as was East Dulwich. There were nearly 1,000 houses empty in the district, and, although there might have been some over-building, he, as a resident in the neighbourhood, could state that the want of communication was one of the principal causes of the houses being unoccupied. The memorials were referred to the Works and General Purposes Committee.

**Institution of Mechanical Engineers.**—The ensuing ordinary general meeting of this Institution will be held on Wednesday and Thursday next, Oct. 24 and 25, at 25, Great George-street, Westminster, by permission of the Council of the Institution of Civil Engineers. The chair will be taken at half-past seven p.m., on each evening, by Mr. Charles Cochrane, Vice-President, in the absence of the President, Mr. Edward H. Carbutt, who is travelling in America. The ballot-lists for the election of new Members, Associates, and Graduates, having been previously opened by the Council, will be presented to the meeting, and the names of those elected will be announced. The nomination of officers for election at the next annual general meeting will take place. The discussions will be resumed on the following papers read at the last two meetings in May and August:—"Description of Emery's Testing Machine," by Mr. Henry R. Towne, of Stamford, Connecticut, U.S.A.; "Description of the Compound Steam Turbine and Turbo-Electric Generator," by the Hon. Charles A. Parsons, of Gateshead. The following papers will be read and discussed, as far as time permits:—"Description of the Rathmines and Rathgar Township Water Works," by Mr. Arthur W. N. Tyrrell, of London; "Supplementary Paper on the use of Petroleum Refuse as Fuel in Locomotive Engines," by Mr. Thomas Urquhart, Locomotive Superintendent, Grazi and Tsaritino Railway, South-East Russia.

**Gas in Theatres.**—The stage of the Parc Theatre, Brussels, has recently been lighted by means of the Wenham "Safety" gas-lamp, and we are informed that the experiment is a complete success. This is a move in the right direction, as the use of naked lights over the stage is a source of great danger. The Wenham lamp, as our readers know, is entirely enclosed. The lamps have also recently been used at the Promenade Concerts, Covent Garden.

**Arthur-street West.**—Whenever great engineering undertakings are in progress in the midst of densely-crowded thoroughfares there is always considerable danger that damage may be done to surrounding property, and such has been the case in connexion with the excavations now being made for the terminus of the City and Southwark Subway. Every care appears to have been taken to prevent misadventure, for which purpose the engineers have sunk to a depth of 67 ft. below the pavement. The tunnels, which consist of iron tubes 20 ft. in diameter, have been put in without accident, and the trouble appears to have arisen only from the works at the station. The entrance to this is at the corner of Arthur-street East, where hydraulic lifts will convey passengers to and from the level of the line. The platform will extend under King William-street, and along Arthur-street West as far as Miles-lane, up to which point the width of the station is about 27 ft. Here are at present a large staff of labourers finishing the work, the wooden frames for which are still standing. There can be no doubt that the houses at the corner of Arthur-street West present a dangerous appearance, with buttresses and struts projecting from them on all sides, and an alarming notice from the Commissioners of Sewers, dated early in September, calling on the tenants of 32, King William-street to vacate possession, and begin pulling down their property within six days. Some subsidence had certainly taken place in the buildings, but it is probably more apparent than real, and it is by no means certain that in its entirety it can be traced to the operations of the Subway Company. The whole of this part of King William-street was formed of mud excavated from the Thames, at the building of London Bridge, and the street, therefore, being "made" soil—even after fifty years' pounding—is likely to give when tunneling goes on beneath it. We have it on the best authority that there is no danger to the traffic, and that the Monument is not in the least affected by the excavations.—*City Press.*

**The English Iron Trade.**—The English iron market has been getting stronger during the week, the results of the quarterly meetings having contributed towards the improvement. Owing to the greater stiffness of makers of pig iron, who are getting more cautious in binding themselves for forward deliveries, in consequence of the threatened wages difficulty in the coal trade, and the prospect of a material advance in the price of fuel, business in crude metal has been restricted; but there are no signs of their giving way. The Scotch warrant market has been firmer, and quotations this week show a rise over those of last week. Middlesbrough iron may be said to be 6d. a ton higher, and is now 35s. for prompt with makers, although merchants are underselling them by about 6d. a ton. Bessemer iron is very steady at 44s. 6d. in the north-west of England. In Staffordshire and Worcestershire the improvement in pig-iron established at the quarterly meetings varies between 2s. 6d. and 5s. a ton upon last quarter's rates. Finished iron is still actively dealt in at the full prices of last week, and there is another advance in black sheets of 2s. 6d. a ton, and a similar rise in Welsh bars. Although not much actual business is passing in tin-plates, inquiries are once more active, and previous prices are firmly held by makers. The steel market maintains its firm tone, which is chiefly due to the large consumption of ship-building material; but the general steel trade is also sound, business in rails having likewise recovered. Shipbuilders continue active, and engineers well engaged, new work still coming forward in both departments.—*Iron.*

**Sale of the Three Nuns Hotel, Aldgate.**—About a fortnight ago the lease and goodwill of this hotel were offered for sale at the Mason's Tavern, by Messrs. Fleuret & Co., in consequence of the death of Mr. Deputy East, the owner of the property. The ground-landlords are the Metropolitan Railway Company. The particulars stated that the hotel was held on a long lease, at a rental commencing at 1,400l. a year, with advances in succeeding years. There was a very numerous attendance. The bidding commenced at 15,000l., advancing to 18,000l., on which the competition ceased, when Mr. Fleuret said he could not sell at such a price, as the property was considered to be worth a much larger sum. It was withdrawn at 25,000l., which was announced as the reserve, and within the last few days the property has been sold at that price.

**National Registration and Technic Education of Plumbers.**—The West of Scotland Technical College authorities and the District Council, acting in conjunction with the Plumbers' Company, have started technical classes for plumbers. The introductory lecture was delivered on the 11th inst. in the large hall of the Christian Institute, Glasgow. There was a very large attendance, upwards of 100 plumbers, masters, operatives, and apprentices, from all parts of the district being present. Mr. Thos. Russell, one of the Governors of the Institute, presided, and, in introducing the lecturer, urged the students to remember the responsibility for human life which rested with plumbers. The lecturer was Mr. J. V. Clarke, the first practical plumber who succeeded in obtaining the Company's Freedom by passing in honours the prescribed examination in the principles and practice of the craft. Prof. Jamieson and several of the governing body of the Institute were present, and Alderman Knibb (in the absence of the Master of the Plumbers' Company) gave some account of the progress made and the measures which the Company are taking to extend the registration and technical training of plumbers upon a national basis. At the opening of the session of the Plumbers' Classes at the Polytechnic, London, Mr. V. Digby Seymour, Q.C., represented the Company and announced that they had decided to award prizes to the successful students in the various branches of plumbers' work. It was mentioned that upwards of seven hundred plumbers had already been registered in the district.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                 |           | £. | s. | d. | £. | s. | d. |
|-----------------------------------------|-----------|----|----|----|----|----|----|
| Teak, E.I.                              | load      | 8  | 0  | 0  | 12 | 10 | 1  |
| Sequoia, U.S.                           | foot cube | 0  | 2  | 3  | 0  | 8  | 0  |
| Birch, Canada                           | load      | 2  | 15 | 0  | 4  | 15 | 1  |
| Fir, Baltic, &c.                        | load      | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                     | load      | 2  | 0  | 0  | 4  | 0  | 0  |
| Canada                                  | load      | 1  | 0  | 0  | 3  | 10 | 0  |
| Pine, Canada red                        | load      | 2  | 10 | 0  | 3  | 10 | 0  |
| " yellow                                | load      | 2  | 10 | 0  | 3  | 10 | 0  |
| Lath, Danube                            | fathom    | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                          | load      | 5  | 0  | 0  | 6  | 0  | 0  |
| Walrus, Odessa, crown                   | load      | 2  | 10 | 0  | 15 | 0  | 0  |
| Deals, Finland, 2nd and 1st             | std. 100  | 7  | 0  | 0  | 10 | 0  | 0  |
| " 4th and 3rd                           | std. 100  | 7  | 0  | 0  | 9  | 0  | 0  |
| Riga                                    | std. 100  | 7  | 0  | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow              | std. 100  | 9  | 0  | 0  | 10 | 0  | 0  |
| " 2nd                                   | std. 100  | 9  | 0  | 0  | 10 | 0  | 0  |
| " white                                 | std. 100  | 7  | 10 | 0  | 10 | 0  | 0  |
| Swedish                                 | std. 100  | 7  | 10 | 0  | 10 | 0  | 0  |
| White Sea                               | std. 100  | 8  | 10 | 0  | 17 | 10 | 0  |
| Canada, Pine, 1st                       | std. 100  | 16 | 0  | 0  | 25 | 10 | 0  |
| " 2nd                                   | std. 100  | 10 | 10 | 0  | 17 | 10 | 0  |
| " 3rd, &c.                              | std. 100  | 7  | 10 | 0  | 10 | 0  | 0  |
| " Spruce, 1st                           | std. 100  | 3  | 0  | 0  | 10 | 0  | 0  |
| " 3rd and 2nd                           | std. 100  | 7  | 0  | 0  | 8  | 10 | 0  |
| New Brunswick, &c.                      | std. 100  | 6  | 10 | 0  | 5  | 0  | 0  |
| Battens, all kinds                      | std. 100  | 5  | 10 | 0  | 12 | 0  | 0  |
| Floors, all kinds                       | std. 100  | 0  | 11 | 0  | 0  | 14 | 0  |
| Boards, 4 in. x 12 in., prepared, first | std. 100  | 0  | 8  | 0  | 0  | 10 | 0  |
| Second                                  | std. 100  | 0  | 6  | 0  | 0  | 7  | 0  |
| Other qualities                         | std. 100  | 0  | 5  | 0  | 0  | 0  | 0  |
| Cedar, Cuba                             | foot      | 0  | 0  | 31 | 0  | 0  | 0  |
| Honduras, &c.                           | foot      | 0  | 0  | 31 | 0  | 0  | 0  |
| Australian                              | foot      | 0  | 0  | 2  | 0  | 0  | 0  |
| Mahogany, Cuba                          | foot      | 0  | 0  | 41 | 0  | 0  | 0  |
| St. Domingo, cargo assay                | foot      | 0  | 0  | 41 | 0  | 0  | 0  |
| Mexican                                 | foot      | 0  | 0  | 4  | 0  | 0  | 0  |
| Tobacco                                 | foot      | 0  | 0  | 43 | 0  | 0  | 0  |
| Honduras                                | foot      | 0  | 0  | 43 | 0  | 0  | 0  |
| Box, Turkey                             | foot      | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian                         | foot      | 0  | 0  | 44 | 0  | 0  | 0  |

#### METALS.

|                            |     |     |    |   |    |    |   |
|----------------------------|-----|-----|----|---|----|----|---|
| Iron—Bar, Welsh, in London | ton | 4   | 17 | 6 | 5  | 0  | 0 |
| " at works in Wales        | ton | 4   | 7  | 6 | 4  | 0  | 0 |
| " Staffordshire, in London | ton | 5   | 5  | 0 | 6  | 15 | 0 |
| COPPER                     |     |     |    |   |    |    |   |
| British, cake and ingot    | ton | 80  | 0  | 0 | 81 | 0  | 0 |
| Best sale red              | ton | 81  | 10 | 0 | 82 | 0  | 0 |
| Sheets, strong             | ton | 84  | 0  | 0 | 88 | 0  | 0 |
| Chili, bars                | ton | 79  | 0  | 0 | 80 | 0  | 0 |
| YELLOW METALS.             |     |     |    |   |    |    |   |
| LEAD                       |     |     |    |   |    |    |   |
| Pig, Spanish               | ton | 11  | 7  | 6 | 0  | 0  | 0 |
| English, common brands     | ton | 14  | 12 | 6 | 0  | 0  | 0 |
| Sheet, English             | ton | 15  | 12 | 6 | 0  | 0  | 0 |
| SPIRITS                    |     |     |    |   |    |    |   |
| Slesian, special           | ton | 14  | 17 | 6 | 13 | 0  | 0 |
| Ordinary brands            | ton | 15  | 12 | 6 | 18 | 15 | 0 |
| TIN                        |     |     |    |   |    |    |   |
| Straits                    | ton | 101 | 0  | 0 | 0  | 0  | 0 |
| Australian                 | ton | 101 | 0  | 0 | 0  | 0  | 0 |
| English, Ingots            | ton | 104 | 0  | 0 | 0  | 0  | 0 |
| ZINC—English sheet         | ton | 22  | 10 | 0 | 23 | 10 | 0 |

#### OILS.

|                        |        |    |    |   |    |    |   |
|------------------------|--------|----|----|---|----|----|---|
| Linseed                | ton    | 19 | 17 | 6 | 20 | 0  | 0 |
| Cotton                 | ton    | 28 | 10 | 0 | 27 | 10 | 0 |
| Coconut, Cochiti       | ton    | 25 | 5  | 0 | 25 | 10 | 0 |
| Palm, Lagos            | ton    | 23 | 10 | 0 | 24 | 0  | 0 |
| Rapeseed, English pale | ton    | 30 | 0  | 0 | 0  | 0  | 0 |
| " brown                | ton    | 29 | 10 | 0 | 0  | 0  | 0 |
| Cottonseed, refined    | ton    | 22 | 15 | 0 | 0  | 0  | 0 |
| Tallow and Oleine      | ton    | 19 | 0  | 0 | 46 | 6  | 0 |
| Lubricating, U.S.      | ton    | 5  | 0  | 0 | 6  | 0  | 0 |
| " refined              | ton    | 7  | 0  | 0 | 12 | 0  | 0 |
| TRENTINE               |        |    |    |   |    |    |   |
| American, in casks     | cwt.   | 1  | 13 | 0 | 1  | 13 | 0 |
| TAR                    |        |    |    |   |    |    |   |
| Stockholm              | barrel | 1  | 1  | 6 | 0  | 0  | 0 |
| Archangel              | barrel | 0  | 11 | 0 | 0  | 1  | 0 |



# COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## COMPETITION.

| Nature of Work.                     | By whom required.     | Premium.          | Designs to be delivered. | Page. |
|-------------------------------------|-----------------------|-------------------|--------------------------|-------|
| up out Property as Pleasure Grounds | Penzance Town Council | 20 gs. and 10 gs. | Oct. 27th                | ii.   |

## CONTRACTS.

| Nature of Work, or Materials.           | By whom required.        | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------|--------------------------|-----------------------------------|--------------------------|-------|
| Making and Paving Works                 | Hammersmith Vestry       | H. Mair                           | Oct. 24th                | ii.   |
| Chalkley, Bermondsey, &c.               | Levensham Board of Works | Official                          | Oct. 30th                | xiii. |
| itional Tanks, &c., at Sewage Works     | Billersey U.R.S.A.       | do.                               | do.                      | xi.   |
| pital and Mortuary                      | Richmond Union           | do.                               | do.                      | xi.   |
| low Dead Buildings, Thames Ballast, &c. | Chelsea Vestry           | G. R. Strachan                    | do.                      | xi.   |
| ck of Buildings                         | Vestry of St. Giles      | P. R. Whellock                    | Oct. 31st                | ii.   |
| Ranking and Paving Works                | Fulham Vestry            | J. W. Norrington                  | do.                      | xiii. |
| ic Library                              | Battersea Public Libr.   | E. W. Mountford                   | Nov. 1st                 | xiii. |
| cks and Repairs to Buildings            | Com. of H.M. Works       | Official                          | Nov. 2nd                 | ii.   |
| King-up Roads                           | Friern Burnt L.I. Bnd.   | G. Clarke                         | do.                      | ii.   |
| removal of Fine Ash and Clinkers        | St. Mary's (Battersea)   | J. T. Pilditch                    | Nov. 3rd                 | xi.   |
| Work for Making Public Pleasure Grounds | Bournemouth Com.         | G. R. Andrews                     | Nov. 8th                 | xi.   |
| ic Library                              | Chelsea Public Library   | Karslake & Mortimer               | Nov. 9th                 | ii.   |
| struction, &c., of Church, Southampton  | The Committee            | W. H. Mitchell                    | Nov. 12th                | xi.   |
| ace Walk, Shelter Hall, &c.             | Brighton Town Council    | P. C. Lockwood                    | Nov. 15th                | xi.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised. | Salary.        | Applications to be in. | Page. |
|------------------------|---------------------|----------------|------------------------|-------|
| itary Inspector        | Derby U.S.A.        | 150 <i>l</i> . | Oct. 27th              | xvi.  |
| stant Borough Surveyor | Leicester Council.  | 300 <i>l</i> . | Oct. 31st              | xvi.  |

## TENDERS.

Communications for insertion under this heading must be in not later than 12 Noon on Thursdays.]

**BERMONDSEY.**—For altering and partially rebuilding building at South-street, Long-lane, for Mr. Denman. Mr. Ward Cross, architect, 32, Bermondsey-square, S.E. No. 1000.

White & Co., Rotherhithe. . . . . 180 0 0  
Kippes, Bermondsey. . . . . 180 0 0  
Crocker, Great Dover-street. . . . . 154 0 0  
\* Accepted.

**BRISTOL (Devon).**—For Board School Buildings for children, for the Brixham School Board. Mr. Geo. Lapham, architect, Torquay.

R. Yeo, Torquay. . . . . 4,487 0 0  
H. Webber, Paignton. . . . . 4,450 0 0  
Sander & Son, Torquay. . . . . 4,200 0 0  
W. A. Goss, Torquay. . . . . 4,182 0 0  
M. Bridgman, Paignton. . . . . 4,049 0 0  
H. Rabich, Paignton. . . . . 3,989 18 0  
Brooks & Ash, Totnes. . . . . 3,989 0 0  
E. P. Bovey, Torquay. . . . . 3,986 0 0  
Barrow, Newton Abbot. . . . . 3,910 0 0  
McKellar, Torquay. . . . . 3,485 0 0  
E. W. Vanstone, Paignton. . . . . 3,439 0 0  
Hazelwood Bros., Brixham. . . . . 3,760 0 0  
\* Recommended to be accepted.

**BROMLEY (Kent).**—For the erection of a residence, secretary, heating-chamber, &c., in the Highgate-road, Bromley, Kent, for Mr. Geo. Kitchen, Mr. Walk & A. Bapty, architect, Bromley. Quantities by Mr. William H. Budge, E.C. —

Douglas Payne, Bromley. . . . . £3,581 0 0  
Thomas Crossley & Son, Bromley. . . . . 3,416 0 0  
J. C. Arnall & Son, Bromley. . . . . 3,397 0 0  
Thos. Gregory & Co., London. . . . . 3,377 0 0  
E. A. Roome, London (accepted). . . . . 3,197 0 0

**BROMLEY (Kent).**—For the erection of four shops and cell in the High-street, Bromley, Kent, for Mr. D. W. Cris. Mr. Walter A. Williams, architect, Bromley.

Quantities by Mr. William Mills, 25, Budge-row, E.C. —

Douglas Payne, Bromley (accepted). . . . . £4,800 0 0

**BROMLEY (Kent).**—For alterations and additions to Bromley Steam Brewery, for Mr. J. A. S. Jones. Mr. W. Smith (accepted). . . . . £150 0 0

**BATHING TOWN, E.**—For building four shops in the town, Channing Town, for Mr. F. Bethell. Mr. F. H. Bethell, architect, 174, Bishopsgate-street, London.

Burton. . . . . £1,168 0 0  
Adams & Fox. . . . . 1,150 0 0  
Wyles & Williams, architect, Bromley. . . . . 1,134 0 0  
Buckland (accepted). . . . . 1,080 0 0

**BATHING TOWN, E.**—For heating apparatus at St. Luke's Church, Bathing Town, for Mr. F. Bethell. Mr. F. H. Bethell, architect, 174, Bishopsgate-street, London.

John Grundy, London (accepted). . . . . £110 0 0

**BATHING TOWN, E.**—For heating apparatus, Cowthorne Church, Mr. A. W. Blomfield, A.R.A., architect, London.

John Grundy, London (accepted). . . . . £120 0 0

**DUBLIN.**—For heating apparatus at St. Kevin's Church, Dublin. Mr. Thos. Drew, R.E.A., architect, Dublin.

John Grundy, London (accepted). . . . . £135 0 0

**EGHAM.**—For the erection of new stables and coach-house, Queen's-road, for Mr. W. J. Smith.

Hutt & Satchell, Richmond. . . . . £141 10 0  
Searle & Son, Egham. . . . . 137 0 0  
Oades Bros., Egham. . . . . 135 0 0

**GRAVESEND.**—For erecting new warehouse for Messrs. Masters & Co. Mr. Wadmore, 35, Gt. St. Helen's, E.C., architect.

H. Martin. . . . . £1,020 0 0  
Milton & Wallis. . . . . 719 0 0  
A. C. Rayer. . . . . 719 0 0  
W. & E. Wallis. . . . . 673 0 0  
W. H. Archer (accepted). . . . . 610 0 0  
[All of Gravesend.]

**HARROW.**—For alterations at "The Case is Altered" public-house, for Messrs. Benkin & Co. Mr. C. F. Ayres, architect, Watford.

W. B. Neal, Watford. . . . . £441 0 0  
H. W. Bonner, Harrow. . . . . 385 0 0  
G. & J. Waterman, Watford. . . . . 368 0 0  
\* Accepted.

**HORNSEY.**—For making up Waverley, Christ Church, and Cecil Park roads, and securing Alexandra-place.

|                           | A.                     | B.     | C.     | D.  |
|---------------------------|------------------------|--------|--------|-----|
| Victoria Stone Co.        | 1,182                  | —      | —      | —   |
| Rogers & Co., W.          | 1,168                  | —      | —      | —   |
| Killingbeck, Camden Town  | 1,408                  | 1,297  | 90     | —   |
| Jackson John, Enfield     | —                      | 1,400  | 1,125  | 50* |
| Adams, T., Kingland       | —                      | 1,327  | 1,176  | 76  |
| Ball, Tottenham           | —                      | 1,301  | 1,019  | 61  |
| Walker A., Holloway       | —                      | —      | 1,195  | 92  |
| Pizzov, Hornsey           | —                      | —      | 1,167  | 85  |
| Aspinall & Son, Finsbury  | —                      | —      | —      | —   |
| Moslem & Co., Westminster | 1,005                  | 1,336  | 1,193  | 114 |
| Dunmore, Crouch End       | 933*                   | 1,329  | 1,081* | 68  |
| * Accepted.               | —                      | 1,322* | 1,190  | 141 |
| A. Waverley-road.         | B. Christ Church-road. |        |        |     |
| C. Cecil Park.            | D. Alexandra-place.    |        |        |     |

**KINGSTON-ON-THAMES.**—For the erection of St. Luke's Church, Kingston-on-Thames. Messrs. Kelly & Birchall, architects, Queen Anne's-gate, Westminster, S.W.

|                          | No. 1 Contract. | No. 2 Contract. |
|--------------------------|-----------------|-----------------|
| Wheeler. . . . .         | £4,800 10 0     | £2,420 0 0      |
| Oldridge & Sons. . . . . | 4,288 0 0       | 1,819 0 0       |
| D. Judd. . . . .         | 3,677 10 0      | 1,815 0 0       |
| W. H. Gaze. . . . .      | 3,695 0 0       | 1,684 0 0       |
| * Accepted.              |                 |                 |

**LEICESTER.**—For the erection of new Board Schools at Aylestone, near Leicester. Messrs. Roberts & Gordon, architects, Welford-place, Leicester.

Stevens. . . . . £6,210 0 0  
Duckbury & Son. . . . . 6,187 0 0  
Jewsbury. . . . . 6,119 0 0  
J. C. Kallet & Son. . . . . 6,038 0 0  
T. & H. Herbert. . . . . 5,860 0 0  
H. Bland. . . . . 5,830 0 0  
T. Bland. . . . . 5,830 0 0  
Hutchinson & Son. . . . . 5,825 0 0  
Longden & Son. . . . . 5,780 0 0  
H. Bland. . . . . 5,770 0 0  
Clark & Garrett. . . . . 5,709 0 0  
W. H. Kallet. . . . . 5,597 0 0  
Hewitt (accepted). . . . . 5,320 0 0

**LEIGH.**—For heating apparatus at the fitting and drying sheds at Messrs. Harrison, McGregor, & Co.'s Works, Leigh. Mr. J. C. Prestwich, architect, Leigh.

John Grundy, London (accepted). . . . . £155 0 0

**LONDON.**—For the transfer of the three iron buildings on the Marsh-lane site (Greenwich E2) to the site in Ederon-road, Rotherhithe New-road, for the School Board for London. Mr. T. J. Bailey, architect.

|                         |           |
|-------------------------|-----------|
| Young & Podger. . . . . | £496 10 0 |
| G. B. Ash. . . . .      | 480 0 0   |
| J. J. Lee. . . . .      | 433 0 0   |
| F. P. Smith. . . . .    | 429 0 0   |
| T. H. Goodsell. . . . . | 407 16 6  |
| A. Martin. . . . .      | 400 0 0   |
| A. Cook. . . . .        | 335 0 0   |
| North & Son. . . . .    | 300 0 0   |
| H. J. Williams. . . . . | 215 0 0   |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For providing new boilers and extending the present warming apparatus at the undernethered schools, for the School Board for London. Mr. T. J. Bailey, architect.

|                                   |          |
|-----------------------------------|----------|
| W. G. Cannon. . . . .             | £253 0 0 |
| J. & F. May. . . . .              | 380 0 0  |
| C. P. Kinnell & Co. . . . .       | 285 0 0  |
| Hayward Bros. & Eckstein. . . . . | 280 0 0  |
| T. Green & Son. . . . .           | 233 0 0  |

|                             |          |
|-----------------------------|----------|
| W. G. Cannon. . . . .       | £233 0 0 |
| C. P. Kinnell & Co. . . . . | 245 0 0  |

|                             |          |
|-----------------------------|----------|
| W. G. Cannon. . . . .       | £239 0 0 |
| W. Summings & Sons. . . . . | 175 0 0  |
| T. Green & Son. . . . .     | 165 0 0  |

|                         |          |
|-------------------------|----------|
| W. G. Cannon. . . . .   | £173 0 0 |
| T. Green & Son. . . . . | 150 0 0  |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For the warming of the Purcell-road school (Greenwich E1) on the low-pressure hot-water system, for the School Board for London. Mr. T. J. Bailey, architect.

|                       |          |
|-----------------------|----------|
| W. G. Cannon. . . . . | £338 0 0 |
| J. & F. May. . . . .  | 310 0 0  |
| J. Jeffreys. . . . .  | 395 0 0  |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For warming the pupil teachers' department of the William-street School (Chelsea T), for the School Board for London. Mr. T. J. Bailey, architect.

C. P. Kinnell. . . . . £200 0 0  
W. G. Cannon. . . . . 187 0 0  
Price, Lea, & Co. . . . . 184 0 0  
W. & F. May. . . . . 177 0 0  
Hayward Bros. . . . . 135 10 2  
Rover & Russell. . . . . 131 0 0

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For the enlargement of the Dalgleish-street School, Limehouse (Tower Hamlets S1) by 200 places, for the School Board for London. Mr. T. J. Bailey, architect.

|                           |            |
|---------------------------|------------|
| Albion & Latta. . . . .   | £2,750 0 0 |
| J. Godfrey & Son. . . . . | 2,247 0 0  |

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For the erection of a cookery centre on the Ackmar-road site (Chelsea Q1), for the School Board for London. Mr. T. J. Bailey, architect.

F. P. Tunks. . . . . £318 0 0  
T. Linfield. . . . . 480 0 0  
Simmonds Bros. . . . . 447 0 0  
A. Brinkell. . . . . 434 0 0

\* Recommended by the Works Committee for acceptance.

**LONDON.**—For completing Nos. 79, 83, and 85, Brondesbury-villas, Kilburn, N.W., under the superintendence of Mr. Wm. Eves, 10, Union-court, Old Broad-street, E.C. —

|                                  | No. 79.         | No. 83.         | No. 85.         |
|----------------------------------|-----------------|-----------------|-----------------|
| Spencer & Co. . . . .            | £ s. d. 613 5 8 | £ s. d. 613 0 0 | £ s. d. 613 0 0 |
| Schatten & Co. . . . .           | 578 0 0         | 575 0 0         | 574 0 0         |
| G. Gudson. . . . .               | 560 0 0         | 530 0 0         | 530 0 0         |
| G. Payne. . . . .                | 521 0 0         | 524 0 0         | 515 0 0         |
| J. Munday. . . . .               | 520 0 0         | 520 0 0         | 521 0 0         |
| H. W. Sall. . . . .              | 516 0 0         | 515 0 0         | 515 0 0         |
| E. Good. . . . .                 | 480 0 0         | 480 0 0         | 480 0 0         |
| G. A. Rowley. . . . .            | 470 0 0         | 470 0 0         | 470 0 0         |
| W. Fout. . . . .                 | 460 0 0         | 460 0 0         | 460 0 0         |
| H. W. Dunmore. . . . .           | 458 0 0         | 458 0 0         | 458 0 0         |
| R. Cox. . . . .                  | 445 0 0         | 445 0 0         | 445 0 0         |
| J. Furdham. . . . .              | 430 0 0         | 430 0 0         | 430 0 0         |
| C. J. Barrell. . . . .           | 396 0 0         | 396 0 0         | 396 0 0         |
| F. J. Wickes. . . . .            | 393 0 0         | 393 0 0         | 393 0 0         |
| J. Tillbrook. . . . .            | 385 0 0         | 375 0 0         | 380 0 0         |
| G. Flaxman, 87, Southgate-rd. N. | 365 0 0*        | 365 0 0*        | 365 0 0         |
| Woodhouse. . . . .               | 355 0 0         | 355 0 0         | 355 0 0         |

\* Accepted.

**LONDON.**—For proposed new works in the erection of the Randolph Mansions, on the north-east side of Portsdown-road, Maida Vale. Messrs. New & Son, architects.

Quantities supplied:—

Longmore & Burge, Gray's Inn-road £16,360 0 0  
Mark, Eglar-road. . . . . 1,360 0 0  
John Burdall, 2, Braden-street. . . . . 1,245 0 0  
Oldrey, Kensal-green. . . . . 15,000 0 0  
Halliday & Greenwood, Battersea. . . . . 14,730 0 0  
Tennant, Willesden. . . . . 14,451 0 0

**LONDON.**—For the erection of Ah-ho-ho-ho Warls and Workrooms for Women at the Workhouses in Northumberland-street, Marylebone, for the Guardians in Northumberland-street, Marylebone. Messrs. H. Saxon Powell & Son, architects, London.

Patman & Fotheringham. . . . . £11,249 0 0  
Ward, Clarke, & Co. . . . . 11,116 0 0  
E. Toms. . . . . 11,047 0 0  
Kirk & Randall. . . . . 10,913 0 0  
Mowlen & Co. . . . . 10,895 0 0  
J. T. Chappell. . . . . 10,880 0 0  
Longley, Crawley. . . . . 10,574 0 0  
W. B. Brown (accepted). . . . . 1,139 0 0

**LONDON.**—For alterations, new roofing, and decorative repairs to No. 3, Milton-buildings, Watling-street, London, E.C. Mr. H. Huntly-Gordon, architect and surveyor, 26, Craven-street, Charing-cross, London, W.C.

Colley, B. . . . . £550 0 0  
\* Accepted subject to alterations.

**LONDON.**—For proposed additions and alterations to St. James' Club, Piccadilly. Mr. E. R. Robson, F.S.A., architect. Quantities supplied by Messrs. W. H. Barber & Son.

|                      |            |
|----------------------|------------|
| Higgs & Hill .....   | £3,820 0 0 |
| Trollope & Son ..... | 6,059 0 0  |
| Mowlem & Co. ....    | 5,945 0 0  |
| Holland & Hannen ..  | 5,737 0 0  |
| Peto Bros. ....      | 5,833 0 0  |
| Bywaters .....       | 5,584 0 0  |
| Jerrard .....        | 5,673 0 0  |
| Perry & Co. ....     | 5,562 0 0  |

**LONDON.**—For a new staircase and alterations to Nos. 6 & 7, Noble-street, Lilypot-lane, E.C. Mr. H. Hantly-Gordon, architect and surveyor, 26, Craven-street, London, W.C.

|                     |          |
|---------------------|----------|
| Kirby & Chase ..... | £169 0 0 |
| R. Eddle .....      | 137 0 0  |

**LONDON.**—For rebuilding No. 352, Mile End-road, for Mr. E. R. Goodrich. Mr. C. A. Legg, architect, Mr. W. Hawker, surveyor.

|                     |            |
|---------------------|------------|
| Wood .....          | £1,280 0 0 |
| Salt .....          | 1,247 0 0  |
| Calman .....        | 1,233 0 0  |
| Nicolls .....       | 1,218 0 0  |
| Keen .....          | 1,170 0 0  |
| Hawkins .....       | 1,167 0 0  |
| Cousell .....       | 1,092 0 0  |
| George Lusk .....   | 1,033 0 0  |
| Wyand (accepted) .. | 993 0 0    |

**LONDON.**—For repairs to shop and premises, Tottenham Court-road, London, for Mr. R. Reid, architect, Great Marlborough-street.

|                            |           |
|----------------------------|-----------|
| Conway .....               | £147 10 0 |
| Styles & Son .....         | 150 0 0   |
| Clarke & Mannoch ..        | 149 0 0   |
| A. B. Clarke (accepted) .. | 139 10 0  |

**MANCHESTER.**—For the erection of a house at Heaton-Mersey, near Manchester, for Mr. J. H. L. Seaborn. Mr. J. D. Harker, architect, 75, King-street, Manchester.

|                                    |            |
|------------------------------------|------------|
| Wm. Southern & Sons, Manchester .. | £1,720 0 0 |
| Froggatt & Briggs, Stockport ..... | 1,699 0 0  |
| T. & H. Meadows, Stockport .....   | 1,683 0 0  |
| Butters & Owsen, Manchester .....  | 1,645 0 0  |
| Burgess & Galt, Manchester .....   | 1,633 0 0  |
| J. Davison, Manchester .....       | 1,630 0 0  |
| Wm. Shaw, Manchester .....         | 1,599 0 0  |
| Edward Wood, Manchester* ..        | 1,570 0 0  |

**PLYMOUTH.**—For erecting the Spanish Armada Memorial, on the Hoe at Plymouth, from the designs of Mr. Herbert A. Gribble, architect, 10, Sydney-street, South Kensington.

|                                  |            |
|----------------------------------|------------|
| Farmer & Brindley, London .....  | £1,030 0 0 |
| Roach, Plymouth .....            | 1,030 0 0  |
| Goad, Plymouth .....             | 978 0 0    |
| Whitehead & Sons, Aberdeen ..... | 955 0 0    |
| Storcy, Gunnislake (accepted) .. | 895 0 0    |

**SANDOWN (I.W.).**—For the erection of a Sea-wall and formation of an Esplanade, with shipways, for the Sandown Local Board. Mr. James Newman, engineer.

|                                     |            |
|-------------------------------------|------------|
| J. Bell, Son, & Co., Southampton .. | £2,638 0 0 |
| —, Ditch, at Helen's .....          | 2,425 0 0  |
| J. Meader, Ryde .....               | 2,395 0 0  |
| —, Ball & Son, Cowes .....          | 2,223 10 0 |
| John Tate, Fareham .....            | 2,201 0 0  |
| George Hayles, Shanklin .....       | 2,026 0 0  |
| Francis Lyle, Taverham .....        | 1,997 0 0  |
| Isaac Barton, Ryde (accepted) ..    | 1,769 0 0  |

**SHERBORNE.**—For heating apparatus (warm air), Sherborne Abbey Church. Messrs. Carpenter & Ingelow, architects, London.

|                                   |          |
|-----------------------------------|----------|
| John Grundy, London (accepted) .. | £275 0 0 |
|-----------------------------------|----------|

**STANSTEAD.**—For heating apparatus at Stanstead Parish Church. Mr. W. D. Caroe, architect, London.

|                                   |          |
|-----------------------------------|----------|
| John Grundy, London (accepted) .. | £100 0 0 |
|-----------------------------------|----------|

**STRATFORD.**—For new stables for Messrs. C. Boardman & Sons, Stratford. Mr. George Baines, architect, 4, Great Winchester-street, E.C.

|                                |            |
|--------------------------------|------------|
| North Bros. ....               | £1,017 0 0 |
| S. J. Scott .....              | 975 0 0    |
| Mark Gentry .....              | 960 0 0    |
| R. G. Battley .....            | 973 0 0    |
| J. Goffrey & Son .....         | 818 0 0    |
| F. & H. F. Higgs .....         | 810 0 0    |
| F. J. Corbush, Leytonstone* .. | 759 0 0    |

\* Accepted.

**SWANSEA.**—For the erection of two detached villa residences on the Coed-seon Estate, Sketty, near Swansea. Mr. J. Buckley Wilson and Mr. Glendinning Moxham, architects to the estate.

|                |            |
|----------------|------------|
| J. Gwynn ..... | £280 each. |
|----------------|------------|

**SWANSEA.**—For the erection of shop, Wind-street, Swansea. Mr. J. Buckley Wilson, architect. Quantities by Mr. Glendinning Moxham.

|                                |      |
|--------------------------------|------|
| Thomas Watkins & Jenkins ..... | £280 |
|--------------------------------|------|

**SWANSEA.**—For additions to residence, Walter's-road, Swansea. Mr. J. Buckley Wilson, architect. Quantities by Mr. Glendinning Moxham.

|                                |      |
|--------------------------------|------|
| Thomas Watkins & Jenkins ..... | £710 |
|--------------------------------|------|

**WATFORD.**—For new chimney shaft, &c., at the Cannon Brewery, for Messrs. Benkin & Co. Mr. C. P. Ayres, architect, Watford.

|                                      |          |
|--------------------------------------|----------|
| G. & J. Waterman, Watford .....      | £874 0 0 |
| Thomas Turner, Limited (accepted) .. | 846 0 0  |

**WOKING.**—For heating apparatus, Woking Parish Church. Mr. W. F. Unsworth, architect, Westminster.

|                                   |          |
|-----------------------------------|----------|
| John Grundy, London (accepted) .. | £160 0 0 |
|-----------------------------------|----------|

**WOODFORD.**—For heating apparatus at new residence at Woodford, for Mr. Mason. Messrs. Spalding & Auld, architects, London.

|                                   |          |
|-----------------------------------|----------|
| John Grundy, London (accepted) .. | £100 0 0 |
|-----------------------------------|----------|

**WOOLWICH.**—For rebuilding Nos. 34 and 35, Powis-street. Mr. Henry H. Church, Woolwich, architect.

|                         |            |
|-------------------------|------------|
| Barham, Greenwich ..... | £1,300 0 0 |
| Martin, Greenwich ..... | 850 0 0    |
| Johnson, Woolwich ..... | 790 0 0    |
| Coombs, Plumstead ..... | 630 0 0    |
| Civil, Woolwich .....   | 625 0 0    |

**WOOLWICH.**—For alterations and additions at No. 101, Powis-street, Woolwich. Mr. Henry H. Church, Woolwich, architect.

|                                    |          |
|------------------------------------|----------|
| Bradley, Islington .....           | £430 0 0 |
| Gould & Brand, Camden-town .....   | 385 0 0  |
| Coombs, Plumstead .....            | 275 0 0  |
| Civil, Woolwich .....              | 275 0 0  |
| Francis & Co., for brass shades .. | 50 12 0  |

**WOOLWICH.**—For rebuilding four houses in Thomas-street. Mr. Henry H. Church, architect, Woolwich.

|                         |            |
|-------------------------|------------|
| Coombs (accepted) ..... | £1,000 0 0 |
|-------------------------|------------|

**WOOLWICH.**—For building two houses in Upper Market-street. Mr. Henry H. Church, architect, Woolwich.

|                         |          |
|-------------------------|----------|
| Coombs (accepted) ..... | £200 0 0 |
|-------------------------|----------|

**WOOLWICH.**—For alterations and additions at No. 82, Wellington-street. Mr. Henry H. Church, Woolwich, architect.

|                         |          |
|-------------------------|----------|
| Coombs (accepted) ..... | £230 0 0 |
|-------------------------|----------|

**WOOLWICH.**—For rebuilding shops, No. 42 and 43, Hare-street, for Mr. Squires. Mr. Henry H. Church, Woolwich, architect.

|                                   |          |
|-----------------------------------|----------|
| Coombs, Plumstead .....           | 2320 0 0 |
| Pitchford, Plumstead .....        | 810 0 0  |
| Longman Brothers, Plumstead ..... | 785 0 0  |
| Civil, Woolwich (accepted) .....  | 700 0 0  |

**WOOLWICH.**—For rebuilding shops, No. 117, 118, and 119, High-street, for Messrs. Paine. Second estimate.

|                                             |            |
|---------------------------------------------|------------|
| Mr. Henry H. Church, Woolwich, architect .. | £3,060 0 0 |
| Longman Brothers, Plumstead .....           | 2,890 0 0  |
| Coombs, Plumstead .....                     | 2,875 0 0  |
| Civil, Woolwich .....                       | 2,672 0 0  |

**TO CORRESPONDENTS.**

J. R. R. (your letter is merely an advertisement)—J. R. R. O. B. (not to the point)—J. S. (amount should be sent)—I. P. we do not see an architect is to blame for exercising his independent judgment about such an advertisement, most architects would probably not trust in themselves about the matter, and would say, "I know best about that." But we think the architect should have informed himself by special evaluation about the quality of the architect proposed to be substituted, instead of trusting to the contractor's assurance.—B. C. & Co. (should send amount)—Lots of tenders received too late from D. & C. M. S. and E. L. B.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, and necessary for publication. We are compelled to decline pointing out books and giving addresses.

**NOTE.**—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

**Be careful underwriters to return rejected communications.**

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# The Builder.

VOL. LV. No. 2386

SATURDAY, OCTOBER 27, 1895.

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### A Tour in the Weldon Stone District.



On Friday, the 19th inst., a large party of guests, including several well-known architects, accepted an invitation from the Earl of Winchelsea and Nottingham to visit the Weldon stone quarries and some of the ancient houses built from the stone from these quarries, notably Kirby Hall, once the home of the Winchelsea family. It was in brilliant sunshine that the Earl stood in the grass-grown court of the beautiful house wherein his predecessor was born, and received his guests assembled from all parts of England. As the sunshine fell on the mossy walls, and lit up the delicate carving, which centuries of existence and half a century of neglect have hardly impaired, it was impossible to repress a feeling of sadness that so fair a house should have been abandoned to decay. And yet, when the difference between the habits of these days and those of the time when John Thorpe laid the first stone is considered, one can hardly wonder that a place so remote and so inconvenient should have been deserted for more cheerful, more commodious, and more accessible homes. It is little more than fifty years since the family finally left Kirby to itself, but in that time destruction has been wrought that only princely fortune can repair. Restoration, as Lord Winchelsea said, is at present out of the question, but preservation fortunately is not; and it will give pleasure to all who know Kirby Hall to learn that means have already been taken to prevent further decay, and that "Time's fell hand" is to be stayed in its work of defacement.

Of all the mansions of England, Kirby, perhaps, offers the greatest variety of stately grouping and beautiful detail. Here may be seen, in a more striking manner than anywhere else, the meeting of the Early and the Late Renaissance, the work of John Thorpe and of Inigo Jones side by side. Being so fine a place as it is, it is curious to find so few references to Kirby in the usual sources of information on notable buildings.

Bridges mentions it in his "History of Northamptonshire" at the beginning of the eighteenth century; but Norden, in his "Delineation" of the county, published in the

early years of the seventeenth century, does not say a word about it, although his little book is dedicated to Sir William Hatton, who owned Kirby at the time, and he, moreover, gives a list of the principal seats in the county, many of which were far inferior to Kirby in point of importance.

We do get a reference from Evelyn, who visited the place on Aug. 25, 1654, and writes: "I went to see Kirby, a very noble house of my Lord Hatton's in Northamptonshire, built *à la moderne*, the garden and stables agreeable, but the avenue was ungraceful and the seats naked." But Walpole, who went everywhere, has nothing to say of Kirby, and we sadly miss the continuous references which do so much to enliven the history of most of the notable houses of the country.

One very important record, however, we have—in the shape of the preliminary plans made by John Thorpe, on one of which he has written, "Kerby wherof I layd y<sup>e</sup> first stone A<sup>d</sup> 1570." It has frequently been stated by those who have not investigated the subject that there is some doubt whether this is the Kirby referred to, or whether it was not a Kirby Castle, in Middlesex, now completely destroyed. It is only necessary to compare these plans with the building itself to see that they represent the Northamptonshire Kirby, but not exactly as we see it now. They are like it in the main, but with certain obvious differences which preclude the supposition either that they were the plans from which it was actually built, or that they were made from a survey after it was finished. Most likely they are preliminary sketches, for the ground and upper plans do not even exactly agree with each other. An examination of them with the building seems to point to its having been built at three periods. First, there is the beginning of the work in 1570, a date confirmed by various inscriptions on the building itself, all of them on the west front of the courtyard, where the dates 1572, 1575 occur on the parapet and over the porch. Here also is the name HVM—FRE STA—FARD, and the motto, "Je serai loyal." The Stafford crest, a boar's head rising out of a ducal coronet, may be seen, together with the Stafford knot and other devices of the family, all round the main courtyard on the parapet, from which we may conclude that the whole of the courtyard was built by the Staffords between 1570 and 1575. And we gather that it was rendered habitable inside by them, since their devices, carved in oak, adorned the ceilings of some of the rooms.

But only seven years after the laying of the first stone it had already passed from the Staffords to Sir Christopher Hatton, the celebrated Lord Chancellor before whom the seals and maces danced; and in the year 1580 Sir Christopher wrote to Sir Thomas Heneage that he was going to take his way to Sir Ed. Brudnell's to view his house of Kirby, which he had never yet surveyed.

The house, therefore, did not long remain in the hands of the first builder.

The second period of building seems to have occurred in 1590, just before Lord Chancellor Hatton died. We know that the stables (now completely gone) bore the date 1590; and an examination of the house shows that the character of the masonry differs in certain places, notably in the wings projecting on the south-west face. The general detail is still Elizabethan, but the treatment of the quoinstones is perceptibly different from those in the older work. Thorpe indicates such alterations on his plans, and we may conclude that Sir Christopher employed him to enlarge the house which he had designed for Sir Humphrey Stafford twenty years before.

The third period is ascertained by the dates on the building, 1638 and 1640, when various windows were inserted under the superintendence of Inigo Jones, who also remodelled the north-west or entrance front. It must not be supposed that he built the whole of this north-west front entirely anew, for the arcade is shown on Thorpe's drawing, and the Stafford badges occur all along it, thus showing that the bulk of it belongs to the earliest period. The work done at the third period may also be distinguished by the presence of the Hatton arms, the three garbs.

Subsequently to Inigo Jones there was a great deal of woodwork put up throughout the house; but the external appearance of the place indicates, as already said, in a striking degree, the meeting of the two phases of Renaissance architecture—the early under John Thorpe, and the late under Inigo Jones.

After a luncheon in the great hall, which for many a long year had not witnessed such a gathering, presided over by the head of the house, the party moved on to the quarries, where the qualities of the stone were fully investigated. To judge from the extent of the irregular mounds and hollows which adjoin the village, Weldon must once have been the centre of a large stone industry, but during last century the demand lessened, the great lines of transport left the place at a distance, and the quarries were almost deserted.

They were worked enough to keep alive the knowledge of the stone, but large orders were impossible, for no means existed to fulfil them. Now, however, that a new railway runs within two miles of the quarry, the stone can be delivered in plenty on the rails at rates which render it able to compete in any market. The stone itself (*exporto crade*) is a pleasant one to use. It works easily, but acquires a very hard face by exposure. Its colour is pleasant to begin with, and in course of time the kindly lichens cover it with a beautiful coating of grey and gold, such as may be seen in perfection on the Triangular Lodge at Rushton.

There appear to be four beds of stone, which occur in ascending order, as follows:—

1. "Ragstone," varying from 2 ft. to 6 ft. or more in thickness, used for steps, flooring, walling, &c. 2. "A bed," principally employed for ashlar. 3. "A' bed," quarried for ashlar and mouldings, carvings, &c. This is considered to be the best quality stone. 4. "B bed," worked for ashlar.

The thicknesses of the beds 2, 3, and 4 are extremely variable, and they are not usually all met with in one quarry. The average total thickness of the three may be taken as about 18 ft. A remarkable feature is the size of the stones as they lie on the flat. On entering the principal quarry we measured one 9 ft. by 3 ft. by 4 ft., but soon found that this was only a small specimen of what could be obtained. After the rough ragstone is removed, the blocks are sawn *in situ*, the saws being aided in the operation by water. Some of the blocks, however, are small enough to be forced out by steel wedges in the ordinary way. About thirty men are employed in the two quarries now open.

We will now proceed to describe the stones in detail. They are found in the geological formation known as the "Lincolnshire Oolite," which is also extensively worked at Ketton, Clipsham, Stamford, Casterton, Wansford, &c. All the four beds found at Weldon are limestones, distinctly oolitic in structure. Under the microscope, thin sections show that they are made up of little egg-shaped or ovoid grains, upon the size of which the grain of the rock almost entirely depends. These little ovoid bodies are worthy of particular notice. We have frequently, of course, observed them in other limestones of a similar character to that of Weldon, but the structure is so admirably developed in beds 2, 3, and 4, that it materially assists us in judging of the durability of the stone. These minute spherules are made up of carbonate of lime, and the microscope shows that in each grain the lime is arranged in layers, concentrically disposed, like the successive coats of an onion, usually having some object in the centre, such as a fragment of shell or other foreign matter. Very minute lines radiate from the centre to the circumference of the body. These spherules are believed to have been formed in water saturated with carbonate of lime, the fragment of shell or sand now seen in the centre having acted as a nucleus around which the carbonate of lime was deposited while the grain was rolling gently about on the bottom of the sea. It would appear, however, that this oolitic structure is sometimes produced by other causes. In addition to the egg-shaped grains being of variable size in the different kinds of Weldon stone, innumerable fragments of shells occur, especially in bed A and the ragstone. The microscope shows that this shelly matter is crystalline calcite. So far we have only analysed the nature of the particles composing the stone, and we find that in all four examples oolitic grains occur, the bed A being made almost wholly of them, whilst the ragstone and bed A are mixed with a considerable proportion of shelly matter, bed B being an intermediate variety between the two kinds. The two last-mentioned varieties have small cavities pitted over them which are not due to the weathering-out of shell-particles, as is commonly the case with oolites, but are merely the insides of shells which have either never been filled with anything, or the mineral which occupied them has been removed by the action of solvents. In dealing with durability, this is important to

remember, because, if the shelly matter itself had been removed and the cavities were due to this, the whole stability of the stone would be affected, and it would soon manifest itself by general decay. But it is evident that oolitic grains and shell-fragments cannot of themselves form a compact stone, any more than can grains of loose quartz sand make a sandstone; something is required to cause them to adhere to each other. Nothing but the microscope can possibly determine the nature of the cementing material, and it will easily be understood that the compactness and durability of the stone also largely depend upon the character of this cement. In the Weldon stone we find that in all the varieties it is calcite; but whereas in beds A, A', and B this mineral is amorphous, or, in a measure, only sub-crystalline in its disposition between the grains, and does not wholly fill up the interstices between the particles, in the ragstone the calcite is crystalline, filling up every little space, and rendering the stone so compact that it can be polished. Indeed, many of the marble slabs and chimney-pieces in some of the principal houses in Northamptonshire are made of polished ragstone. It is interesting also from a commercial point of view to note that the bed A', if not the other two beds also, occasionally contain hard concretions, which seem to have been formed by the calcite becoming more concentrated and crystalline at such points. We need hardly mention that these concretions do not detract from the durability, though they must add somewhat to the cost of working the stone. Neither are they sufficiently numerous to deserve more than a passing notice. Speaking generally, the fragments of the three free-stone beds are cemented together by just enough calcite, of a sub-crystalline texture, to render them easily worked. The colour of the beds is light cream, but streaks of light blue also are everywhere seen in the ragstone.

We have not seen a chemical analysis of the Weldon stone, but from our microscopical analysis we should think, taking the best bed A', as a type, that it contains about 93·5 per cent. of carbonate of lime, 3 carbonate of magnesia, 7·5 iron and alumina, and a slight trace of bitumen, the rest being water and loss. Its crushing weight, as tested by Messrs. Kirkaldy & Son, is 140·3 tons per square foot. About 16 ft. of Weldon stone go to a ton.

A description of a stone conveys but little information unless it is comparative; and only stones of similar character should fairly be compared, except the comparison embraces a general view of the different classes of stone. The Weldon stone being an oolite, we shall compare it with other oolites from different parts of the country. The following table is derived from various sources, but principally from the "Report on the Selection of Stone for building the New Houses of Parliament":—

Examining the table, we notice that Ancaster, Ketton, and Barnack stones, found in the same district as the Weldon, contain no silica. We failed by the aid of the microscope to detect any also in the last-mentioned stone. On the contrary, the Chilmark stone contains a very considerable proportion of silica, much of which, however, does not affect its durability either one way or another being largely present as nuclei of the oolitic spherules. We mention this, because some people think that to get a high percentage of silica in a limestone is a good criterion of its superior durability. Our readers will understand, therefore, how little a chemical analysis can assist in determining the durability of stone in this respect; it is unable to state how the silica is disseminated throughout the stone. Another item to be noticed is that chemical analysis cannot determine the kind or degree of crystallisation of the carbonate of lime, so that the analysis of a crystalline calcite shell, which is hardly affected by the country atmosphere, is identical with that of an arragonite shell, which is easily weathered, causing the stone to break up. The chemical composition of calcite and arragonite is identical, but the microscope determines the difference between the two. The shells of the Weldon stone are barely affected by country air, stand out when the matrix is weathered, whilst the majority of the Bath stone shells—all that we have examined—are made of the less crystalline form of the mineral. Many other interesting points of comparison could be raised, but this is hardly necessary in the present instance.

During the day we very closely noted the effects of the atmosphere on the stones of the buildings visited. It is assumed that the edifices were all made largely of Weldon stone, but as stone of similar nature is found in the district, this is not absolutely proved, although from the extent of the ancient Weldon workings, it is most probably the case. There is very little doubt, however, that Kirby Hall is built of it. We recognise at least three of the four worked beds in various parts of the building. The stones form the large pilasters, fluting, and rich capitals were, generally speaking, in most excellent condition; the mouldings and the bands carving, flowers, with the Stafford knot at Hatton crest, conspicuously seen round the quadrangle, are also almost as sharply defined as on the day they were cut. There are a few flaws in the masonry of the more exposed parts on the top of the building; but some of the rich carving, especially at the base of the two pilasters on either side of the main entrance, inside the quadrangle, is not in so good condition. One of the outer entablatures is not in a very good state of preservation. That part of the building made of ragstone is in good order. Speaking generally it is remarkable that, after the lapse of the

| Name of Stone. | Carbonate of Lime. | Carbonate of Magnesia. | Silica. | Iron and Alumina. | Water and Loss. | Eluene. | Specific Gravity. | Colour.               | Remarks.                                                                                                                       |
|----------------|--------------------|------------------------|---------|-------------------|-----------------|---------|-------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Weldon ...     | 93·5               | 3·00                   | 0·03    | 0·75              | 2·75            | a trace | 2·85              | Cream and light brown | Medium and small oolitic grains cemented by sub-crystalline calcite, crystalline in concentration. Closely laminated in parts. |
| Ancaster ....  | 93·5               | 2·90                   | 0·00    | 0·50              | 2·71            | a trace | 2·182             | Ditto.                | Small oolitic grains, cemented by sub-crystalline, or crystalline calcite.                                                     |
| Ketton ..      | 92·17              | 4·10                   | 0·00    | 0·91              | 2·83            | a trace | 2·045             | Heavy cream           | Medium oolitic grains, few shells cemented by sub-crystalline calcite.                                                         |
| Barnack ..     | 93·40              | 3·80                   | 0·00    | 1·30              | 1·50            | a trace | 2·000             | Very light brown      | Coarse, roughly laminated, shell oolite, sub-crystalline calcite cement.                                                       |
| Bath Box ...   | 94·52              | 2·50                   | 0·00    | 1·20              | 1·78            | a trace | 1·830             | Cream                 | Fine oolitic grains, with shell fragments, cemented by earthy carbonate of lime.                                               |
| Douling ..     | 85·89              | 0·11                   | 2·04    | 1·61              | 0·32            | —       | 2·430             | Light brown           | Very compact, oolitic grains some with quartz-sand nuclei, and small shell fragments, with a calcareo-siliceous cement.        |
| Portland ..    | 97·16              | 1·20                   | 1·20    | 0·80              | 1·94            | a trace | 2·145             | Whitish brown         | Oolitic grains, many with quartz-sand nuclei, cemented by crystalline rhombate of lime.                                        |
| Chilmark ....  | 79·00              | 3·70                   | 10·10   | 2·00              | 4·20            | a trace | 2·451             | Light greenish brown  | Oolitic grains with quartz-sand nuclei, cemented partly by sub-crystalline calcite, and partly by amorphous silica.            |

All the stones referred to in the foregoing table are fair average specimens of the best quality.



hundred years, the stone of a great portion of the mansion is in such an excellent condition. Much of it is covered with lichens.

In the villages passed through, the angles of buildings were noticed by everybody to be very sharp and clean. The stone of Gedding-ton Cross, also visited, was found to be in fair condition. The cross has lost its crowning pinnacle, and the crocketed heads of the highest remaining stage are somewhat insecure, but, except for this and for a certain amount of wear round the lowest stage, against which many generations of children have rubbed, the structure has come down to us untouched from the thirteenth century. It is triangular on plan, each side being slightly bowed out in the middle. The base, or shaft, is covered with spirited diaper-work of various designs; above this are three canopied niches, in each of which stands a figure of the queen, clad in grave and simple drapery; above the niches the structure gradually tapers upwards in stages, still preserving the triangular arrangement of its plan. It is a curious and striking monument, and, standing as it does in the middle of an open space at the meeting of three roads, it shows itself to great advantage.

At Rushton Hall it was noticed that the stone in the base of the building was, in some parts, in a very advanced state of decomposition; but we are decidedly of opinion that the decayed stone did not come from Weldon. It is much larger grained than any of the beds at the latter place, and when closely examined has a very different appearance. The upper portions of the house were in a much better state of preservation. From what could be seen, and from our examination, we should think that Weldon stone is a very good material for country buildings; and even in the atmosphere of London there is no reason why it should not be found to be as serviceable as any of the better classes of limestones, though none of these latter, as we have frequently had occasion to remark, are particularly noted for being durable in our smoke-begrimed Metropolis.

The sun was already touching the earth as the party drove up to the beautiful façade of the Hall. There was just time, however, to walk up through the long shrubbery, past the walk where Dryden paced when musing over the "Hind and Panther," past an open summer-house, whence (an inscription tells us) the "straining eye" is able to see the field of Naseby; and so on to the Triangular Lodge. It is a curious building, this lodge, covered with all manner of devices, some heraldic, some religious, some unintelligibly mystic, all set amid architectural details of great character and originality, but the sight of which might be expected to entail syncope on the purist. Amid the many legends that attach to this quaint building may be mentioned one which attributes the excellence of its masonry to the fact that the mortar was mixed with beer!

Rushton Hall is one of the best examples of Elizabethan architecture which remain to us. It is built round three sides of a court, across the fourth side of which stretches a one-storied corridor. The effect of this arrangement in approaching the house is very happy, as the long and low corridor permits a view of the receding wings, whereof the straight lines of the parapets are broken by little gables at intervals. The details, moreover, are all simple and rational; there is nothing forced nor bizarre; the whole effect is obtained by a judicious withholding of the hand.

Rushton was for several centuries the home of the elder branch of the Tresham family. To one of them we owe the earliest parts of the house, of which the great hall and its circular bay, as well as much more of the two lower stories, date from the fifteenth century. In course of time arose the greatest builder of the race, Sir Thomas Tresham, who not only has left us three separate buildings, each full of interest, namely, the Triangular Lodge, Rothwell Market House, and Lyveden New Building, but also a considerable part of Rushton Hall, which he greatly enlarged. His work is adorned, as usual, with the date

(1595), and the trefoil of the Treshams, the "foliis languentibus herba," as one of the race calls it in his epitaph. Close to it, and in gables of similar detail, occurs a wholly different coat-of-arms, under the dates 1618, 1626, and others. The new arms are those of the Cockaynes, and in the juxtaposition of the two coats is involved one of the best-known events of English history. For the eldest son of Sir Thomas was Francis Tresham, whose letter to his brother-in-law, Lord Mounteagle, was the means of discovering the Gunpowder Plot. Francis was imprisoned and his estates were confiscated and sold to the Cockaynes, who completed the house in accordance with the prevailing style, and made it their home till the beginning of this century. They were a hard-living race, and fell at last the victims of their own extravagances, and their beautiful house passed to others better able to preserve it.

The history of Rushton is too long to tell here and now,—the growth of the hall, the making of the ornamental waters, the erection of the open-air bath, over which a melancholy nymph still presides in classic chilliness. Or the destruction of one of its two churches, and the removal of some of the monuments to the other, where a good recumbent effigy of Sir Thomas Tresham, the last Prior of the Order of Saint John of Jerusalem, is still to be seen. Nor had the party time to see these things, nor even to complete the contemplated programme; for Rothwell Market House and the fine, though somewhat decayed, church had to be omitted, and the party were obliged to perform a hasty movement to Rushton station, whence a few minutes brought them to Kettering, where they dispersed.

It was then too late for them to see the very fine tower and spire of the church, which was restored last year, and, for some 30 ft. from the top, rebuilt in Weldon stone. Advantage was taken of the scaffolding erected at that time to make a carefully-measured drawing of the whole tower and spire, a reproduction of which we are enabled to present to our readers this week. The church itself has no great pretensions to beauty, although the nave arcade is fine and the whole interior is spacious; but the tower and spire are hardly to be equalled anywhere for the graceful manner in which they taper upwards, and for the elegant proportion of their stages. The castellated turrets at the angles are curious as embodying a conventionalised adaptation of defensive design, and as helps to the general composition they are invaluable, rendering the outline of the structure pleasing from whatever point of view it may be seen. There is nothing to fix the date of the church beyond the character of the work, which in the case of the tower and spire points to the middle of the fifteenth century.

#### THE TEMPLE OF APOLLO AT DELPHI.

**I**N his travels about Greece, the ancient writer Pausanias seems to have preferred a land route wherever the alternative presented itself of going part of the way by sea. It was so on his visit to Delphi. Yet there are many reasons for approaching Delphi rather from the sea, from the small port of Itea. The ascent is by no means tedious, and at length, when the site of the ancient city is reached, the cliffs that shelter it stand out in all their stupendousness. At such a moment the impression of natural grandeur is one never to be forgotten. From the foot of these great cliffs the ground at one place slopes quickly down towards a deep ravine. To build on that spot implied the construction of a level platform, with a retaining wall towards the ravine. How many walls of that kind there may still be under the village of Delphi (or Kratis, as it is now called) it is impossible to conjecture. But there is one of them still to be seen. It is, in fact, one of the most attractive features of the ruins as at present visible.

We mean the so-called Pelasgic wall. It is not Pelasgic, nor polygonal, in a true sense, because its face has been worked smooth, and covered with ancient inscriptions. The articulation of the blocks is polygonal, and that is all.

On the platform, supported along its steepest side by this wall, the temple of Apollo is believed to have stood. The inscriptions on the wall, of which many are records of the enfranchisement of slaves, are just such as would be expected on a temple of Apollo at Delphi. The locality is just that on which we should expect to find the famous temple. Fragments of columns have been found, and now Prof. Middleton, having measured them when he was exploring the site some years ago, produces a sketch for the restoration of the temple. He diffidently thinks that his sketch may be premature, the general notion being that we are on the eve of fresh excavations on the site by the French School at Athens. But the preliminary arrangements for these excavations have been so long impeded by the Greeks that there is little expectation of their being speedily begun. One thing is certain, that the first day's work in following up the Pelasgic wall will bring to light things of the utmost importance. Let us hope that a kindly fate has preserved the sculptures as well as the more strictly architectural features.

The sculptors were, first, Praxias, who left his task incomplete; and, next, Androsthenes. Both were Athenians, and of Praxias it is told that he had been a pupil of the famous sculptor Kalamis. We learn this from the traveller Pausanias (x., 19, 3), who tells us also that in the pediments were represented: Artemis, Leto, Apollo, the Muses, the setting of Helios, Dionysos and the Thyiades. How these figures were distributed in the two pediments he does not say. To the poet Euripides, however, we owe an inspiring sketch of the sculpture of the temple ("Ion," v. 187 fol.). It did not suit his purpose to refer to the pediment figures in any special manner. He was dealing in the "Ion" with a plot which turned on Kreusa with her drops of Gorgon's blood, and any reference he could introduce in the early part of the drama to beings of a serpent or semi-serpent nature would serve as a prelude. He points first to Herakles slaying the Hydra, next to Bellerophon slaying the Chimera, and then goes on to specify deities slaying giants, which, in art, were usually of anguiped form. It has been generally supposed from his noticing these scenes as if they formed separate groups, that he was thinking of the metopes of the temple, and, no doubt, that is a fair inference as regards Herakles with the Hydra, and Bellerophon with the Chimera. We may assume that he has selected these groups, appropriate to his drama, from the metopes. But the case is different when he proceeds to the fight of gods and giants. There his words imply a crowd of figures. He says: "Look at this tumult of giants on the walls." In a series of metopes there could be no tumult of figures; nor could metopes be on the walls. The alternative is to take the poet as referring to the frieze of the temple when he thus speaks of a war between gods and giants. We conceive the chorus as standing in front of the temple and looking at its sculptures, noticing first the pediments in a general way, and next the metopes, among which they recognise two suitable groups—Herakles with the hydra, and Bellerophon with the Chimera. They then advance up the steps of the temple, and admire the frieze with its Gigantomachia, picking out certain groups of combatants for admiration. Having done this, the chorus finds itself at the door of the temple, and asks about admission. On this part of the subject Prof. Middleton's paper, as read at the Hellenic Society on Monday, did not enter. Possibly it lay outside his scheme. But we venture to recommend to his notice a fresh examination of the text of Euripides, to see whether the traditional opinion as to metopes is tenable or not.

It is assumed that the temple which was standing in the time of Pausanias was the temple built by the Corinthian architect



Spintharos. It would be in every way satisfactory to recover the details of it. But it would be still more satisfactory if excavations should reveal at Delphi, as at Eleusis, something of the various temples that preceded the building of Spintharos. Traces of the previous temple by the half-legendary Trophonios and Agamedes would be a surprise, and what should we not say if evidence could be obtained to clear up in some way the impossible tale of a yet older temple built of wings and wax, or the still older, but more intelligible, temple in the shape of a wooden hut? Funeral vases in the shape of a hut, *tugurium*, and of the most primitive fabric, have been found under the lava at Albano, and it is not at all unlikely that a primitive temple would take that form.

## NOTES.

**L**T is exasperating, and even alarming, to note the frequency of cases in which the communication cord on railways "fails to act." The latest case of this kind occurred on the 18th inst. on the Midland Railway. It appears that a party of domestic servants travelling from Scotland to London occupied two adjoining compartments in the night express, and shortly after leaving Leicester a footman named Foster, while leaning out of the window in an endeavour to attract the attention of the occupants of the next compartment, caught his head against a bridge and was instantly killed. Of course, his fellow-passengers immediately endeavoured to have the train stopped, but without success; and it was actually nearly three-quarters of an hour before they could attract attention. The Midland guards cannot see along the train (as they can on some lines) without putting their heads out of the window, and consequently the train passed station after station unchecked, eventually stopping just beyond St. Albans. A theory has been put forward to account for the failure of the communication,—satisfactory enough, perhaps, to the official mind,—for it was asserted at the inquest that the apparatus was in "perfect working order." But no explanation whatever will be regarded as satisfactory by the travelling public. It was useless to tell the terrified occupants of the compartment that they should have pulled the cord towards them from the rear of the train instead of trying to attract the driver by pulling at his end. Who notices whether the carriage he travels in is nearer to the guard than to the driver? Who, in a crisis like this, would imagine that such calculations would enter into the simple question of stopping the train? Why should it be necessary to pull away at the cord as if engaged in hauling up an anchor? For we may be certain that in this case it would be tugged vigorously enough,—indeed, one of the witnesses stated that they pulled it six or seven times, but this does not appear to have been sufficient. We do not willingly find fault with the Midland Railway Company, for they are unquestionably far in advance of some of their fellows in studying the comfort and safety of their passengers; but a reform is loudly called for here. Communication with the officials being only necessary under very exceptional circumstances, railway passengers should be able to ensure it without a shadow of doubt as to the efficiency of the means provided. These should be perfectly simple. It is, moreover, extremely desirable that the system of communication adopted should be uniform on all our lines.

**T**HE Glasgow Exhibition will close on the 10th prox. The turnstiles already record the large number of five millions of visitors, and it is believed that there will be a very large money surplus. Naturally enough, there are many aspiring projects whose friends are putting in their claims to this surplus, or a portion thereof. A technical college, a musical college, the Mitchell Library, Fine Art Galleries, and the Glasgow

School of Art and Haldane Academy are among the numerous claimants. While hoping that the surplus will be large enough to give substantial aid to all these institutions, we wish to cordially endorse and support the suggestion made by Mr. David Thomson, the President of the Glasgow Institute of Architects, in his address to that body the other day, as mentioned in another column. Mr. Thomson suggested that the Glasgow Institute should approach the Executive Committee of the Exhibition, to urge upon them the desirability of spending 5,000*l.* or 10,000*l.* of the surplus (if so much could be afforded) in founding a Chair of Architecture in the University. In Mr. Thomson's words, "it would be one of the most suitable, one of the most satisfactory, and one of the most praiseworthy acts that could be done, and a very proper and suitable mode in which a part of the surplus, at least, might be expended."

**A** NEW edition of the list of members of The Institution of Civil Engineers has just been issued, from which it appears that there are now on the books 5,529 members of all classes, as against 5,328 twelve months ago. The present total is made up as follows:—Honorary Members, 19; Members, 1,614; Associate-Members, 2,499; Associates, 458; Students, 939 (these figures are corrected to October 1). As will be seen, there is a considerable class of "Student"-members, who hold periodical meetings of their own, and read and discuss papers amongst themselves, under the chairmanship of senior members of the Institution. These meetings of "Students" are, we hear, becoming increasingly useful and helpful to those who take part in them, and they are altogether supplementary to the meetings of the senior members of the body, which are held weekly during the session. The list of meetings of the institution for Session 1888-89 is now before us. From it we learn that between November 13 next and May 21, 1889, there will be twenty-five ordinary meetings and twelve Students' meetings—a very good programme. The Institution is to be congratulated, not merely on its prosperity, but on its capacity for work.

**W**E hear that Miss Harrison, whose lectures on Greek archaeology at the British Museum and at South Kensington have been so successful, is one of the candidates for the vacant Chair of Greek Archaeology at University College, London.

**D**R. H. BRUNN'S great work on the "Griechische Künstler" appeared in 1857. It has ever since been the standard book of reference, and a work, we may say, as remarkable for its almost prophetic insight as for its careful and laborious accumulation of detail. It has been out of print many years, and second-hand copies have of late been eagerly sought for. A second edition is at last announced. The first "lieferung" has no doubt been eagerly cut open by many an archaeologist, only to be closed with bitter disappointment. The new edition is—so far as can be judged from this first number—merely a reprint. The notable discoveries of the last fifty years, it seems, to be wholly ignored—Delos, Olympia, the Acropolis of Athens, are as if they were not. We naturally turned at once to the earliest school of marble sculptors, the "family of Melas at Chios" (p. 29). There, after due citation of Pliny and the scholiast on Aristophanes, we are amazed to read "Melas and Mikkiades are known only by this single mention in Pliny (Melas und Mikkiades sind uns durch diese einzige Erwähnung des Plinius bekannt)." This is enough—we most frankly own we read not a single word further. Let those who possess the first edition stick to it, and not go to the expense of the second. The best supplement to the old book is not the new reprint, which has nothing to recommend it but better print and a rather bigger page, but Loewy's admirable "Inchriften der Griechischen Bildhauer." We can well understand that Dr. Brunn, at his advanced age, with his heavy professional duties, could

not undertake a second revised edition; his first is his life-monument. But where are his pupils?—a band whose devotion is known through all Europe.

**T**HE carved red lion until lately in Holywell-street, Strand, to which we briefly referred last week, was generally believed to be associated with the once neighbouring Lyon's Inn. It was fixed at the end of the narrow passage which, by the side of the old house, No. 36, with gilded sign of the Crescent Moon, leads into the Strand. Lyon's Inn was demolished about twenty-two years ago. The Globe and Opera Comique Theatres, between Holywell and Wych-streets, stand over its site. In the Inn hall the Architectural Association, founded in 1842, used to meet until, we think, 1859. Ordinary guide-books quote Sir George Buc (in Howes' "Annals," 1631) to the effect that a hostelry here, by sign of the Lion, was bought *temp.* Henry VIII. by some lawyers, and converted into an Inn of Chancery. But in W. Herbert's "Antiquities of the Inns of Court and Chancery" (1804) reference is made to the steward's old books of account, which contain entries made *temp.* Henry V., and Herbert adds, "How long before that period it was an Inn of Chancery is uncertain." The government of the Inn, annexed to the Inner Temple, was vested in a treasurer and twelve ancients. Here, in 1678, Sir Edward Coke was Reader. He had been admitted of Clifford's Inn 1571. The one small court—planted with trees, and with one entrance from Holywell-street, and another out of Newcastle-street, *olim* Magpie-alley—had chambers to north and east. In the south-western corner, abutting on the rear of Holywell-street, stood the hall, of date 1700, its front elevation surmounted by a pediment bearing the carved sign of a lion rampant. Of late years the Inn acquired an unenviable notoriety, especially as the residence of Weare, the professed gambler, whom John Thurtell, starting with him in the gig,—emblem of respectability,—decoyed out of town, and murdered close by Probert's cottage in Gill's Hill-lane, near to Radlett, Hertfordshire.\* The cottage by the pond, visited by Sir Walter Scott on May 28, 1828, was dismantled in November, 1884. Thurtell was a carpenter in his way, and designed the scaffold, now preserved at "Madame Tussaud's," whereon he was executed, through his accomplice's evidence,—on January 9, 1824. We hear that two other relics of Old London are about to be removed to the Guildhall Museum. These are C. G. Cibber's recumbent figures of Raving and Melancholy Madness, which formerly rested on the gates of Bethlehem Hospital in Moorfields,—*ἰκοναὶ τῶν τῶρος καὶ λῆδος τῶρος ἑστῶν*—and for some while past have been lodged in the South Kensington Museum. We gave a few particulars about them and the hospital of St. Mary of Bethlehem in our columns of June 4 last year.

**F**OR some time past French art has been suffering heavy losses. But lately there disappeared from the Académie des Beaux Arts Gustave Boulanger, one of the most authoritative representatives of Classic art, and now landscape and the new school of sculpture lose each an artist of very real and much-appreciated merit: the sculptor Longepied and the painter Feyen Perrin. The death of Longepied is a great loss for modern art, for, though scarcely thirty-nine years old, he has left us some remarkable works, that place him in the first rank among artists. After having studied successively under MM. Cavalier and Mathurin Moreau, he became the pupil and inseparable friend of Couté, with whom he worked upon the monumental fountain which is to decorate the park of the Exposition Universelle in the Champ de Mars. The marble statue of the "Fisherman drawing up the head of Orpheus in his nets," which decorates the lawns of the Ranelagh and belongs to the City of Paris, gained him, in 1880, a medal of the third class. In 1882, he

\* This gig and the roan horse were exhibited, during the trial, at the Surrey Theatre.



tained, with the model of his magnificent cup "Immortality," a first medal and the *prix du Salon*. The same group, executed in marble and exhibited in the Salon in 1886, is now in the Luxembourg. An illustration of it has appeared in the *Builder*. Finally, last year, upon the inauguration of the monument raised at Provins to the heroes of the National defence, the Government decreed him the cross of the Legion of Honour. Among his prizes must be mentioned, also, the charming statue of Mdlle. Bashkirtseff, the young Russian artist who died also so prematurely, some years ago, that of Madame Berraudo, exhibited at the last Salon, the statue of Ledru Rollin which decorates the Hôtel de Ville, and that of Danton, erected about two months ago at *le Bois-sur-Aube*. Longepied's death occurred while he was preparing a very considerable work for the Exhibition of 1889, and is, as we said, a very serious loss for French art. He was in all the vigour and exuberance of life, and to him apply the beautiful verses at he caused to be engraved on his group "Immortality" :—

*Héroux l'Élu des Dieux qui nous quitte avant l'heure,  
S'il te voit près de lui, sainte Immortalité,  
Un sublime baiser si ta lèvre l'effleure,  
Et s'il va, dans tes bras, à la Postérité."*

At the obsequies of the painter Feytaud, Perrin took place on the same day, and at the same hour at which Longepied was carried to his last resting-place. He was buried at Nancy in 1829, and after having studied under MM. Léon Cogniet and Yvon, he entered the École des Beaux Arts. He gained medals in the Salons of 1865, 1867, and 1874, and in 1878 obtained the cross of the Legion of Honour. His speciality was sea-pictures, and his studies of the coast-folk of the Normandy and Brittany coasts have a well-merited reputation. The museum of the Luxembourg possesses an excellent picture by this artist, called *Return from the Oyster-fishing during the Spring Tides at Cancale*. Feytaud Perrin was a conscientious painter, with a facile and elegant manner. Perhaps he may be reproached with having idealised a little too much the type of his figures, which have about them that native ruggedness inherent in persons whose life is so laborious, but his canvases are full of poetry and of fine and well-blended colour. Though suffering for many years from an incurable disease, the courageous artist has never ceased to take part in the annual exhibitions, and in the last Salon was presented by two pretty little pictures—*Une faveuse* and *L'Étroit sentier*. M. Feytaud Perrin was to have carried out an important piece of decoration in the salons of the new Hotel de Ville.

The walls of the Fine Art Society's Gallery are once more covered with a collection of "water-colour drawings" by various artists, considering that most of the contributors are artists of name, and that a considerable majority of them are members of either the Society or the Institute, the average quality of the work might have been higher than it is; perhaps the wet summer is partly accountable. However, there is plenty to attract visitors to the gallery, and first, in the order of the catalogue, come two bright drawings of blue water and boats, by Mr. W. A. Wyllie, and a sketch, No. 21, by Mr. Henry Moore, A.R.A., not much more than a rough note of the colours of sea and sky on *"A Silvery Morning,"* but with plenty of vigour and a fine sense of colour. Mr. Wilfred Hall's little sketch, *"Afternoon Sunshine,"* will probably attract attention, and so will Mr. Herbert Marshall's *"Haarlem,"* a beautifully-raven and coloured sketch of picturesque buildings, with some equally picturesque little figures in the foreground, so placed as to complete the composition in a very neat and masterly manner. Mr. Walter Crane's *"Diver"* is an odd and not very attractive work; but Mr. Arthur Severn's *"Rainbow at sea"* is a fair specimen of his always enjoyable pictures. Mr. Hugh Carter's *"Scenes from Dutch Life,"* No. 59, are strong, but not so

strong as Mr. Marshall's *"Hoorn,"* No. 65. Among others, Mr. J. MacWhirter and Mr. C. E. Johnson send good work; and among the contributions of still-life studies Mrs. Cecil Lawson's are conspicuous.

An exhibition of drawings and sketches of "Our Country and our Country-folk" has been opened this week at Messrs. Dowdells. The highly-finished and, for the most part, bright and pretty little water-colours that make the bulk of the collection are all the work of Mr. Arthur Hopkins and Mr. C. Robertson, two members of the Royal Society of Painters in Water-Colours. Most of Mr. Robertson's works are remarkable for the marvellously laborious manner in which they are finished, and for their clearness and sparkling brightness. Water is introduced into a large number, and the figures, where any appear, are usually anglers or fishermen. One of the best is No. 71—a sketch at Guildford of a quiet bit of river running between the old houses, two children angling in the purple shadows on one side, while the sun brightly illumines the other. There is a contrast of bright sunshine and shadow in this picture which is very pleasant. So also is a somewhat similar contrast in No. 38, *"Passing Showers,"* in which a stretch of sandy common is shown, with trees and a few red-roofed cottages in the background, all in the shadow of the clouds, except where a gleam of sunshine illumines a patch of yellow sand. Mr. Hopkins's work is rather unequal; *"A Shrimper,"* No. 8, a sketch of purple evening shadows on sky and sea, with the solitary figure of the shrimper as the only solid object in the landscape, is strong; and so is No. 28, a somewhat similar subject, in which a single figure stands out against a background of sea and sky. No. 64, too, a sketch at Robin Hood's Bay, is very good indeed; but there are others that lack much interest of any sort.

It has not frequently happened that a lady has been commissioned to paint the panels of a *rederos*—at least directly; but the design of Miss Dora Noyes was lately chosen from among those submitted for the decoration of the *rederos* of St. Luke's, Uxbridge-road, and has been very successfully carried out. The end of the church is covered with conventional cusped panelling, and the problem before the artist was made considerably more difficult by the extreme narrowness of the middle panel. This has been successfully overcome by placing the lamb in glory in the narrow panel, while a crowd of cherubim, seraphim, and the heavenly host occupy the larger panels at the sides. The whole is very decoratively treated, and Christian symbolism has been carefully studied. At each side of the altar are two large panels, each couple of which has formed the ground for a single picture rather unpleasantly divided down the middle by the mullion. These pictures are very good specimens of religious art, conceived in the right spirit and carried out with considerable technical skill. The subject on one side is the Adoration of the Shepherds, and there is a very pleasant originality in making one of the herds a boy. On the opposite side is the Way of the Cross, and it says everything for the feeling of the artist that one can look at such a picture and feel there is no such jarring note as is almost always to be found in modern religious works.

#### EXHIBITION OF PASTELS AT THE GROSVENOR GALLERY.

It is to be hoped that the exhibition of pastel drawings at the Grosvenor Gallery will really prepare the way for a revival of so charming a method of artistic expression in this country. The work of some of the French exhibitors points clearly to the conclusion that, for portraiture at any rate, there is little that is beyond the powers of the medium in the hands of a master of it; while the exhibits of others as clearly show how exactly it is adapted to that class of studies which are more than sketches and less than pictures. Such studies as fre-

quently show the individuality of the artist more forcibly, and his ideas more freshly, than his finished works, and are not unjustly sometimes valued as highly. If it is true that a "fixatif" has been invented which will prevent the pastel from rubbing, without destroying its surface or affecting in any way the colours, then the greatest objection to the use of the medium has been removed, and with the improvements that have been introduced in the pigments, coupled with the comparative cheapness of production, it will be surprising if pastel drawings do not become popular with both artists and the public.

One of the first things that strikes a visitor to the Grosvenor is the marvellously skilful handling of some of the members of the Société de Pastellistes Français. Most of the English exhibitors have either fallen into hardness, or have become smudgy or misty, and have failed, either through lack of skill or because they have not thought it worth while, to obtain anything in the shape of surface or texture. But to the more practised French artists no such difficulties seem to present themselves,—or, possibly, a better knowledge of the material and the limits of its powers has saved them from often making attempts likely to end in failure. The portraits of M. J. E. Blanche are the works in which this skill in technique, combined with higher artistic powers, is most conspicuous, and he hardly needed the aid of such charming subjects to recommend his work to the English public. In the *"Portrait of Mdlle. J. M."* alone has he at all approached failure, while his portraits of Mdlle. Bartet, of the Comédie Française, and of the Donna Olga Carraciolo, are quite unqualified successes, beyond which it would seem impossible to go. Mdlle. Bartet, a very pretty, quiet-looking woman, is seated, dressed in a loose, black evening dress of soft material, which falls, or is drawn, into the pleasantest folds, and contrasts charmingly with her white feather cloak, the drawing of which is quite wonderful. The other picture shows a pretty child in a red dress and spotted pinafore, standing against a light curtain, smiling and very graceful. M. J. L. Machard and M. Roll display in their contributions almost equal skill, but their nude figures, however perfect from the artist's point of view, are not of a class to appeal to the English public as a whole; M. Machard exhibits, indeed, some portraits, the handling of which is masterly, but they lack the refinement of M. Blanche's work. The portraits of M. Emile Lévy, especially his *"Mme. D.,"* No. 249, and of M. G. Dubafe, will be studied with interest, as will the work of M. P. A. Besnard, especially his portrait No. 152. The boldly-drawn studies of M. P. Helleu must command the admiration of all by their breadth and freedom, and to a certain school his work No. 148 will appeal with especial power. M. Hubert Vos, who is becoming a power in London among a number of young artists, contributes several otherwise excellent works, some of which betray a peculiarly sympathetic nature, but which we consider are spoilt by an all-pervading, but apparently intentional, mistiness.

Among the English contributors, Mr. W. E. F. Britten's crisp and beautiful studies, somewhat in the manner of the old Italian masters, are most conspicuous. This artist exhibits a large number of such studies, most of them small in scale, but all alike displaying their author's wonderful command of line-drawing and spirited design. It will suffice to mention *"The Ace of Hearts,"* No. 266, and the figures of dancers, Nos. 218 and 219, lent by Mr. Geo. Hitchison, A.R.A. Mr. Solomon J. Solomon's *"Miss Ethel Wright"* is the most ambitious of the English portraits, and has obtained a place of honour; it is a striking work, but the artist has failed in the tints and texture of the flesh, especially as regards the right arm. Mr. Walter Langley's *"Cornish Fishwife,"* No. 86, is an exceedingly successful study in cool, soft tones, well drawn and well composed. Mr. Yeames's *"En Vivan-dice"* is a charming and spirited picture, and Mrs. Louise Jopling's portraits claim a word of praise; Mr. J. J. Shannon, too, contributes two charming studies of heads.

Among the landscapes, Mr. Arthur Severn's pictures from the Somme, and Mr. J. Aumonier's *"On the South Downs,"* are among the most successful; while the unfinished studies of Mr. William Stott, of Oldham, appear much less affected when the medium is pastel than when it is oil. Mr. Whistler's sketches in Venice will, of course, be studied



with interest, and so will the portrait by Mr. Holman Hunt, drawn in red and black, in the manner of the pastels which were once a popular form of artistic expression. The powers of the medium have been greatly enlarged, and it yet remains to be seen whether, in English hands, it may not be as successfully used for landscape as it is by our neighbours for portraiture.

#### THE TEMPLE OF APOLLO AT DELPHI.

THE Society for the Promotion of Hellenic Studies held its first general meeting for session 1888-9 on Monday afternoon last, at 22, Albemarle-street, Mr. Sidney Colvin, Vice-President, in the chair.

A long and interesting paper on "The Temple at Delphi," by Professor Middleton, was read by Mr. George A. Macmillan, the Hon. Sec. (in the absence, through illness, of the author).

After some introductory remarks, the author of the paper remarked that now that the long-expected excavations on the site of the Delphian temple were, it was to be hoped, about to begin, it might seem an unfortunate time to deal with the subject; but, in the first place, some of the evidence afforded by the remains which he was able to measure some years ago could hardly be contradicted by future discoveries; and, secondly, it was well before beginning an excavation to seek out from all available sources what records existed about the building, so as to know what to look for, and how to read the lesson taught by even the smallest piece of detail. For that reason he now laid before the Society such literary and other indications as he had been able to collect about the temple, and also a hypothetical restoration of the building, in spite of the probability of its being in some respects confused by future discoveries. According to the tradition handed down by the Greeks, there were five successive temples built to enshrine the world-famed oracular chasm of Delphi. The first three temples seemed to have belonged to a pre-historic period, earlier than the date of the Homeric poems, and anterior to the introduction into Delphi of the cult of Apollo and other celestial deities. Pausanias gave a list of those five temples, without, however, distinguishing those which were earlier than the Apollo cult. The legend as to the first temple was that it was made from branches of bay; that as to the second temple was that it was built by bees, with bees-wax and with wings. The third temple (according to the myth quoted by Pausanias (x., 5), was constructed of bronze, by Hephaistos. To show that a bronze building was not an impossibility, Pausanias mentioned Danaë's tower and other buildings, but stated that he did not believe in Hephaistos having been the builder of the third temple. All that he said about the fourth temple was that it was built of stone by Trophonios and Agamedes, and that it was destroyed by fire when Ericleides was Archon in Athens, in the first year of the 58th Olympiad (548 B.C.). With the founding of the fourth temple we had come to the period of the advent of Apollo to Delphi, as described in the Homeric hymn to the Pythian Apollo, which relates how the deity, after visiting Olympus, journeyed to various places in search of a home, finding none to suit him till he reached the port of Delphi. Landing there, he said: "I will build a splendid temple to be an oracle for men; they will bring hecatombs from Peloponnesus, from Europe, and from the isles; and I will make revelations to them in my temple." Then Phaibos Apollo laid massive foundations, and on them Trophonios and Agamedes, sons of Erginos, laid the stone threshold, and countless crowds of men raised the temple with smoothly-cut blocks of stone. On the destruction of the fourth temple, a meeting of the Amphiktionic Council was held, and it was then decided that a quarter of the cost of the new temple—viz., 75 talents,\*—should be borne by the people of Delphi, and that the remainder of the 300 talents needed for the work should be collected as donations from the rest of the civilised world. In some places, according to Herodotus, was so handsome a subscription given as in Egypt, where the Greek colonists of Naukratis and elsewhere subscribed twenty *mine*, and King Amasis contributed 1,000 talents of alum. The architect selected by the Amphiktionic Council was a Corinthian named Spintharos, a hitherto unknown name (Pausanias, x., 5). The contractors for the new

building were, as Herodotus (v., 62) records, some wealthy members of the Alcmaeonidae family, who were then exiles from Athens through the enmity of the Peisistratid Hippias, after the death of the partisans of Kylon. The Alcmaeonidae were not only wealthy, but had been possessed of political influence, partly arising out of their friendship with Croesus of Lydia, himself the most munificent of benefactors to the Delphian shrine. According to the contract drawn up between the Amphiktionic Council and their builders, the temple was to be built of local limestone (*πάρωνος λίθος*); but, with great liberality, the contractors made the columns of the front of white Parian marble. With the exception of the external sculpture, which we learnt from Pausanias was not finished till the latter half of the fifth century B.C., the building could not have taken many years to complete, considering the enthusiasm of the contractors and the ample supply of money which poured in from so many sources. In all probability the temple was fit for use before the end of the sixth century B.C. Pindar, writing about 490 B.C., spoke of it as if it were not in an unfinished state. Its beauty was celebrated by Euripides, by whom the two sculptured pediments were specially mentioned. Spintharos's temple was, as might be expected from its date, a Doric hexastyle peripteral building, with sculpture in both pediments and in some of the metopes.

Having discussed the sculpture and other details of the building by the light of information gleaned from ancient sources, Professor Middleton dealt with the few existing remains of the temple. He said that as far as we knew it, the Doric architecture of the Greeks in the sixth and fifth centuries B.C. was designed with a certain uniformity of detail which enabled one, from a comparatively small part, to reconstruct the whole with great probability of being not very far from the mark. Given that we had to deal with a hexastyle peripteral Doric temple designed by a Corinthian (Spintharos) in the latter half of the sixth century B.C., the first question to ask would be, What was the diameter and the intercolumniation of the columns of the Order? Luckily there was evidence of this. In 1875 the author was able to find and to measure thirty-two drums of Doric columns made of the rough siliceous limestone from the quarries of Mount Parnassus, and still in part retaining their coating of very hard, fine stucco, made of lime and powdered white marble, which appeared always to have been used by the Greeks to coat temples which were not built of red marble. That beautiful substance was quite unlike anything which we now called stucco. It was as hard and durable as real marble, and took by polishing the same delicate, ivory-like surface as the best Pentelic marble. Moreover, it had the advantage over real marble of affording a slightly absorbent ground for coloured decoration. These column-drums naturally varied in size, owing to the diminution of the shaft; the largest measured (including the stucco) close upon 5 ft. 9 in. in diameter, thus giving the size of the column at the bottom. The top diameter, 4 ft. 2½ in., was given by the necking of the capitals, of which a few examples were still to be seen. As none of the drums of the columns were still *in situ*, the only way to discover their intercolumniation would be to make out the length of the architrave blocks. After long search the author found one of these blocks\* which had its ends sufficiently perfect to give the complete length; this was 13 ft. 3 in., giving such an intercolumnar space as might be expected from the analogy of other Doric temples, namely, 7 ft. 6 in. clear between the bottoms of the shafts.† The drums of the shafts had twenty flutes, like those at Egina, the older and the present Parthenon, and other Doric temples of about the same period. Their average thickness was about 2 ft. 6 in. These data enabled one to set out the fronts of the temple, allowing a slight additional diameter and closer intercolumniation at the angles, according to the Doric rule. Thus the author, in his restoration of the temple (of which he exhibited drawings), had conjecturally made the angle-shafts 6 ft. in diameter, and the intercolumniation 7 ft. 4 in. This would give a width of 72 ft. 2 in. for the temple, measuring from the outside of the columns, or about 72 ft.

6 in. on the top step. Comparing this with other hexastyle Doric temples,† that at Delphi would range thus:—

|                           |              |                      |
|---------------------------|--------------|----------------------|
| Temple at Egina           | 46 ft. 6 in. | wide on the top step |
| "Thesum" at Athens        | 45 2 "       | "                    |
| Temple at Bassæ           | 48 2 "       | "                    |
| Herion at Olympia         | 57 0 "       | "                    |
| Pre-Persian Parthenon     | 66 0 "       | "                    |
| Temple at Delphi          | 72 8 "       | "                    |
| Temple at Corinth         | 73 0 "       | "                    |
| Great Temple at Paestum   | 78 10 "      | "                    |
| Temple of Zeus at Olympia | 90 0 "       | "                    |

It might be a coincidence, but if so, it was a remarkable one, that these dimensions of the temple at Delphi worked out so as to give a front almost exactly the same as that of the temple at Corinth, the Delphian temple being designed by a Corinthian architect. The columns of the temple at Corinth measured 5 ft. 10 in. in lower diameter, as against 5 ft. 9 in. at Delphi; but the intercolumniation at Corinth was (at least on the flanks) closer than in the Delphian temple, as might be expected from its much more archaic style. The number of columns which the author (in his restoration of the temple) had shown on the flanks, and consequently the length of the whole temple, and its sub-divisions into *pronaos*, *cella*, and *adyton* were purely conjectural. The following table shows the variations in proportional length of the chief hexastyle Doric temples, omitting those of Sicily as being abnormal in many respects:—

|                                 |                          |
|---------------------------------|--------------------------|
| The Herion at Olympia           | 26 columns on the flanks |
| Temples at Corinth and Bassæ    | 15 "                     |
| Great Temple at Paestum         | 14 "                     |
| So-called "Thesum" in Athens    | 13 "                     |
| Temples in Egina and at Rhanius | 12 "                     |

Thus, with the authority of the temple at Corinth, in order to give ample space for the sanctuary, and also a large *cella* for the quarters of the Oracle, the author on his plan has conjecturally shown the Delphian temple with fifteen columns on the flanks, thus giving a total length on the top step of about 192 ft. In addition to the large drums of *πάρωνος λίθος* there were about seventeen fragments of smaller Ionic columns of marble, which, as suggested by M. Foucart,† probably stood within the *cella* as the author had indicated on his plan. Among those fragments were some much-shattered Ionic capitals, which appeared to fit the smaller pieces of shaft. From their fully-developed Ionic style, these could hardly have belonged to Spintharos's original temple, which probably had inner columns of Doric style, as was still to be seen at Paestum, both in the upper and lower tier. They might, perhaps, be part of the restoration of the temple which was carried out by the Amphiktionic Council after the third Sacred War, c. 348 B.C. Stephanus Byz. (s. v. Δελφοί) spoke of part of the fourth temple—that attributed to the mythical sons of Erginos—as having survived at later times. It seemed quite probable that the stone chamber immediately over the rock chasm might not have been wholly reconstructed when the fifth temple was built. A partly subterranean stone chamber would probably escape the effects of the fire which destroyed the main part of the temple, and its special sanctity would naturally lead to its being preserved at the rebuilding in the sixth century. Hence in his drawing the author ventured to suggest such a vaulted structure as might naturally have been associated with the names of Agamedes and Trophonios, the builders of the treasury of the Boeotian king,—such a stone vault as we saw in the various so-called treasuries at Mycenæ. Judging from Pausanias's description of the so-called cave of Trophonios, the subterranean oracular cell must have been a vaulted chamber of this description. Passing on to speak of the style of the details of the temple at Delphi, the author said that as the temple was one of which we knew the date from literary sources, it would be interesting to examine the style of the few existing details as a guide to fixing approximately the date of other temples as to which we had no written evidence. The fourth temple at Delphi was, already mentioned, burnt in 548 B.C., and if we allowed (say) eight years for preparation and collection of money, the last temple would be designed and begun about 540 B.C. The chief archaisms or points in which the earliest Doric temples differed from those of the most perfect

\* Shown to be an architrave block by the traces of the gutter on its upper edge.

† The architrave blocks of the old Parthenon (destroyed by the Persians) which exist built into the Acropolis wall also measure 13 ft. 3 in. in length.

\* About 18,000*l.*—the whole sum being about 72,000*l.*

\* Dr. Dörpfeld has recently discovered the whole plan of the temple at Corinth, including the foundations of the inner rows of columns in the *cella* and *opisthodomus* (See *Monisth. Instit. Athen.* for 1887, Part I.)  
† *Mém. sur les Ruines et l'Histoire de Delphes* (Paris 1855), p. 68.



od,—that subsequent to the Persian inva-  
—were these:—

Stone wholly used instead of marble, the  
istional stage being the use of marble for  
its only.

The Doric Order used for internal columns,  
well as for those of the peristyle and  
naos.

Close intercolumniation of the peristyle.

Columns (proportionally) short.

Monoliths used for the shafts.

The diminution of the shaft proportionally

at the top.

The architrave deep.

The abacus of the capitals shallow and

ely-spreading.

The echinus of the capitals formed with a

bulging curve.

0. Imperfect use of entasis and the various  
or optical refinements which existed in the  
thenon and other temples of the best period,  
had been most ably shown by Mr. Penrose  
his valuable work on "The Principles of  
lenian Architecture."

The temple at Corinth gave the strongest  
mples of all these archaisms. With regard  
archaism No. 1, the temple of Apollo at  
lphi occupied a transitional position, being  
ly of marble and partly of local limestone.

er examples of this transition were the  
ples at Egina and Bassæ, in which marble  
was used only for the sculpture and for the

if-tilles. The temple in Egina and the great  
ple at Pæstum, both of which came near in  
e to the Delphian temple, had internal

urns in two tiers of the Doric Order, and it  
seemed probable that this was also the case  
the original building of Spintharos, in spite

the existence of the Ionic capitals already  
ntioned. The discovery of one block of the  
itrave was but a scanty indication of the

er-columniations at Delphi, as it was very  
bble that the spacing of the columns on the  
nt was slightly different from that on the

aks. It appeared, however, that the Delphian  
ple was less pycnostyle than those at  
rith and Pæstum, and more so than that at  
gina.\* During the development of the

ic style the columns appeared to have  
own steadily more slender in their propor-  
n. Thus those at Corinth were the shortest,

ng only four diameters, or eight modules,  
height; while those of the "Porticus of  
lilip" at Delos were the longest in proportion

which we had existing examples. The author  
is not able to discover the height of the  
lphian columns with any accuracy, but the

portion seemed to come very near to that at  
gina. As far as they existed, the columns at  
rith, now only seven in number, were wholly

monoliths. At Egina those on the fronts and  
e of those on the sides were monoliths. At  
æstum, as at Delphi, the shafts were built up

separate drums. The amount of diminution  
the Delphian columns at present remained  
ertain for want of accurate knowledge of the

ight, but it was certainly less than that of the  
lums at Corinth and Pæstum, and probably  
ally that of the Eginean shafts. In the earlier

mples, such as those at Corinth and Egina, the  
chitrave was deeper than the top diameter  
the column. In later examples it was less,

e.g., in the "Theseum," the Parthenon, and  
the temple at Bassæ. The Delphian architrave

cupied an intermediate position, being about  
ual in depth to the top diameter of the shaft.

most of the earliest temples the abacus of  
the capitals was shallower than the echinus,  
the verse being the case in late examples. Thus,

Corinth and Egina had the shallow abacus;  
hile the "Theseum," the Parthenon, and the

ple at Bassæ had the deep abacus. At  
æstum, however, in spite of the early date of  
the temple and its many archaic peculiarities,

the capitals had the deep abacus. As a rule,  
the earlier the temple and the shallower the

abacus, the more widely did it spread, and in  
this respect Pæstum followed the early rule.

the Delphian capital, on the other hand, agreed  
with the later group of temples, and had an

abacus of greater depth than the echinus,  
with a moderate spread or projection beyond  
the line of the shaft. So, also, the curve of the

elphian echinus was very unlike the bulging  
urabola of Corinth and Pæstum, and was even  
nter than that of Egina, being very similar

to the echinus of the "Theseum" at Athens.  
wing to the present scantiness of the remains,

it was impossible to discover to what extent  
the Delphian temples possessed the various


optical corrections which, to a greater or lesser  
extent, appeared to have existed in all known

Greek temples. The remaining points to notice  
about the Delphian capital were that it had


four hypotrachelia at the necking, shaped  
very much like those at Corinth. Pæstum,  
and also in some later temples. At Corinth

the capitals differed in having only three hypo-  
trachelia, four being more common, though not

universal, in the later buildings: the Parthenon,  
e.g., had five. The annulet below the necking

at Delphi consisted of one single square sinking,  
thus, , as in the "Theseum," the Par-

thenon, and many other examples. Other  
temples, such as those at Pæstum, Egina, and

Bassæ, had three annulets, each formed by a  
triangular-shaped nick, thus, . The original

object of this annulet appeared to have been to  
hide the bed where the capital rested upon the

top of the shaft, and also to prevent "flashing"  
or chipping of the sharp arrises at the edges.

The result of this comparison of the  
details of the temple of Delphi,—the date of

which we could fix as being between  
about 540 and 530 B.C.,—with those of other

temples which most resembled it, but of  
which we had no written records, would

be something of this kind: The Temple at  
Corinth must clearly be given a much earlier

date, probably a full century before that at  
Delphi, owing to its far more distinctly marked

archaisms. It had, in fact, always been recog-  
nised as the oldest example of the Doric style

which now existed in the mainland of Greece.  
The temple at Egina was in several respects

distinctly more archaic in its details than the  
temple at Delphi, and thus it would appear prob-  
able that the building itself must be some

half-century or more older than its pedimental  
sculpture, which could hardly be dated much

before the year 500 B.C. at the earliest. Though  
it was to be feared that future excavations at

Delphi would not bring to light much of the  
main temple, yet there was every reason to

hope that a great part, if not the  
whole, of the great stylobate or platform

on which the temple stood might  
be discovered, as it was below the present level

of the soil. At the time of the author's visits  
to Delphi the site was so encumbered by the

village huts of Kastri that it was impossible  
to make any serious search. The temple

appeared to have been built on a great platform  
constructed over a gentle slope inclining

down from north to south. On three sides,  
east, west, and south, this platform was

bounded by a massive retaining wall, and  
within the space thus enclosed the raised

paving was, in part at least, supported by  
rows of small stone chambers in place of solid

masonry. The *temenos* in which the temple stood  
was enclosed by a massive wall of polygonal

masonry, which was one of the most interesting  
relics of Greek workmanship. The masonry

was of the most extraordinary kind,—not to  
be seen anywhere out of Delphi. The poly-

gonal blocks, which measured in some cases as  
much as 7 ft. across, had their joints worked

and fitted with complete accuracy, and their  
exposed faces dressed to an absolutely smooth

surface. But the extraordinary point about the  
masonry was that many of the joints followed

a curved instead of a straight line, involving a  
most exceptional amount both of skill and

careful patience on the part of the Delphian  
masons, who had made the various curves

fit each other with perfect accuracy. Some of  
the beds, which ranged in a horizontal

direction, formed very complex undulating  
lines. In spite of the use of polygonal blocks,

the wall was evidently not one of an early  
period, but obviously belonged to a time

of the greatest possible skill in masonry.  
The mere use of polygonal masonry was, by

itself, no proof of great antiquity, and there  
seemed no reason to date the *temenos* wall at

Delphi earlier than the rebuilding by Spin-  
tharos in the second half of the sixth century.

On the south side not less than 300 ft. of this  
wall still existed in a very perfect state, except

that the top rectangular courses had in many  
places been removed. On this side the average

height, when perfect, was nearly 15 ft. The  
whole visible surface of this extraordinary wall

was covered with closely-cut inscriptions, of  
which there could not be less than a thousand,

and possibly many more, dating from the end  
of the third century B.C. down to the time of  
Hadrian or later. They consisted largely of  
decrees of the Amphiktionic Council, granting  
one or more special privileges to states or indi-  
viduals.

The discussion which followed the reading of  
the paper was principally of a literary char-  
acter, but

Mr. F. C. Penrose stated that he did not con-  
sider that the Ionic fragments referred to by  
Mr. Middleton necessarily belonged to a later  
date than the rest of the temple, instancing the  
very early use of Ionic, as evidenced by the  
recent excavations on the Acropolis at Athens,  
and referring especially to the archaic Ionic  
porous stone cap, which he considered belonged  
to the outer order of the early temple, the  
foundations of which had been recently laid  
bare between the Erechtheum and the present  
Parthenon. In reply to a question, Mr. Penrose  
said that he certainly thought these Ionic frag-  
ments might belong to the original design of  
Spintharos's temple.

Mr. Watkiss Lloyd referred to Ion's descrip-  
tion of the sculpture in this temple to be found  
in Euripides' play; and while he did not antici-  
pate that any portions of it were likely to be  
found in the course of excavations, he con-  
sidered that the question of their arrangement  
formed an interesting subject for study and dis-  
cussion. He also referred to the statement in  
one of Pindar's Odes that the Corinthians in-  
vented the triangular pediment, which he con-  
sidered of special interest in connexion with  
the temple at Delphi, since it was a Corinthian  
architect who was employed to design it.

Sir Geo. F. Bowen, the Rev. J. Hoskins-  
Abraham, Mr. Percival, and Mr. Farnell also  
took part in the discussion, and a vote of thanks  
was passed to Professor Middleton for his paper.

#### THE ARCHITECTURAL ASSOCIATION: PRESIDENT'S ADDRESS.

THE opening meeting of the session for  
1888-89 took place on Friday, the 19th inst., in  
the meeting-room of the Royal Institute of  
British Architects, the President in the chair.  
There was a large attendance of the members.

No fewer than seventy-five new members  
were nominated for election, and Mr. Bippolyte  
Blanc, of Edinburgh, was elected unanimously  
by acclamation.

Mr. Cole A. Adams, in moving the adoption of  
the report and accounts, which will be found in  
the "Brown Book," referred to the satisfac-  
tory increase in the number of the members,  
and to the usefulness of the new Classes.  
He regretted, however, that so small a per-  
centage of the members attended the Classes,  
and trusted that, as time went on, the numbers  
would be largely augmented. The A. A. Notes  
were not so useful as they would be if there  
was more co-operation on the part of the  
members. Mr. Appleton had done much for the  
A. A. Notes.

Mr. S. Flint Clarkson seconded the motion,  
which was put, and carried unanimously.

The Hon. Librarian announced several gifts  
to the library, and votes of thanks were passed  
to the several donors.

The prizes were then presented by the Presi-  
dent to the successful competitors. We pub-  
lished a list of these a fortnight ago (see p. 270  
*ante*).

Mr. Herbert D. Appleton, F.R.I.B.A., Presi-  
dent, then delivered the following address:—

That the Association has become in reality  
"The College of Architecture," affording the  
best preparation for the candidates for the  
Institute Obligatory Examination, I think can-  
not be denied; and with this important object  
only in view it has a great future before it.  
But looking to the terms in which the founders  
of our society defined its objects, namely, "to  
afford facilities for the study of Civil Architec-  
ture," "to advance the profession," "to serve as  
a medium of friendly communication between  
the members and others interested in the pro-  
gress of the art," it seems to me that there are  
other subjects besides the Examination which  
claim our attention; and with this in view, I  
propose to consider one or two suggestions for  
increasing the scope of our work.

With the present method of carrying on our  
work by means of honorary instructors, we can  
still include many studies which are not at  
present taken up; but I am well aware that the  
system has very definite limits and possibilities.

\* The author, in a foot-note, says: "It may be noted  
that Viruvius's remarks on (close) pycnostyle inter-  
columniation (iii., 3) are not applicable to Greek Doric  
architecture, about which he is evidently wholly igno-  
rant."



Instruction by Visitors who teach at night what they are practising during the day, and handing on the information they gain, qualified by their experience in its application to actual work, is the most direct method of teaching that can possibly exist. And the sympathy between the Visitors and the students is much greater, and the subjects treated much more practically appreciated than is the case when the instructor is dealing with a subject in which he has not this practical experience in working out the facts or theories that he teaches. It is this feature in our system which is the greatest cause of the success of the Association. The Visitors in most cases, being young practitioners, know the exact points where the students find difficulties, and having only recently acquired their knowledge, often from painful experience, are able to impart a very vital interest to their explanations.

The benefit to the Visitors is equally great, as it stimulates them to qualify themselves for the position they occupy as directors of the studies of the younger members, by thoroughly working up the subjects they undertake. But the number of the older members who act as Visitors must necessarily be small, and I am anxious to see the scope of the Association enlarged so as to bring a great many more of the older men into touch and work with the present working members.

The time has now come, in my opinion, when a new departure should be made in the work of the Architectural Association, by the organisation of a division for the study of modern design. We have in our Classes excellent opportunities for studying the Classical or archaeological side of our art; but the modern side is only treated in the Class of Design, and I think that, taking the ages of the members of this Class, it will be found that they are a younger set of men than used to form the Class, say ten or fifteen years ago, and I am afraid that it would be difficult to make the Class work if any large influx of older men joined.

But as each year the tendency of modern design is to free itself more and more from the fetters of precedent, which used formerly to bind it down to rigid accuracy, surely it is impossible to ignore altogether in the working of this Association the influence that contemporary work has on modern design.

As far as the prize-list is concerned, the Association offers no encouragement for the study of contemporary design, but rigidly draws the line at the eighteenth century. No prize, as far as my memory serves me, has ever been offered by the Association for the study of any building of a later period. In this I think that the Association is quite right, and if it were proposed to substitute the study of modern instances for the study of old examples, I am quite certain it would be a mistake. A careful training in the purer styles of Classic and Gothic must in all cases be undertaken in order to train the eye to their just proportions, and to appreciate the beauty and appropriateness of their mouldings and features. And the only way in which this can be satisfactorily done is by carefully measuring and plotting and sketching the actual examples of old work. In fact, without the study of old examples, half our interest in the good modern work of our best architects would be lost, because it is only through our knowledge of old work that we can appreciate the excellence of the rendering of the styles in which they work, and the wonderful manner in which they succeed in catching the spirit of it,—that spirit that gives their work most of its charm. This is the way, and the only way, a student can start on his studies. And therefore I think the Association rightly limits the period of the buildings to be studied by her Travelling Students to those erected prior to the eighteenth century.

But still we cannot shut our eyes to the fact that the precedents for design are sought in contemporary work, and, whether we like it or not, the practice is on the increase, owing, in a great measure, to the number of illustrations that are published. And this being so, it becomes a question whether we should not honestly admit the fact and do our best to train our powers of analysis and criticism so that the selection shall at least be of the best examples. It would not be difficult with many a modern design by our best architects to produce the old examples on which they were based. A careful comparison of the original with the translation would show how much the master mind had used of the original, and how much was his own; and the process of analysis could go further: the translation might be from

an original stone or brick treatment into terra-cotta, and to trace how the master had handled the detail so as to suit the new material, and stamp at the same time his own personality on the work, would be most excellent study; or, in other ways, how the nineteenth century requirements were made to modify the original expression. It might, then, be a useful exercise for us to take the old example and try our "prentice hands at a similar translation. I think, then, we should all acknowledge that the experience gained by the study of how a master workman had handled the subject before us would be of the greatest use in our own attempt. What we want is a careful training in analysis, so that we can learn to know what is good and what is bad in modern design. Then the visits made to modern buildings would be greatly increased in instruction and interest. But this power of discrimination can only be the result of careful training, and students should certainly not attempt to study modern work until they have gone through a proper elementary course in the purer styles. I am anxious not to be misunderstood. I do not for a moment propose the study of modern work for our younger students, or to in any way take the place of a careful study of old work by measurement, or sketching, or the study of all the valuable literature connected with old examples. But what I do lay stress on is that the work that is going on around us, and which is so abundantly illustrated, cannot fail to have a vast influence on our own work. We have here principles of design and pleasing forms of art all ready to our hand, and we should be more than human if we were in all cases able to resist the temptation to taste and handle the forbidden fruit.

It is in order to settle the proper position which the study of contemporary work should occupy in the education of our young practitioners that I venture to make the following suggestion, namely, to form a modern side in the Association which shall be for those members who have passed through the present more or less archaeological studies; and the first step that should be taken for the formation of this should be the institution of a common room, open every evening, where all the members might come in contact—the young students using it for a waiting-room till their classes were held, and the men of the professional topics commonly called "talking shop." It should be with a view of talking shop that they should congregate.

Without having any formal papers read or forms of discussion, certain evenings might be set apart for talking over subjects previously agreed upon, such as, for instance, one evening a month might be devoted to discussing the illustrations published in the professional press. But I am anxious to avoid formulating any programme, because I want this to be a common room and nothing more, where a member might be sure of finding another member willing, aye, more than willing, eager, to talk shop. I'm a great believer in talking shop, circumstance and place being appropriate. Then, in connexion with this modern division, we ought to have an annual exhibition of illustrations of buildings actually erected not only in the United Kingdom, but all over the world. This would not be difficult if photographs had, as I venture to suggest they should, a prominent position; but these photographs should be accompanied in all cases by sufficient working drawings to thoroughly explain the principles of design in the buildings. These illustrations should be arranged in such a manner as to contrast the buildings designed for similar purposes, and in such order that they may be intelligently studied and compared with one another. This exhibition could, I think, without very great difficulty, be made a much more complete exponent of our modern art than the Architectural Room at the Royal Academy at present is.

The object of this collection, as I would suggest, should be to show the profession what is being done at the present time, year by year, to meet the architectural requirements of the age. It may be urged that the professional press does this sufficiently fully to obviate the necessity of a special exhibition. I am perfectly ready to acknowledge the wonderful profusion and beauty of their illustrations, and, for the purposes for which I propose this exhibition, the mere arranging of these illustrations in due order would go far to meet the purposes for which I suggest it. The Royal Institute would, I venture to hope, co-operate with the Association to make this exhibition as compre-

hensive as possible. Whether the public would be induced to take an interest in it or not, I think, is of little consequence; I only propose it as an instruction to the profession; but with the increased interest that is being taken in architectural matters, I think it not at all unlikely that the public would in time be found to take it up. During the exhibition each section should form the subject of one evening's discussion, and, if possible, not only the designs, but the material and points in the construction, should be taken into consideration. Again, the designs submitted for the great public competitions, such as the Admiralty and War Offices, the Liverpool Cathedral, and the Imperial Institute, should each in turn also form the subject of discussion in this common room; difficulties in points of practice met with by any of the members could well be discussed, and good advice obtained; in short, everything of interest to the profession should be considered at one time or another by these "friends in council." By this means I should hope to form a definite professional opinion on the actual work that is being done, which may have an influence on the work of the individual member. This modern division should also form an excellent opportunity for those of our members who have passed the age when they can readily avail themselves of the classes, but who are anxious to prepare for the Obligatory Examination. This could be easily done by the formation of a reading party, in which a definite course of preparation for the Examination could be arranged, which might include time sketch designing as a practice for the design day in the examination.

Ours is essentially a students' society, and the whole of the work (or nearly so) now done is it is for the benefit of those who are preparing themselves for independent practice; but I contend that the objects of this Association are by no means limited to this, and I believe that the free expression of opinion on questions of design and construction would be of very considerable educational value to everybody concerned. In these latter days, with the increase of liberty in design, there is not a little tendency to licence, and doubtless there would be plenty of doubtful examples for the censors to draw their moral lessons from, and thus curb the ardour of the younger men and lead them into the direction of more consistent styles. And the fact of pointing out these things would, I trust, have an equally good effect on the censors, who might reflect that some of their own work might come under like condemnation. I know of no place where similar opportunities for the exchange of professional opinion can be enjoyed on so large a scale as would be possible if this scheme were carried out; but the general idea has been carried on successfully in several small societies which exist among our members, and I am sanguine enough to hope that it would succeed on the larger scale.

Although the number of old members who continue their subscriptions long after they have ceased to derive any benefit from the Association is a very gratifying feature, it has always been a matter of regret to me that the majority of our members so quickly drop out of touch with the working of it as soon as they have passed through the Classes, and it would be most important step in advance if those members would revive their interest in the work of the Association. The sacrifice of time need not be very alarming, say one evening a month, and no pledge given, but just to drop in for an hour or two, and in a friendly chat help forward the matter under discussion, or to express an opinion either of commendation or the reverse on what is public property and open for criticism. In this way I feel sure a large amount of good work could be done, and it would be a great help to our younger men to have some guidance in the formation of their opinions on questions of design. And if you had to listen to some crude talk or advanced opinion from the younger men, it would do you but little harm—nay, I make bold to say, it might do you some good. Greater enthusiasm and earnestness on purpose, as far as my experience goes, are rarely to be met with than amongst our members, and the kind attention with which they always receive any endeavour to help them in their work more than repays any trouble they may involve.

But I have dwelt, I am afraid, too much on this attempt to re-introduce an old and most important feature of the Association in its early days, and will now only just refer to our scheme for the affiliation of all the student architectural



societies with our Association, as this subject will have to be brought before another ordinary meeting during this session, in accordance with the rules which were passed a short time ago. I may, however, be allowed to briefly mention the most important features in the scheme. The first is that as, in accordance with the new Charter of the Royal Institute of British Architects, this Association will have a recognised representative on the Council, this affiliation scheme will, if successfully carried out, constitute him the representative of all the architectural student members belonging to the affiliated societies; and in any matters connected with the obligatory Examination it is most important that they should be directly represented on the Council. Secondly, as most of the Classes carried on by these societies are modelled more or less directly on our own classes, valuable exchanges of information and advice can be made. In some cases the Classes, as is now the case with the Birmingham Association, can make arrangements for interworking. And the repetition of some of our courses of lectures to the provincial societies, and the extension of the use of the loan library, are most important benefits that will be derived from the scheme.

With regard to the work of the Association's Classes, some slight alterations have been made in the Elementary Classes of Design which is hoped will improve and increase the benefits, already very great, which are to be derived from these Classes.

No alteration will be made in the Class of Design, the result of the working of last session being considered satisfactory. But during the present session an attempt will be made to improve the working of those Classes in which paper work is submitted. Under the present arrangement the Visitors to these Classes have to deal with some thirty to forty papers, each of which consists of from fifteen to twenty pages of foolscap. The mere reading, correcting, and marking of these papers is no slight task, and to attempt to point out to each individual student the errors in his paper at the Class meeting, or to question him as to answers which require explanation on his part, as well as to point out to the Class specimens of the best answers, is almost impossible, and makes the meetings very long, and sometimes slightly tedious. Among the fresh facilities for study, it has been found desirable to start this year a class for the study of natural philosophy, which will form an introductory course to the class of graphic statics. The new course of lectures on geology has a very close connexion with the science of building, and those students who make their first acquaintance with this most fascinating of all the sciences will find in Mr. Locke an able and lucid exponent, while those who already have some knowledge of the subject will, I venture to think, find it treated from a standpoint that probably they have not previously regarded it, and both will, I hope and trust, be led to make practical geology one of their constant pursuits, as the opportunities which they as architects have of following up this study are very great. It is to be hoped that the students this session will not neglect their opportunities as they did last year with regard to joining the Land Surveying Class in sufficient numbers to enable the class to be formed. I would also call the especial attention of the members to the new arrangements for the study of water-colour, which should ensure the success of the Water-Colour Class during the vacation, and I will now conclude with a few remarks to those students who are about to work in the classes.

I take it for granted, gentlemen (and I am sure you do yourselves), that you are all greatly gifted (laughter), and have each and every one a glorious and successful career before you; but of this much I am sure, that the matter is very much in your own hands. Remember that the very magnitude of your talents implies great responsibilities, that genius is said to be only another word for capacity for hard work, and that it is only those who persevere and work to the end who really show and make good use of the talents they possess.

Year by year our Class reports record a falling off in the attendances at the Class meetings towards the end of the session. This can only be attributed to one cause, that the students are disappointed in themselves and find that they are not the geniuses they thought they were, or they would endure to the end. But I hope I am not speaking to any such to-night; and if I am, I would still urge those who feel this disappointment to work steadily on, be-

cause you have been mistaken and find that your talents were hidden treasures, only to be found by painful search. In this Association every one is on a perfect equality, and your position in it will be entirely of your own making, and depend on your abilities and personal qualities, without regard to your rank, position, or money.

In working in the Classes you cultivate habits of self-denial, unselfishness, self-reliance, and industry, which will make your life work easier, and in the end you will find these habits a very good substitute for genius. The prize can only be gained by one; the benefit of working in the Class can be shared by all. By all means strive for the first place, but do not leave off working because you see you have no chance for it.

Cultivate by all possible means the artistic side of the profession, but do not be led into the error of despising the practical and constructive side. If, for instance, you have to leave the writing of your specification to some one else, I am afraid the building will hardly realise your own ideal. No artist was ever spoilt by studying construction, and as facilities are now afforded for you to know the why and wherefore of each formula you use, I would strongly urge you to follow up the study at least so far as to be able to build up some of the simpler formulae for yourselves.

Take every opportunity the Association affords of making new acquaintances among your fellow students; they may, and often do, ripen into useful and valuable friendships in after years; but my object in this is for present purposes. One of the most important accomplishments in an architect is to be a good judge of character, and in the Association you have as varied a collection of types as you are likely to meet anywhere.

I said at the commencement that our system of instruction had very definite limits and possibilities. The value of receiving tested and approved information is very great, but at the same time it is necessarily condensed and brief. Do not therefore think, when you have listened to all the lectures and passed through all the Classes, that your salad days are ended, and in the ripeness of your powers you are equal to any emergency. The lectures and Classes are at best only hints and outlines that you must fill in for yourselves.

In London the opportunities for doing this are without rival anywhere, and full particulars where these are to be found are set out at the end of the "Brown Book." The Classes are only intended to whet your appetite for more direct and scientific knowledge.

Mr. Aston Webb, in moving a vote of thanks to Mr. Appleton, complimented him on his excellent address, and congratulated him on occupying the Presidential chair of the Association (applause). The members recognised Mr. Appleton first and foremost as an Association man, who had worked all through its Classes, and had done more, perhaps, than any one to advance its usefulness. Therefore they looked upon their new President as the right man in the right place (applause). Moreover, they recognised in Mr. Appleton an architect of ability, and one who had occupied a public post for some time with honour to himself and satisfaction to those who employed him. Besides all this, the members looked upon Mr. Appleton as "a rattling good fellow" (cheers). Within the last year or two Mr. Appleton had started several schemes, all of which had been of the greatest possible advantage to the Association; and now he had sprung another yet upon them. Underlying the chief points of the address was the new scheme, which, doubtless, they would all be prepared to enter into most heartily. Some letters had lately appeared on the matter of plagiarism in architecture, and two gentlemen had got rather warm over discussing whether modern work, or the work of men who had gone, should be considered. One gentleman contended that the South Kensington rule,—"Nothing to be copied until a man is dead,"—was the right one (laughter). That looked all right in the galleries at South Kensington; but he could not himself see why a man's work should necessarily become a special object of study as soon as he, unfortunately, was gone. He preferred Mr. Appleton's suggestion, that they should meet and discuss work actually being done at the present time. The attempt to illustrate architecture by designs had often been tried, and Mr. Appleton had suggested that it should be tried once again. He quite agreed that it would be a most desirable thing

to do. The Architectural Exhibition, if not altogether a success, was certainly not a failure, and the Exhibition of Arts and Crafts at the present time seemed very nearly allied to an architectural exhibition. If its scope could be extended a little further, and made to embrace something more of architectural design, it would be an exhibition which, while it gave all the facilities they required, would also interest the public,—a necessity if it was to be anything like a success. As to the question of whether they ought not to copy modern work, or be affected by it, he doubted if there was a man in that room who was in practice, who could lay his hand on his heart and affirm that his work had not been influenced by Mr. Norman Shaw. If there was such a man present, he would be inclined to say it would have been better for him if he had allowed his work to be so influenced (laughter). The great result of any man's work should surely be, not only that he had put up a beautiful building, but that he had influenced and helped others to do so. The chief use of a common-room, such as had been suggested, would be to discuss these matters. If each one could only produce one or two small points of beauty in their designs, it would lead on in time to an architectural style which, he believed, would be worthy of the present century (applause).

Mr. John Slater, B.A., in seconding the motion, remarked that they could hardly have listened to a more practical address, or one better fitted for the members of the Association. Mr. Appleton had certainly hit upon a new means of usefulness for their Association. It was impossible, he believed, to find an architect who, if he had to put up one of his buildings again, would not see where he could alter and improve it in some manner, and it would be most useful to have a common room where he could discuss difficulties with his brethren. The modern ways of building were so different from those adopted by the ancients that it was impossible to go on copying slavishly. It would be an admirable thing if they could have such an exhibition as had been hinted at annually, but he could foresee considerable difficulty in the way. One of the chief styles or methods of building he would like to see year by year exhibited would be those of America, because the leading architects of that country seemed to have cut themselves more adrift from tradition than those of any other nation. The late Mr. H. H. Richardson, for example, was one of the most original architects of this or of any other age, and those who had seen photographs and drawings of his buildings must have been marvellously struck with the innate genius of the man in adapting old forms to new requirements (applause).

Mr. E. J. Tarver said it was often difficult to get people to believe that there was a modern style, though there were hundreds of important buildings which it was a pleasure to look at, and which were obviously the work of the present day. If, then, they could get people to appreciate contemporary architecture,—he would not say exactly to admire it,—they would have struck a nail into the coffin of that sneer they were always met with in speaking about the modern style (applause).

Mr. C. R. Pink considered that the address was just what was wanted at the present time. He certainly agreed with Mr. Tarver that there was a modern architecture and a modern style. This year he had studied a church not many miles from Lichfield, and he considered that, within its scope and limits, it was as fine a church as he had seen of any period.

Mr. Cole A. Adams believed that Mr. Appleton's suggestion for the study of modern work would be heartily taken up. The suggestion for a common-room, or practically that club life should be added to the Association, was also an admirable one. He bore testimony to the labour involved in the production of the "Brown Book," and thought the time could not be far distant when some paid assistance would have to be forthcoming to meet some of the routine work which now fell upon the honorary secretaries. The cost of this and of other advantages would, however, he believed, have to be met by raising the subscription.

The vote of thanks was then put to the meeting, and carried by acclamation.

The President, in replying, said he would strive to make the proposed common-room a success, if the older men would only come forward and help. He supposed the members had seen a letter in that week's *Builder*,\* which

\* "A Residential College for Architectural Students." See p. 287, ante.





Cox, of Hackney, the builder of Nos. 395 and 397.

The lifts, passenger and luggage, were supplied by Messrs. Smith & Stevens.

The work has been carried out from the designs of Messrs. T. Chatfield Clarke & Son and under their direct supervision.

#### RESIDENCE AT SUTTON, SURREY.

THE materials of which this house is built are local red bricks and hanging-tiles, and Broseley roofing-tiles. The vertical tiling is fixed to brickwork, with breeze concrete fixing blocks on the principle recommended by Mr. Ralph Nevill. The half-timber work is yellow fir, left rough from the saw, and Stockholms tarred.

The plan is arranged to make the dining-room 12 ft. high, and the drawing-room and study 10 ft. high.

The morning-room is placed by the second staircase, to be used in connexion with the nurseries, so as to allow the children access to the garden without passing through the hall. The nurseries are over the kitchen and scullery, and are served with a lift. There are five bedrooms and a bath-room on the first floor. The work is being carried out by Mr. J. B. Potter of High-street, Sutton, Surrey, from the designs of Mr. Herbert D. Appleton, F.R.I.B.A.

#### STABLES AND COTTAGES, HEATH HOUSE, BANSTEAD.

THE stables are built of Epsom red brick and Ewell hanging-tiles, with Broseley roofing-tiles, the internal facing of the stables being Cliff's salt-glazed and white-glazed bricks. The ceiling of the stables is covered with Willington enamelled iron plates. The stable-fittings are from the St. Pancras Iron Company. The coachmen's rooms are over the harness-room and coach-house.

The gardeners' cottages are built with the same materials, and have three bedrooms each on the first floor.

The work is being carried out by Mr. E. J. Burdett, of Clifton-road, Wallington, Surrey, from the designs of Mr. Herbert D. Appleton, F.R.I.B.A.

#### COMPETITIONS.

**Manse at Kintford.**—The trustees of the Congregational Church have decided to erect a residence for their minister on a site adjoining their present church. As a result of a limited competition amongst architects, the design submitted by Mr. J. H. Burton, of Ashton-under-Lyne, have been adopted.

**Sculpture for Portsmouth Town-hall.**—In a limited competition for designs for filling the tympanum of the portico of the Portsmouth Town-hall with sculpture, the sketch sent in by Mr. H. F. Margetson, of Bristol and Chelsea, has been accepted by the Corporation. The estimated cost is 1,380*l*.

**The Surveyors' Institution.**—The first ordinary general meeting of this Institution for session 1888-89, will be held on Monday, November 12, when the President, Mr. E. F. Square, will open the session with an address. Chair to be taken at eight o'clock. It is announced that those proposing to enter their names for the Students' Preliminary Examination, to be held on the 22nd and 23rd of January, 1889, must intimate their intention to the Secretary before the last day of November. It is proposed to examine candidates from the counties of Lancashire, Cheshire, Yorkshire, Durham, Cumberland, Westmoreland, and Northumberland, at Manchester. Candidates from other counties in England and Wales will be examined in London. Students eligible for the Proficiency Examination (which will commence on the 8th of April next) must give notice of the sub-division in which they elect to be examined, not later than the last day of November. Examinations qualifying for the classes of Professional Associates and Fellows will also commence on the 8th of April next. Names of applicants for these latter examinations to be sent in before the 12th of January next. All particulars as to days, subjects, and course of examination will be forwarded on application to the Secretary. Candidates for the Professional Examinations will be examined in London only.

deserved careful consideration on the part of those who were up in London for limited periods, and referred to the desirability of forming a sort of common club dwelling. The proceedings then terminated.

barbarous Byzantine examples in coarse stone to be found in some of the more out-of-the-way corners.

#### KETTERING CHURCH, NORTHANTS.

THIS reproduction of a capital measured drawing by Mr. James Hardman will be of interest in connection with the article, in another part of this number, on the Weldon stone district, and is there referred to.

#### Illustrations.

##### CAPITALS AND WELL-CURBS, VENICE

SINCE the appearance of Mr. Ruskin's "Stones of Venice," the series of capitals of the lower arcade of the Doge's Palace have always been regarded with exceptional interest. We think their artistic value is exaggerated in that book, as is Mr. Ruskin's way when he admires anything. The foliage is not in all cases equally interesting and graceful, and the figures are sometimes coarse, and sometimes meaningless. Nevertheless, as a whole they are beautiful things, and we think the four we give to day will be acceptable to our readers. The figures in the top left-hand cap represent the virtues, of which "Largitas" occupies the front side. The meaning of the figures in the next capital is uncertain: those in the lower left-hand one are apparently sculptors and architects; some are crowned. The last capital is that at the "Judgment Angle," the three subjects on the sides shown in the print are the Emperor Trajan and the widow in the middle, Moses receiving the law, and Justice enthroned.

The two well-curbs show how this very prosaic necessary adjunct of life in Venice was made a field for the sculptors' art at two different epochs. The imagination of all travellers to Venice is struck by these curbs in every courtyard, from the magnificent bronze Renaissance ones at the Ducal Palace, to the half-

##### SHOPS AND RESIDENTIAL CHAMBERS, OXFORD-STREET.

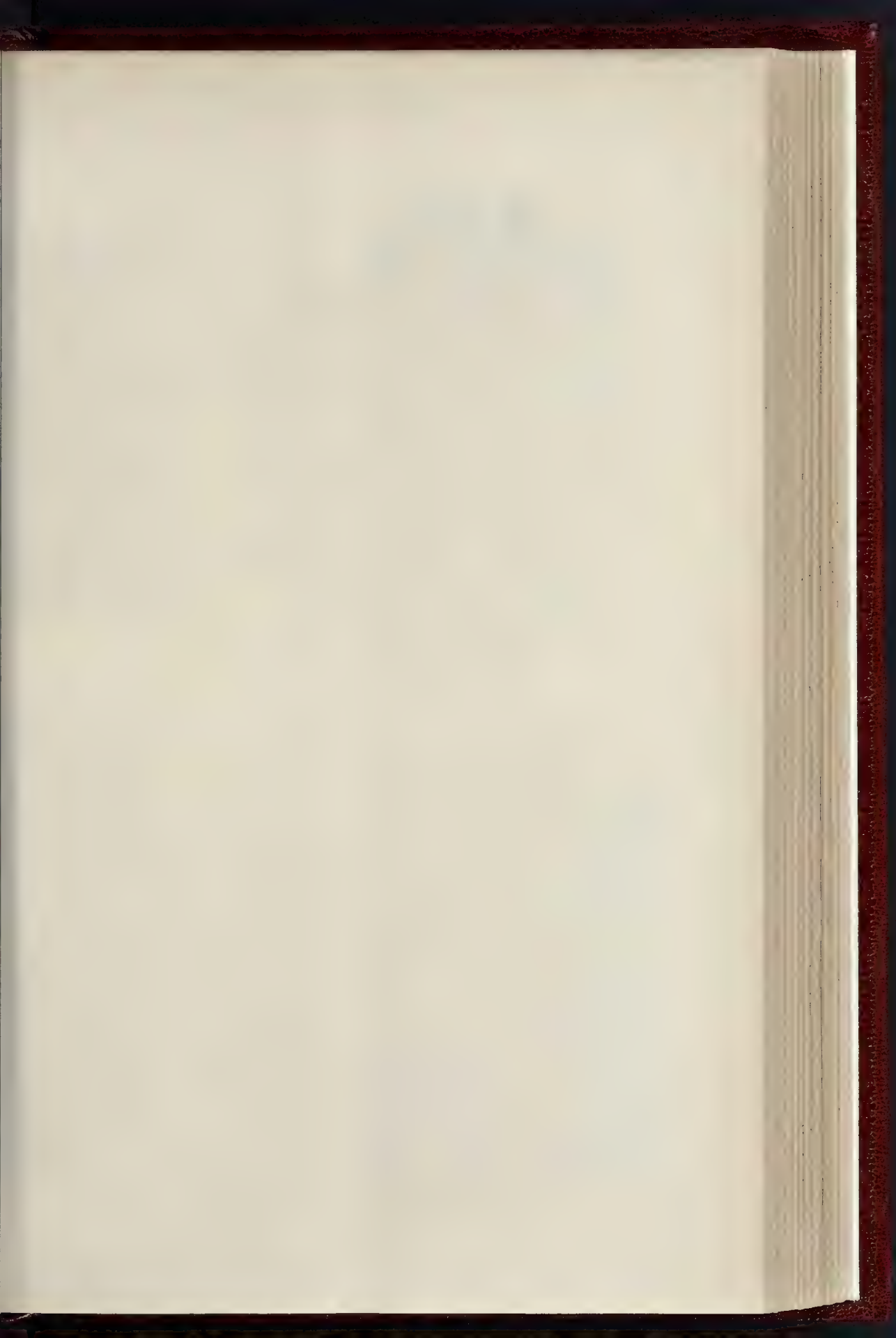
THESE premises, which are now rapidly approaching completion, form part of a considerable amount of reconstruction upon the estate of the Duke of Westminster.

The basement and ground-floors are devoted to shops, and are separated by fire-proof floors from the flats and chambers above. The eastern block, as will be seen by a reference to the plan, is constructed with one set of rooms, having two sitting-rooms, bed-rooms, kitchen, and servants' accommodation, &c., upon each floor; while the western block is divided up for bachelor suites of two rooms (with bath, &c., to each set), with a common kitchen on the south floor.

The fronts are in red gauged brick (obtained from Lawrence, of Bracknell), with Ancaster stone dressings, with green slating, the style of the buildings being French Renaissance, with high dormers, projecting bay, and corner turret. The height of the structure, and the necessity of keeping unobstructed the areas of the shops, entailed the use of a large quantity of iron, which was supplied by Messrs. M. T. Shaw & Sons, Messrs. Moreland & Son, and Messrs. Gimson, of Leicester.

Messrs. Laurence & Sons, of City-road, were the builders of Nos. 385 to 393; and Mr. Chas.

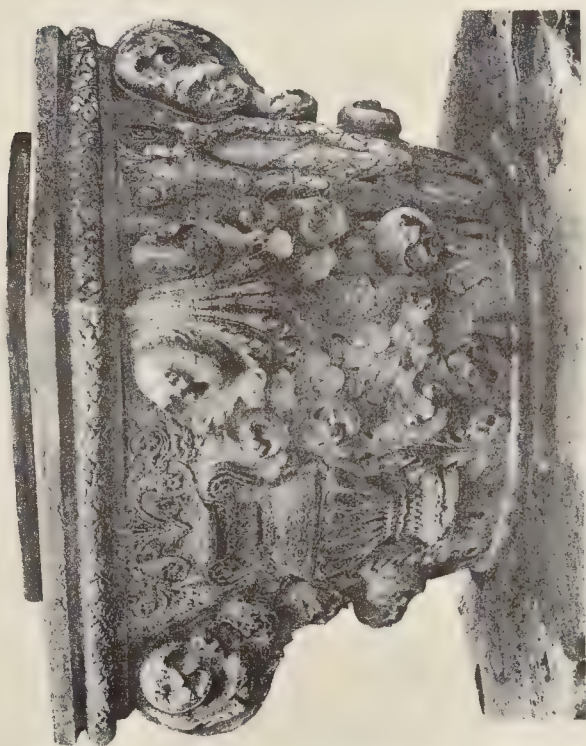




THE BUILDER, OCTOBER 27, 1898.



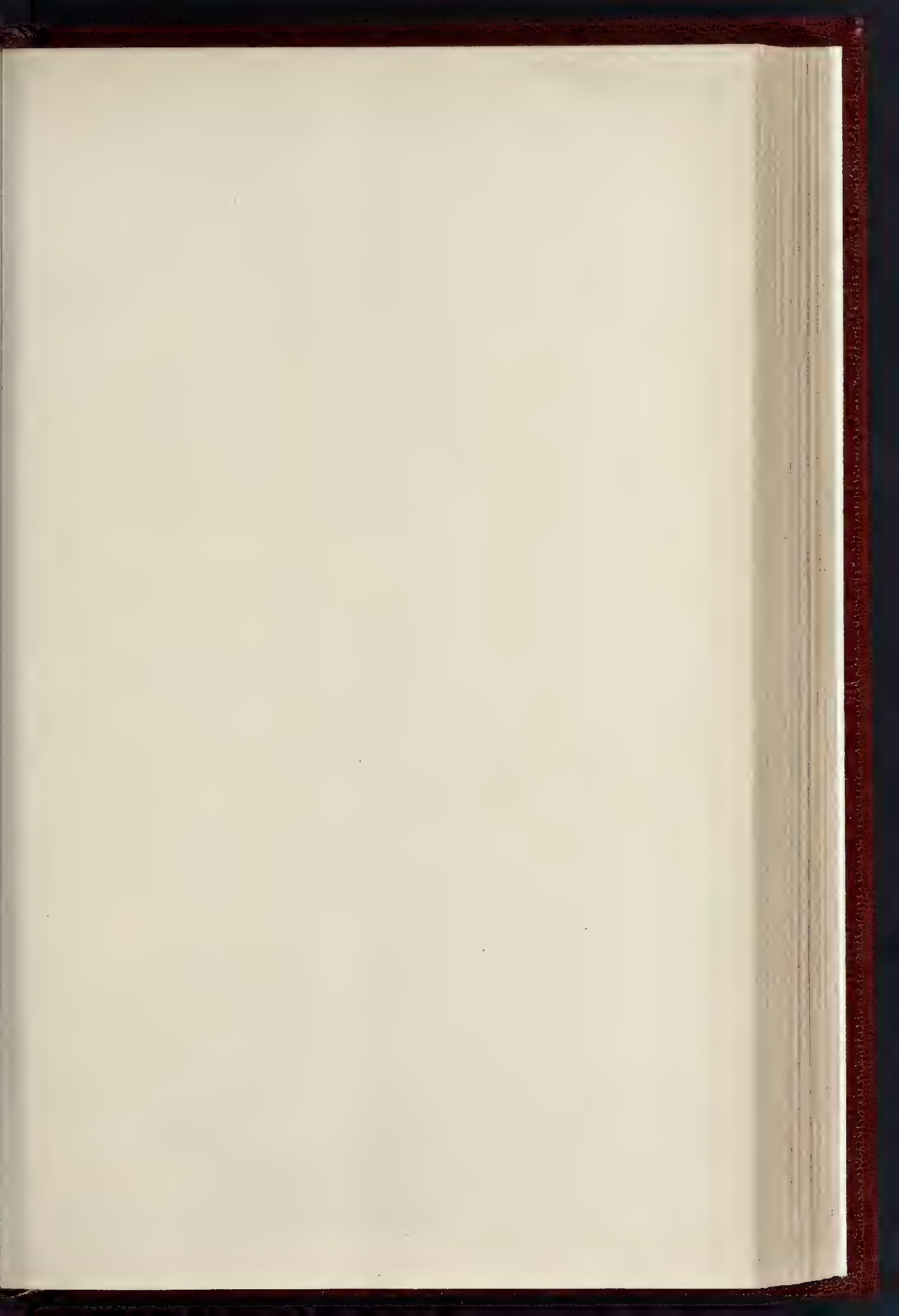




CAPS FROM THE DUCAL PALACE, AND TWO WELL-CURBS: VENICE (FROM PHOTOGRAPHS.)







THE BUILDER, OCTOBER 27 1883

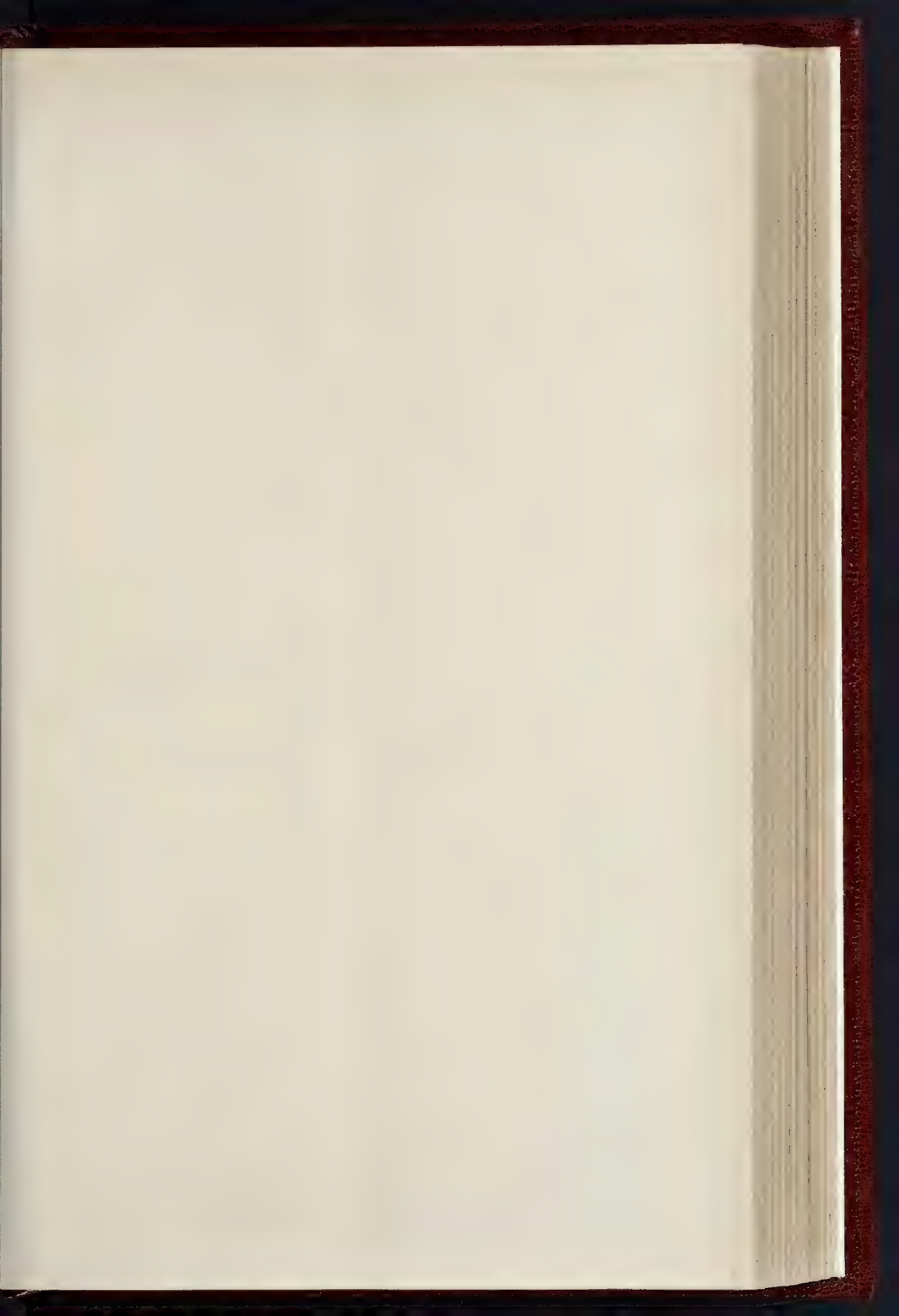




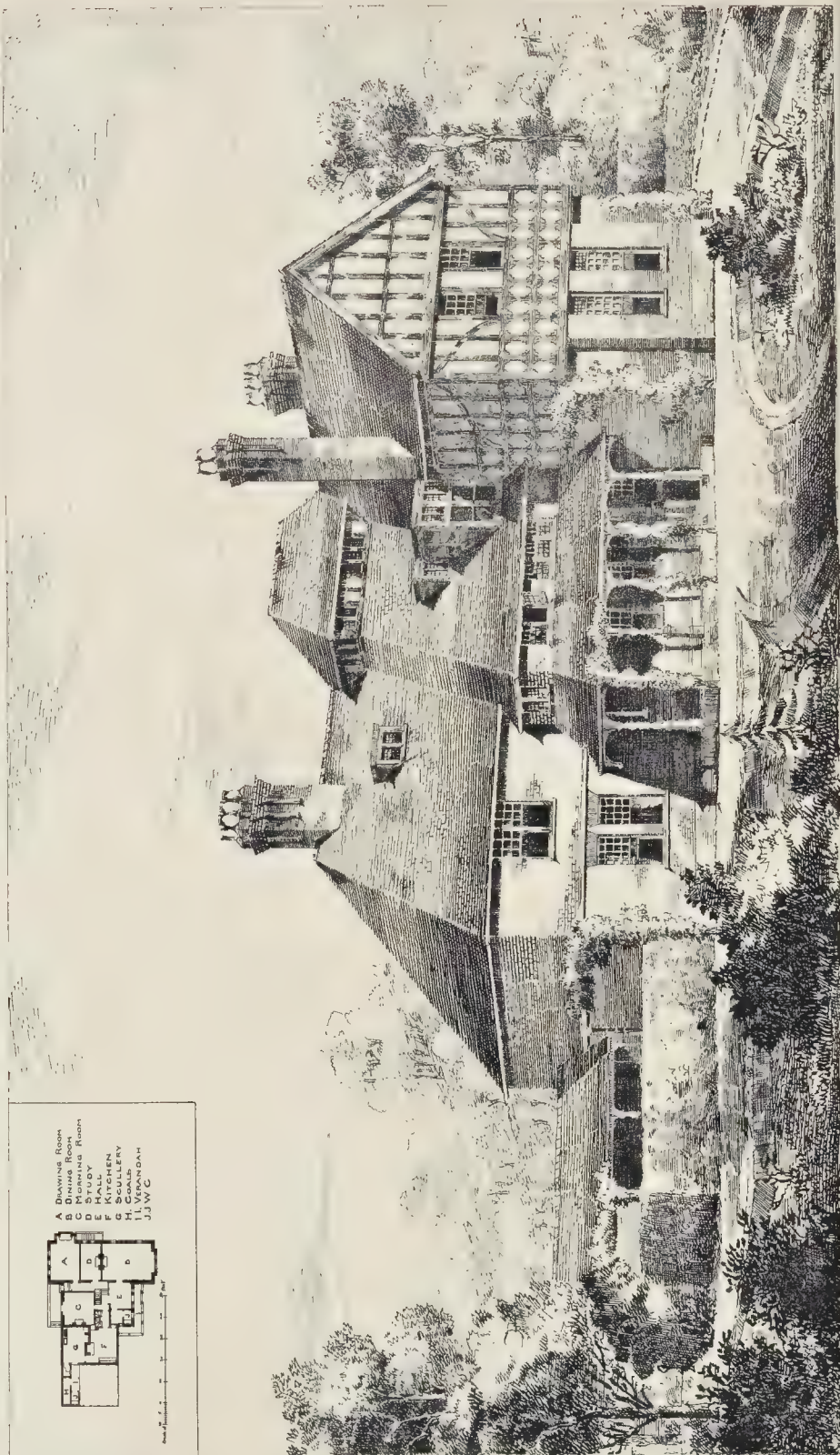




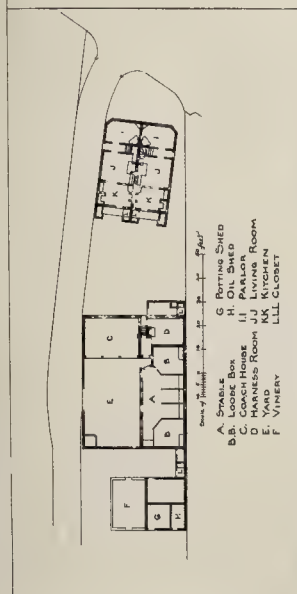




THE BUILDER, OCTOBER 27, 1888.



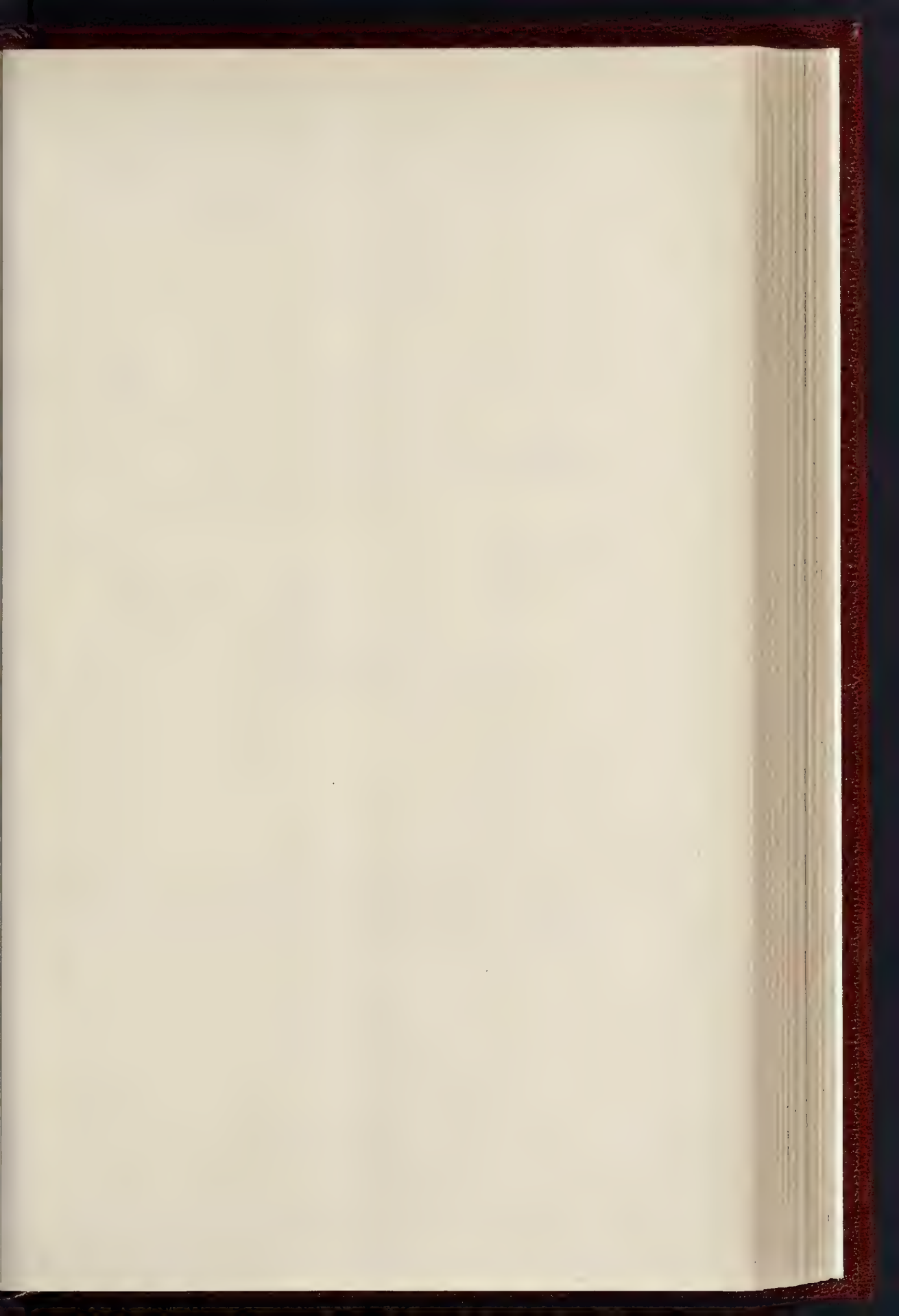




STABLE AND COTTAGES, HEATH HOUSE, BANSTEAD, SURREY.—MR. HERBERT D. APPLETON, F.R.I.B.A., ARCHITECT.



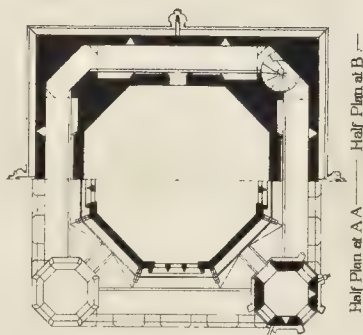




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KETTERING CHURCH. NORTHANTS.

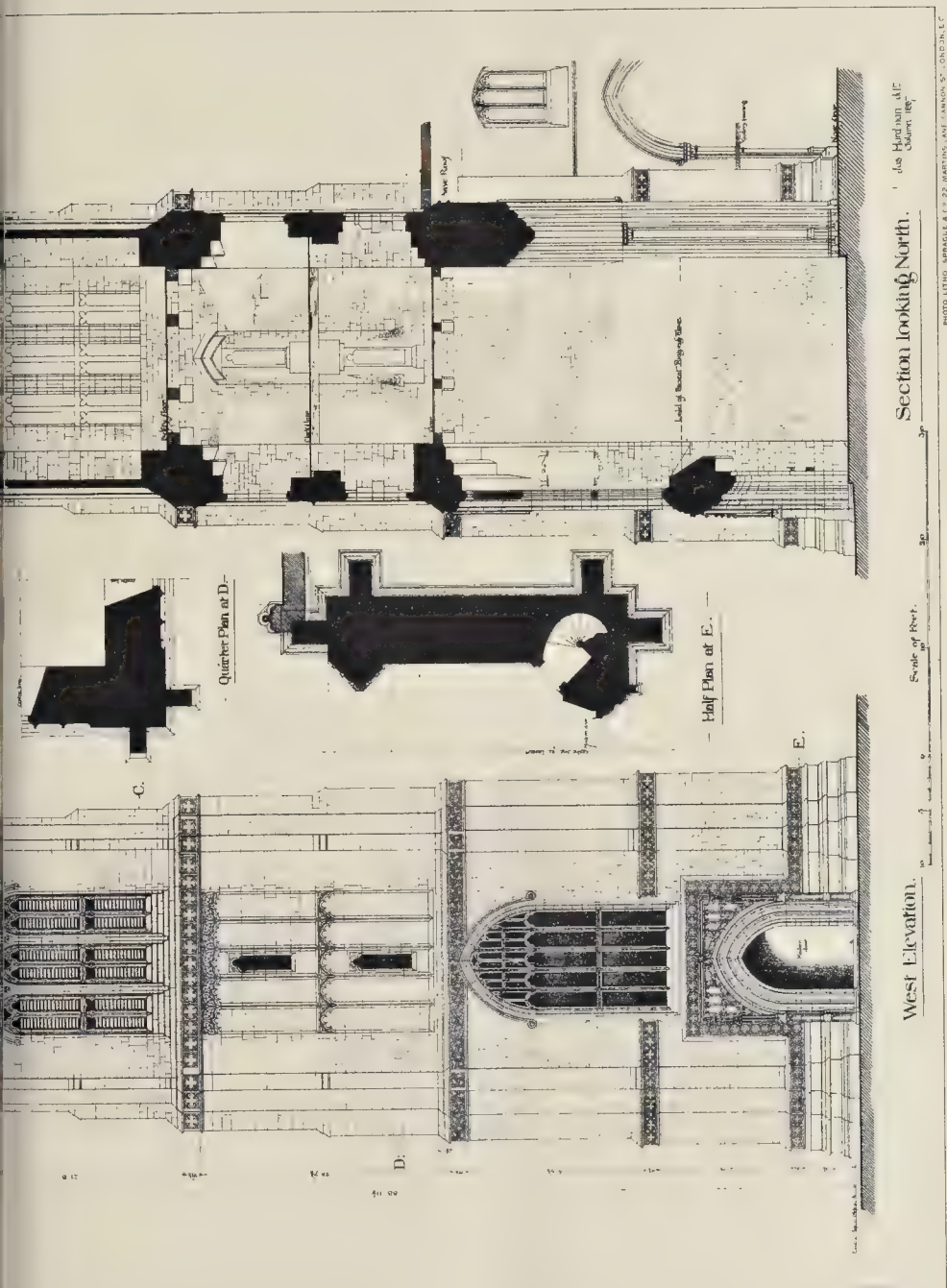
MEASURED DRAWING  
OF  
TOWER AND SPIRE.



Half Plan of A A — Half Plan of B B —

106 The whole of "over 10 miles" from actual measurements taken by us, is sufficiently used (and made for it) page 21. 1887









# HANSARDS OF THE STEEL-YARD.

ING events at Hamburg remind us of the ment which the favoured Eastlings once in our midst. On June 15, 1881, after a able debate, the House of Burgesses at urg adopted, by 106 to 46 votes, the resolution for the inclusion of that city the Zollverein, or Customs Union of the n Empire. On Monday, October 15 cur-amburg ceased to be a free port as ing to the ancient Hanseatic League, and w and vast bonded warehouses were. Within a few days Bremen will, own free accord, undergo a similar

ack, founded in the twelfth century, and urg, by Charles the Great, in the ninth, the earliest members of the League which eved to have originated, for common and intercourse, at the end of the n or beginning of the thirteenth century. o follow its commercial history were d the scope of our journal, we will only e that along the Baltic shores the e exercised a dominion like to that of over the Adriatic. Consisting of four erate circles, at head whereof were, elively, Lübeck, Brunswick, Dantzic, and e, it enjoyed its apogee of credit and e, during the fourteenth and fifteenth e. Its foreign commerce embraced all that of Poland, Russia, Denmark, a, and Scandinavia, in exchange for which security in business and extended the of civilisation. The principal fair was t Bruges, where as early as 1318 we read arrival of five large galleasses from e. Novogorod, the chief emporium orth-eastern Europe, never recovered the vengeful massacre by Ivan IV. in e Easterlings, or King's men, came r ships to Billingsgate in times remote, eured Æthelred's protection. By the nth century, and known as the Hansards, d obtained a settlement in London, and ng term exercised the exclusive right of ing wheat. Our kings, Henry III. and d I., enlarged their privileges; as did also rporation, in consideration for the repair maintenance of Bishop's Gate, and an aking to defend the City when assailed, repaired the gate in 1282, and in 1479 sup-unds for its rebuilding. So mightily did eveal, that to adjust pretensions which ere quite ready to enforce with the Edward IV. assigned to these merchants a permanent property on the site ildings which they then occupied at e or Stikel, Hof, in Upper Thames-street; er with certain wharves and other mes- at Boston and at Lynn. As modified by overeigns, these and other liberties were abolished by Queen Elizabeth, who, in a nation of February 28, 1598, summarily hem quit her kingdom.

bird's-eye view of London, contained in and Hogenberg's "Civitates Orbis am" (1572), the "Stillards," with its and warehouses, is clearly drawn and e. The style of Steelyard is, in all likeli-erived from the circumstance that hither, wgate Wharf, at foot of Dowgate-hill a little westwards of Shrewsbury or ey-in, had been carried the king's ng-beam, or yard, from East-Chepe.\* Of equent history there is little more to be en what may be read in Cunningham's t-book of London," to the effect that with-ear of the Hansards' Ejectionment the Lord was called upon to surrender the es, it being designed to appropriate e for the landing and warehousing of naval e. As elsewhere, so in London, the mer- themselves formed a quite separate com-ny of their own, dining at a common table, nding celibate lives. Their former habi- long marked by the Steel-yard stairs, wept away at the building of the South- n Railway terminus in Cannon-street. ul, however, of their former holding and ities in London, they caused to be made burg, for the parish church of All Hallows eat, the fine oaken screen (supposed to en given temp. Anne), whereof an en- g by T. Turnbull, after R. W. Billings, ublished by the late Mr. George Godwin, "Churches of London" (1839).

re is also a Steel-yard in New-street, to the east of pital, in which is a tavern by sign of the "Ship vel."

# MANCHESTER SHIP CANAL WORKS.

OWING to the skill and energy of the contractor and his staff, this gigantic undertaking appears to be making very rapid progress. On the occasion of a recent visit, we were much struck by the magnitude and completeness of the plant employed, a brief description of which may be of interest to our readers. The greatest progress appears to have been made at Eastham, where nearly two million cubic yards of earth have been removed and used, chiefly in levelling the shore. No great engineering difficulties have as yet been encountered, either here or on the other sections. The excavations consist chiefly of soft earth, boulder clay, and red sandstone, and it is proposed to use some half million tons of this latter for facing the canal. The whole length of the canal, 35½ miles, is divided into nine sections, each section having a complete engineering staff, plant, and band of workmen. On each section, mission-rooms and hospital accommodation have been erected by the contractor, who appears to have amply provided for the comfort of his work-people, of whom there are nearly 12,000, on this and the Bridgewater Canal undertaking. The basin, which is the site for the locks at Eastham, is well forward, and we understand it is proposed to erect three locks abreast of each other, the largest measuring 600 ft. by 80 ft.

The plant consists of some 98 locomotives, 3,221 tipping wagons, 51 steam navvies, 49 steam cranes, and 104 pumping and other engines, besides numerous smaller machines.

The largest number of navvies or steam-diggers are of the Dunbar and Ruston type, described and illustrated in the *Builder* of August 5, 1885. Several of these operate two-yard buckets, and are capable of placing, with two movements of the machine, some four tons of material into the trucks. We were informed that one of these machines running throughout the day, and operated by two gangs of men, had filled no fewer than 640 trucks; or, in other words, had excavated some 2,500 tons of material, which must be considered a really remarkable performance.

The French excavator manufactured by Messrs. Boulet & Cie., of Paris, has attracted a good deal of attention, and appears to do excellent work. Its general description is as follows:—Main framing of the machine of wrought iron, 30 ft. long, and with a top tumbler-shaft 18 ft. above the level of the rails. It travels on three lines of rails laid on 9 ft. sleepers, the front rails being 1 ft. 8 in. and the inner ones 4 ft. 8½ in. apart. On these rails rest ten wheels, four of which are geared for travelling, the motion being given through the medium of a pitched chain. The horns or ladder project from the front, and the jib is pivotted from the top tumbler and raised or lowered by a chain over the horns. The boiler is of the multitubular type, 21 ft. long by 4 ft. diameter, and with a single flue—working pressure 140 lbs. to the square inch. The main driving engines are a pair of diagonal non-condensing engines, cylinders 9½ in. diameter by 19½ in. stroke, and make 85 revolutions per minute. The jib is raised and lowered and the excavator traversed by a small pair of engines, cylinders 6 in. diameter by 6½ in. stroke. The trucks to be filled are arranged to run on rails at the back of the machine, and the excavator shoot delivers into these. Five men operate the machine, viz., engine-driver, fireman, bucket-man, and two men to attend to the shoots. In positions where there is ample suitable material this machine should answer well, and we were informed that in a very moderate depth it has filled some 590 trucks in a day of ten hours.

Several German excavators, constructed by the Lubek Machine Construction Company, are also at work. These are arranged with lateral traverse, and differ considerably in their method of working from the machines already noticed. They are mounted on three lines of rails fixed on the top of the slope, along which they gradually travel whilst working. The main frame of the machine is of wrought iron, from the front of which two horns, hinged at the foot, project, and between these is hung the jib along which the excavating buckets travel. The machine is mounted on sixteen wheels. The excavating buckets are made without backs, and are segments of a circle. When the machine is set in motion, these buckets are dragged up the face of the excavation, and discharge their contents as they pass over the top tumbler. The boiler is arranged to counterbalance the machine, and is a single-flued multitubular, 16 ft. long by 5 ft. diameter. A pair of engines,

9 in. cylinders by 13 in. strokes, are the motors. Four men are employed to work this excavator. The chief operations are controlled by the engine-driver, who has levers for stopping and starting the machine and buckets, and for regulating the depth of the cut taken by them. This latter is done by raising and lowering the jib. The machine is arranged to travel along the rails at a speed of about 12 ft. per minute, and the depth of the cut is regulated according to the hardness of the material, but under ordinary circumstances it is stated to be capable of loading about 430 4-yd. trucks in a day. The weight of this excavator is 60 tons.

A number of Whittaker's combined steam-crane and navvies are in use; they are arranged with a self-acting traverse on an ordinary 4 ft. 8½ in. railway gauge-rails, with outer wheels of 7 ft. 6 in. gauge. It is constructed chiefly after the fashion of an ordinary steam-crane, the dredging or excavating being done by a chain passing over the head of the jib. The bucket is attached to an adjustable quadrant fitted to the jib. The position of the quadrant can be raised or lowered as may be found necessary. A steam cylinder is hung in trunnions on the jib, and, through the medium of a pair of cranks, operates the quadrant to which the dredging-bucket is attached. The bucket can be readily advanced or retired against the face of the cutting, and should it come in contact with rock, and pressure exceeding five tons be put on it, it will retire automatically and pass round the obstruction. This is an ingenious arrangement, and in cuttings where the nature of the strata varies, should lessen the chance of breakage considerably. The weight of a ten-ton crane and dredger complete is only thirty-two tons, and the ready way in which these machines can be handled should bring them into more extended use.

The workings are lighted at certain points by electricity and by the "Wells light" (Wallwork & Wells' patents). The operation of this light is briefly as follows:—Suitable steel tanks are employed, and a hand-pump is screwed into the crown of the lamp, and charges it either with oil or air as may be required. The air in the tank is compressed to about 25 lbs. pressure to the square inch, and the lamp-burner is heated by burning a little oily waste in the cup. The admission valve is then opened, and the oil is forced up by the air pressure into the heated burner, and being converted into gas issues from the jet in a large flame. The heat of this flame passes continuously through the generating tubes, and converts the ascending oil into gas. For large canal, dock, and similar works this light should prove itself of service, as it gives a good light and requires little attention.

At various points the boulder clay is exposed; it is interspersed with pebbles, and this same strata is believed by Mr. Leader Williams—the Engineer to the Canal Works—to extend from Eastham to Nantwich, and thence onwards to the salt mines of the Severn and the Bristol Channel.

Clay suitable for brickmaking has also been met with, and this is being turned into bricks by the contractor at the rate of about 150,000 per week, and will be used in erecting the various warehouses and buildings necessary on the banks of the Canal.

Although up to the present no formidable engineering difficulties have been encountered, this will not be the case after the works have passed Barton, as the Bridgewater Canal crosses the line of the ship canal. We understand it is proposed, in carrying the Bridgewater Canal over, to try a very novel engineering experiment—viz., the employment of a swinging aqueduct. This plan is, we believe, unique in canal engineering, and although the work will necessarily be costly, we do not see any reason why it should not be successfully accomplished. A large weir is also to be formed in the river, which will be heavily embanked for a considerable distance. When this extremely interesting work is still further advanced we hope to be able to refer to it again.

**A Tall Chimney.**—What is described by American papers as probably the tallest chimney in the world is now being completed at East Newark, New Jersey. The diameter at the base is 28 ft., and the ultimate height of the brick structure will be 310 ft., with a diameter at the top of 9 ft. A cast-iron rim 20 ft. in diameter and a bell surmount the whole, and will make the total height of the chimney 335 ft. In its construction 1,700,000 bricks were used, and the total cost will be 85,000 dols.



### THE GLASGOW INSTITUTE OF ARCHITECTS.

THE twenty-first annual general meeting of this Institute was held on the 16th inst., Mr. David Thomson, the President, in the chair.

The President said the members were all aware that the Institute had sustained a very serious loss by the death of Mr. James Sellars—a young man whom they looked forward to holding a foremost place among the architects of this country, and whose work revealed so much power and ability and beauty.

Mr. William Maclean, secretary, read a notice which it was proposed to insert in the minutes, recording the deep regret of the Institute at the death of Mr. James Sellars.

The President formally moved the approval of the minute; and

Mr. Maclean, the secretary, read the following extract from a letter from one of their members, Mr. John J. Stevenson, London, to Mr. W. F. Salmon:—"I should like to join in any expression of regret or sympathy of the Institute at the loss by Mr. Sellars's death."

The President mentioned that a meeting was then being held for the purpose of getting up some memorial to Mr. Sellars in Lambhill Cemetery.

The minute was agreed to.

Mr. William Maclean, the secretary, read the twentieth annual report by the Council, from which we make the following extracts:—

"The Council have to record with deep regret the deaths of Messrs. James Salmon and James Selars, the oldest and the youngest of the past presidents of the Institute, also of Messrs. James Thomson, West George-street, and John M'Leod, both for some time members of council, which have taken place since last report. A committee was appointed in the beginning of the session on the subject of technical education. The committee met with a committee from the Glasgow Technical College and discussed the matter with them, with the result that a curriculum was prepared, and, after being considered and approved of by the Institute, circulated among the members of the Institute for their guidance in the education of their apprentices and of architectural students. The Council hope that members will, in as far as possible, see that the education of their students is carried out on the lines indicated in the curriculum. A representation was also made by the Council that the architectural profession was not represented on the governing board of the college, with the result that Mr. Hoveyman was elected to the first vacancy, and now represents this Institute on the board. The rules for the measurement of wright work have been revised by delegates from this Institute, the Institute of Measurers, and the Master Wrights' Association. Unfortunately the measurers' delegates withdrew before the revision of the rules was completed, and the other representatives were left to complete the work, which they have now done, but the issue of the rules has been delayed in the meantime. Delegates have been appointed at the request of the Institute of Measurers to draw up rules for the measurement of painter work. The Council again put forth an effort to have a separate Building Act for the City of Glasgow, and prepared a memorial to that effect, which was submitted to the Board of the Commission. The memorial asked that if the boundaries of the city were extended, the Commission should recommend that a Building Act be passed, and proper machinery provided for its operation. This, however, the Commission considered to be outside of their powers. The proposed Bill for the registration of architects and engineers was considered by the Institute, and it was agreed to intimate to the promoters that this Institute would oppose the Bill unless its operation was limited to England. In this matter your Council has had the support of the Edinburgh Architectural Association and of the Dundee Institute. At the request of the Royal Institute of British Architects, a petition was prepared and forwarded against the passing of the Bill, which has since been withdrawn. The Institute again agreed to continue the prizes to Haldane's Academy. The examiners last year were Messrs. James Thomson and David Thomson. A communication was received from the Royal Institute of British Architects, asking the opinion of this Institute on the subject of the alliance of non-metropolitan societies with the Royal Institute. After consideration, a reply was given to the effect that this Institute would be glad to form a closer alliance with the Royal Institute, provided that could be done without any loss of the independence and freedom of action which it at present enjoys. It was mentioned in last year's report that the drawings in the competition for the travelling studentship were to be sent in on the 15th of December, 1885. Six sets of drawings were received at that date, which were exhibited for a fortnight in the Corporation Galleries. On the 25th of December the trustees met, and, after careful examination, awarded the prize to Mr. Wm. James Anderson, 63, Cadder-street, Pollokshields. Mr. Anderson, in fulfilment of the conditions of competition, made a sketching tour in the spring and early summer of the

year, and spent fully twelve months in Italy. On his return he submitted the sketches and drawings which he had made, together with a memoir descriptive of his travels. The trustees had every reason to be satisfied with the competition and its results."

The Treasurer (Mr. Watson) also submitted his statement.

The President, in moving the adoption of the report, said that since he assumed office two years ago death had been very busy amongst them, and had carried off many of their oldest and best friends. One of the first was Mr. George Bell, one of the most respected men in the City of Glasgow. This year they had been specially unfortunate. Early in the year they lost their first president, Mr. Salmon, a man very highly esteemed. Shortly after that they met with the loss of Mr. James Thomson, of West George-street, who had long been a member, and a man of very quiet and retiring disposition. After that they lost Mr. John M'Leod. After that, and only within the last few days, they had met with the loss of Mr. Sellars, a man who took a most active part in the affairs of the Institute, and had his interests very thoroughly at heart. From these heavy losses they had sustained it became all the more incumbent upon the members who remained to exert themselves in the interests of the profession. They could not promote the interests of the Institute in a more thorough way than by increasing its members and bringing within it all the eligible men who are within the city and within the province of Glasgow or the West of Scotland. The Exhibition, he went on to say, was expected to yield a very heavy surplus. Many were at a loss what to do with this large surplus. He would suggest that the Institute should approach the Executive and see whether they would spend 5,000*l.* or 10,000*l.* of this surplus, if they could spare it, and devote it to the establishment of a Chair of Architecture in the University. It would be one of the most suitable, one of the most satisfactory, and one of the most praiseworthy acts that could be done, and a very appropriate and suitable mode in which a part of the surplus at least might be expended. In the past two years he had done all he could for the interests of the Institute. In that he had been seconded and encouraged by the office-bearers and the council and members of the Institute, and he desired to thank them all severally very cordially for their very warm support. Specially he commended to the thanks of the Institute Mr. Watson, the treasurer, and Mr. Maclean, the secretary.

Mr. Bromhead seconded, and the report was adopted.

At a meeting of council held immediately after the annual meeting, the following office-bearers were elected:—President, Mr. John Gordon; vice-president, Mr. William Leiper, F.R.I.B.A.; hon. treasurer, Mr. Thomas L. Watson; auditor, Mr. James Thomson; secretary, Mr. William Maclean.

### THE SEVERN TUNNEL:

#### ITS ORIGIN AND CONSTRUCTION.\*

THE history of the Tunnel is this:—In about the year 1862, while superintending the construction of the Bristol and South Wales Union Railway and its Severn piers at the New Passage, I was greatly struck by the peculiar character of the river itself, and of that part of its channel, both of which appeared to me to be singularly favourable for the construction of a tunnel underneath the waters instead of the proposed ferry over them,—an idea, it may be supposed, not unnatural to one whose first engagement, in practical engineering work, had been in the building of the Thames Tunnel. This was under the elder Brunel.

I mentioned my idea, first, to Mr. Leonard Bruton (the able secretary), and afterwards to the directors of the above-mentioned railway, with my reasons for knowing it to be practicable; and I found that they were highly favourable to it. I then further investigated all the facts bearing upon the scheme, and prepared plans, which were first deposited in Parliament in 1863, but had to be dropped for want of money.

Before this time, I had fully appreciated the two physical facts which, in my opinion, insured the practicability of the scheme,—first, the remarkable hardening of the strata in and

around the English stones, which had enabled them to resist the action of the powerful currents and the storm-waves up to that time; and, secondly, the mud, sand, and gravel, carried by the Severn waters, which must, necessarily, choke up any leakage into work below, through such hardened strata.

After a good deal more labour, and some further vain attempts to get the scheme taken up locally, during a period of nearly ten years, it was finally adopted by the Great Western Railway Company, and an Act was obtained for it in 1872.

Sir John Hawkshaw was, at that time, invited to give evidence in support of the Bill in its passage through Parliament; and, after the Act was passed, he was retained as consulting engineer at a small retaining-fee, while I was chief engineer.

The plans were the same as I had at first designed them in 1863.

Under the peculiar formation of the Severn channel at the place I had chosen for crossing under the river, the 400 yards of deep water, the "Shoots" channel was the key to the practicability of the whole of this large and no undertaking; for the rest of the river-bottom could always be got at at low water. The directors had, therefore, prudently and wisely decided to prove the practicability of this plan by the actual driving of a working head through that ground, before they proceeded to spend any money on the very heavy collateral works; which money would have been simply thrown away if the ground under the Shoots should prove to be impracticable.

As so much depended on this 400 yards, therefore, the first object, after getting the Bill was to obtain the most precise knowledge possible of the external form of the Shoots channel itself, in order to select the best place for crossing it within the 300 yards' limit of deviation allowed by the Act.

Special methods and instruments were devised for taking, and locating exactly, the necessary soundings; and, by these means, really accurate sections were made across the channel of the Shoots at every 10 yards within the limits. These could only be taken at low tide, when there was comparatively little current, and this lasted for only twenty minutes at low water of an average tide; the getting of these necessary sections took much time—twenty minutes only being a day's work.

In the end, the result was quite satisfactory, and then the centre line was fixed. But, no further delay was caused by the determination of the navigation authorities to the building of a shaft-head upon the low-water rocks at the edge of the Shoots, in the manner provided in our Act.

After much discussion, this point was eventually conceded, and the shaft was placed shore at Sudbrook, half a mile from the Shoots. It was started in 1873, and the heading towards the Shoots was begun at the close of 1874.

This heading had now to be driven half a mile from Sudbrook shaft, before it got up the Shoots; but, when it had been carried on them, it was found that the ground there was remarkably close and hard Pennant rock, solid beds of great thickness, entirely free from "backs" or fissures, and between which joints were so thin as to be hardly perceptible except where, in blasting, the rock naturally came away to the joint. This was about soundest, strongest, and best material for purpose.

This point having been settled, the old shafts were then got down, and heading started from them in both directions with object of proving the whole of the ground through the tunnel before letting the works proceed, which would then have been tendered for under a full knowledge of what had to be met with,—thus avoiding the claims for possible contingencies which might otherwise have been made by contractors in novel work.

This plan was quite successful so far as part under the river was concerned; but it knocked on the head when the big landslip was struck, a quarter of a mile inshore from river, on the Sudbrook side, and flooded works, in October, 1879, at a time when river-heading had been nearly five years' work, and had been driven two miles under river from the Sudbrook shaft. It was 136 yards of meeting that from the Sea shaft on the other side of the river. The heading had at that time been driven two miles under the river, from one end; that made

\* From a paper read on the 16th inst. by Mr. Charles Richardson, C.E., before the Engineering Section of the Bristol Naturalists' Society.



ed of 15 yards a week, including all delays; it was driven true to the last inch.

It may here be observed that my argument has always been, that, from what I knew of the river, we should have no trouble from the river water above, which was what everybody seemed to dread. I did not pretend, however, to form any judgment as to spring water from the river.

This sudden flooding of the works by the great spring naturally threw the directors into a state of great alarm. They then asked Sir John Lubbock to undertake the main responsibility of the work, and make us joint engineers, of whom he was chief. From that time I could rise, but he could decide.

I believe the spring could then have been let back in a month by boring an 18-inch hole into the heading and pouring in liquid cement till that part of the heading was filled; but the engineer-in-chief would not hear of it.

Sir John then decided to let the contract for the whole work of Mr. Thomas A. Walker; also lower the gradient 15 ft. under the Shoots, at an estimated cost of 50,000. For this a new it had to be got.

My opinion was altogether against the depression of the gradient after five years spent driving the heading, at its then level, all across the river, and finding under the Shoots the strongest and safest rock possible. I suggested, in preference, the driving of a top heading 20 ft. above, along the 300 yards of the river, to prove the ground there also; it seemed to me that the chances of finding open joints in those compact beds of rock were purely imaginary, and it could have been done in twenty weeks; but here again my advice was disregarded. The 15-feet lowering to increased largely the flow from the Big Spring; for when it was tapped a second time, on October 10th, 1883, at the 15 feet lower level, and 90 yards nearer to the shaft, it rushed in fourfold quantity, and flooded the works in the second time—the first inrush having been at the rate of 6,000 gallons, while the second was 27,000 a minute.

It may be mentioned here that when the contractor began to open out the heading under the Shoots into the full-sized tunnel, he also made me of the opinion that the 15-feet lowering had been unnecessary, for, on one occasion, when he, Sir John, and I were standing at the shaft-head to go below, he suddenly remarked to Sir John: "We were afraid in the long place, Sir John," and this he repeated when Sir John did not, at first, catch his meaning.

So much for the Shoots. But another reason urged for the depression of the gradient was to get more head-covering under the Salmonol on the English side of the river, where the bending gradient brought the top of the tunnel up to within about 18 ft. of the river bottom. This was more reasonable; but there the river bottom is accessible at low water of dry tide, and I had always intended to form an artificial roof over the tunnel works there, by driving down a bed of cement concrete—say 6 ft. wide and about 5 ft. thick in the middle. This would have kept out all Severn water. As it was, on the contrary, no precautions were taken, and the Severn water did get in two places, and caused much trouble and expense; for the ground there is of a softer character than that near the Shoots.

With this exception the tunnel has, in all its features, been built entirely according to plans as originally designed before it was adopted by the Great Western Railway Company; the only other difference being that the work all through, both in the tunnel and the bridges outside, was made very much stiffer than I think at all needful, and that all the arches have been built in rings of brickwork instead of with the "vertical bond."

I have long considered ring work both weak and untrustworthy. I have not used it myself for twenty-five years; and, in consideration of views on this subject, a clause (with drawings) was inserted in the specification to the effect that the "vertical bond" should be used in arches and "verts" instead of "ring" work, if the Engineer-in-Chief should give a written order to that effect; but an extravagantly high price was put on that sort of work, and the order was never given. All arches and inverts were, therefore,

400 yards is the top width and 300 yards the bottom width of the Shoots channel.

This also appears from what he says, p. 25, of his own

built in "rings"; and in the tunnel, although each was six rings thick, the pressure on the brickwork of the invert was just double what it was on the arch, because of the greater head of water and the larger radius of curvature: the invert, therefore, displayed the greater weakness. The result was that when the water pressure was put upon the brickwork by corking the pipes, the invert was blown up in a remarkable, though in a quite explicable, manner. The inner ring was blown up first; after that was gone, the second ring was blown; and after that, the third ring was rising, and would clearly have gone in the same way, when the contractor withdrew the plugs and took off the water pressure. This occurred in many places in the invert.

The water-pressure under the invert had been about 60 lb. on the square inch; and thus was proved the fact that "ring" work cannot be relied upon to bear heavy water-pressure, and that is why all the water had henceforth to be pumped.

This having then become apparent, the opening of the railway had to be deferred a year in order that a new 29 ft. shaft should be got down and six large Cornish pumps fixed in it, each capable of raising five million gallons a day. The cost of pumping will, therefore, be a perpetual charge, notwithstanding the excessively heavy brickwork. For example, by the contract one-half only of the tunnel was to have an invert; but it was decided to invert the whole, and this alone added 80,000 to the cost.

This kind of brickwork, and the depression of the gradient, are the only departures from my original plans. The result of the 15 ft. depression is that: (1) the trains have 1,500 ft. more gradient to climb; (2) the pumps have to raise all the water 15 ft. higher; (3) the water-pressure on the brickwork was increased 7 lb. on the square inch; (4) the flow from the Big Spring was very largely increased by tapping it at the 15 ft. lower level; and (5) the additional cost, together with that of the unnecessary brickwork, has amounted to a very large sum.

#### THE SHAFESBURY THEATRE.

This new theatre, just opened, has been erected for Mr. John Lancaster on the designs and under the superintendence of Mr. C. J. Phipps, F.S.A. According to a description which has been sent to us, the theatre stands absolutely isolated, the site being surrounded by Shaftesbury-avenue, Nassau, Gerrard, and Greek-streets, affording access and egress for the public by thirteen doorways into three streets, and for the employés on the stage of five doors. The entrances exclusively for the stalls and balcony-stalls are by five doorways in the principal façade, fronting Shaftesbury-avenue. The entrances to the upper circle and pit are in Nassau-street, with corresponding entrances for exit in Greek-street. The entrance to the amphitheatre and gallery is in Greek-street, with a corresponding entrance and exit in Nassau-street. There are also two additional doorways, one in Nassau-street and one in Greek-street, on the level of the private boxes of the balcony tier, respectively, for the use of the Prince of Wales and the proprietor, but always open and available for the audience on that tier.

The principal entrances in the façade open on to a spacious vestibule, immediately in the centre of which, facing the doorways, is the entrance to the balcony stalls, by a short and direct flight of marble steps. The entrances to the stalls (which are below the level of the street) are right and left of the vestibule. There are glass and iron awnings extending over the pavement at all the entrances for the public, thus affording protection for every division of the audience in case of rain.

The whole of the various tiers and galleries of the theatre are constructed of iron and concrete. Each tier has a corridor six feet wide surrounding it. The high-pressure water-mains are laid on to every part of the building. Refreshment-rooms are provided for the several divisions of the audience. The frontage, which is of stone, and Italian in style, has a covered loggia on the first floor, with a wide balcony opening out from the refreshment-room on the upper circle level. There is also a wide balcony on this loggia opening out from the top level of the gallery. There are also in each side street iron balconies, with means of exit from each upper floor above them. The stage, which is 65 ft. wide by 45 ft. deep, is situate at the back of the block, opening on a level with Gerrard-

street; it has a height of some 54 ft. to the gridiron. The dimensions of the auditory are as follows:—

|                                       |         |
|---------------------------------------|---------|
| Curtain to front of dress circle..... | ft. in. |
| " " upper circle .....                | 35 0    |
| " " gallery.....                      | 40 8    |
| " " back of pit.....                  | 44 6    |
| " " stage.....                        | 58 4    |
| Width of stage opening.....           | 45 0    |
| Height " ".....                       | 30 0    |
| Centre of pit floor to ceiling.....   | 30 0    |
|                                       | 47 0    |

The total accommodation provided is for about 1,800 persons. On either side of the proscenium opening are seven private boxes, one on the stalls level, and three on the first and second tiers.

The hangings are of plush, a rich brown colour, lined with salmon-colour silk. The colours of the decorations are light French grey and gold, and the walls of the theatre are covered with a dark terra-cotta paper. The stage is separated from the auditory by Mr. Max Clarke's patent protected iron curtain, covered on the audience side with green baize, and worked by hydraulic power supplied from the mains of the Hydraulic Power Company, which run up in the subway underneath Shaftesbury-avenue. The auditory is at present lighted by a gas sunlight, but it is proposed very shortly to instal the electric light all over the building.

The following are the various contractors who have been engaged upon the works:—Messrs. Patman & Fotheringham, for the whole of the builders' work, including stage; Messrs. Morland & Son, for the ironwork; Messrs. Jackson & Sons, for the plaster decorations; Mr. Edward Bell, for the decorative painting and gilding; Messrs. Clark, Bunnett, & Co., for the iron curtain; Mr. R. Davison, for the marble and mosaic floors; Messrs. Strode & Co., for the gaswork and fittings; Mr. C. Wadman, for the stalls and balcony seats; and Messrs. Marshall & Snelgrove, for the private-box curtains and draperies.

Mr. Raven has superintended the stage, and Mr. W. Brown has been general clerk of works.

#### ARCHITECTURAL SOCIETIES.

*Manchester Architectural Association.*—The fourteenth session of the Architectural Association was inaugurated on Tuesday evening last by a *conversazione*, which was held in the Athenæum Hall, Manchester. The room was tastefully set out with specimens of "art metal work," furniture, diagrams of stained-glass work by Mr. Henning, of London, and various models of patents and building materials, as well as a great variety of drawings from the School of Art at All Saints, for which medals and prizes have been gained this year. In addition to these, there were drawings by Manchester architects and members of the Association. The London Architectural Association sent a number of well-worked-out designs and sketches, which were exhibited on screens. At the commencement of the proceedings, Mr. A. H. Davies Colley, A.R.I.B.A., delivered a short address, and, after welcoming the many representatives of the architectural and other societies who were present, referred to the importance of co-operation between the architectural societies, and the manner in which this had been recognised in late years. The objects of the Association were then described, and the prompt action of some of its members, which had secured this year a local Examination. The following members took prizes in the elementary classes:—Class of Design: First prize, Mr. A. S. Chadwick; second prize, Mr. A. H. Mills. Class of Construction: Mr. R. Booth. A most enjoyable evening was spent in examining the numerous exhibits. The number of guests and members were upward of three hundred. The invitation card was specially designed by Mr. W. K. Booth, architect, showing several ancient Manchester buildings grouped together *à la* "Old London" at the defunct Kensington exhibitions.

*Glasgow Architectural Association.*—The second of the session's lectures was delivered, on the 16th inst., in the rooms of the Philosophical Society, by Professor G. Baldwin Brown, of Edinburgh University, his subject being the "Art of Decoration." There was a large attendance of members and others interested. The Hon. President, Mr. Thomas Gildard, occupied the chair. Before proceeding to the business proper of the evening, the Chair-



man referred to the recent death of Mr. Sellars, ex-hon. president, and thereafter the President, Mr. Kippie, moved that an expression of the Association's loss be minutated, and a message of condolence forwarded to Mrs. Sellars and family. The motion was seconded by the vice-president, Mr. A. N. Paterson, and unanimously agreed to. The Chairman having introduced Professor Brown, he remarked that all true art was of necessity decorative. This was literally the case in Classical and Medieval times, but, commencing with the Dutch *genre* painters in pictorial art, and with the sculptors of the Italian Renaissance in plastic art, a distinction had arisen between the "artist" (regarded as the painter of subject pictures) and the decorative handicraftsman, a distinction which had gone on increasing to the present day. That this distinction was little felt even in early Renaissance days the lecturer showed by recalling the fact that the greatest artists of that time, Botticelli, Ghirlandajo, Giotto, each kept his *bottega* or shop open to all comers. With a reference to the principles of architecture, the mother art, all-embracing and therefore capable when known and acknowledged of duly regulating the relative values of the other arts, and, in particular, of regulating the decorative arts of to-day, the lecture terminated. A vote of thanks, proposed from the chair, was cordially awarded Professor Brown, who briefly replied.

**Liverpool Architectural Society.**—The opening meeting of the forty-first session of this society (1888-89) will be held at the Royal Institution, Colquitt-street, on Monday next, October 29, at 7 p.m., when the President, Mr. Edmund Kirby, A.R.I.B.A., will deliver an address. With regard to the arrangements for the session, it is announced that the ordinary meetings will be held (if business of sufficient interest is forthcoming) each month, on Monday evenings, at the Royal Institution. Papers have been promised by Sir James Picton, on "The Various Town-halls of Liverpool" (to be held at the Town-hall); and by Mr. James N. Schoolbred, on "Electricity" (about February next); and it is hoped that a member of the society will give some notes on his impressions of architecture in the United States.

#### A PHANTOM CLIENT.

SIR,—There is a person in the Midland Counties, of middle height, about forty years of age, who wears a sandy moustache, and whose writing and spelling are emphatically bad. This man's ways are dark, and he has been practising an extensive system of fraud on architects and builders. His method is as follows: He obtains land, and calls on an architect, whom he asks to prepare plans and obtain tenders. These being satisfactory—and the larger the better—he is in a great hurry to start building; he is particularly anxious that plenty of material should be got on the ground before the excavations are started, for, says he, it might else obstruct the pathway; he demurs to paying any instalment until the building is roofed in. When, however, the first instalment is due, he obtains a mortgage on the building and on the materials on the ground, and is heard of no more.

If asked for references, he complies with the greatest readiness. He writes his own, and goes to the town and posts them, or, as I believe, is assisted by an accomplice. This, probably, is the only expense of the trade.

I and a builder are his last victims.—I think this very last, for henceforth he will not be under the necessity of providing for himself.

I shall feel much obliged if those who have suffered from this man, or from a similar fraud, will communicate with me without delay, as I am desirous of obtaining information against him. I already know of six towns where he has been in practice. W. H. BIDLAKE.

24, Waterloo-street, Birmingham.

#### THE EPIDEMIC OF DIPHTHERIA AT MIDSOMER NORTON.

SIR,—In your last issue [p. 280] you called the attention of those interested in sanitary progress to the above outbreak, intimating that this was a place where sanitation is neglected. Knowing the district fairly well, I think the following facts may prove of interest to your readers, as they are evidence of the effects of one form of modern sanitation on the public health.

Some years ago, new pipe and brick sewers, with brick manholes and gratings of the newest pattern, were laid, providing air inlets and outlets at the

street level for ventilation. After working some time the gratings became blocked, and the existing ventilating-pipes were carried up buildings at the highest points to provide ventilation to the sewers.

On visiting this place some two years ago this system was considered and pointed out to me as a sanitary triumph. The fact of having no smells in the streets was considered sufficient evidence that this method of sewer ventilation was in every way a sanitary success.

Those of your readers who have for any length of time tested the working of sewer ventilation will know that to ventilate sewers by this method was an impossibility, and to those who have not had this experience I would say that the reasons why you cannot ventilate sewers by shafts (similar to a building) are that the temperature in the sewers, being lower than at the openings (in summer), the rushing of water from branch drains and sinks, and the friction on the air in the sewers caused by the sewage flow, forms a greater power than the shafts; thus, to get fresh air in any quantity through them is impossible. Knowing this, I stated two years ago to an inhabitant that sooner or later an outbreak of typhoid or diphtheria would occur.

From reading your extract of the report, the authorities do not appear to have fixed on the exact cause of the outbreak. I attribute it to air in the sewers being retained and a length of time in them, and when any air is thrown out or taken in through these ventilating-pipes it is not sufficient in quantity to affect that in the sewers. From excessive friction, traps are syphoned, and sewer gas of the worst kind is forced into dwellings, contaminating food, especially water, milk, and fish; thus the disease is started.

When two or three cases occur, the soil from them usually passes into the sewers to mix with other matter, and thus a wholesale manufactory of poison is set up, and successfully distributed over the district.

To prove whether the outbreak has occurred through water, bad joints, or sewer-air, let the water be analysed, samples being taken from all sources which are used for drinking purposes; also open the sewers at points where the disease exists, so as to obtain several bags of sewer-gas of the worst kind. Wash these samples through water, milk, and various kinds of food, noting its effects on animals as well as testing it chemically. Then, from whatever source the worst poison is obtained, such source will prove the cause of the epidemic.

B. H. REEVES.

Cedardale, Putney, S.W.

October 24, 1888.

#### ARTS AND CRAFTS EXHIBITION.

SIR,—My attention has been called, somewhat late in the month, to your interesting article on the Arts and Crafts Exhibition [p. 241 ante], and I should be much obliged if you would allow me to correct an error of attribution, contained in the unrevised catalogue.

I had nothing to do either with the design or with the execution of the plaster frieze decoration numbered 246. To Philip Webb alone belongs the praise you justly bestow on this beautiful work.

HEYWOOD SUMNERS.

Chalfont St. Peter, Bucks, Oct. 24, 1888.

#### MEDIEVAL COFFIN-LIDS.

SIR,—As a contrast to the care that is being taken of the stone coffin-lids recently found near Peterborough, illustrations of which, from the sketches by Mr. Irvine, are contained in the *Builder* of Oct. 13, may I be permitted to state that in July, 1886, when walking through the churchyard of Gorleston, Suffolk, I was surprised to find a pathway bordered with stone lids of coffins! On all, if I remember rightly, were depicted floriated crosses, and some, in addition, bore quaint designs, one being a Roundel. I was at Gorleston again this year, and need hardly state that the frost and rain are gradually leaving their marks, and all the designs are disappearing. I made rough sketches of four of the crosses, and deeply regret that I did not copy them a couple of years ago. The coffins discovered at St. Nicholas Church, Great Yarmouth, were reproduced in miniature, and presented to the Norwich Museum. As the rector of Gorleston has recently been in London, it may be hoped that he has heard of the British Museum, and that any further antiquities he may find will be welcomed there. W. F. H.

#### UTILISATION OF SLATE DÉBRIS.

SIR,—In last week's *Builder*, in the "Student's Column," Mr. Artificer, writes, "I have some of the processes for utilising slate rubbish. In addition to those you give, there is a patent granted to Mr. Granville Sharpe and myself for making Portland cement out of slate debris, and works are about to be erected to manufacture it on a large scale at Mr. Assheton Smith's quarry. The slate trade is improving.—Yours truly,

FRANK W. TURNER.

Cararvon, Oct. 22.

#### CRIPPLEGATE CHURCH.

SIR,—In your impression of last week (p. 289), I noticed that you refer to the works recently executed at this church as being carried out by "Mr. Leonard Cubitt, churchwarden and architect." This is not so, as all the work has been designed by me, and executed under my personal supervision.

F. HAMMOND.

1, Circus-place, E.C., Oct. 24.

#### The Student's Column.

##### ARTIFICIAL STONES.—XVII.

Stones made with the Assistance of Alkaline Silicates (Soluble or Water Glass).

THE seventh division of our subject includes some stones which have met with a considerable degree of commercial and practical success, comprising as it does all that class of mixtures to which the silicates of soda or potash or the so-called "soluble" or "water" glasses are essential additions. Mr. Frederick Ransome, of Ipswich, who has been not inaptly termed the "Bessemer of the Artificial Stone Manufacture," was the first to successfully employ these silicates for cementing the component particles of artificial stones. His first patent was obtained in 1844, and in this he claimed the employment of the alkaline silicates for cementing together broken stone, sand, or other convenient earthy or metallic matters; the blocks being subjected to great pressure in their moulds.

This patent was followed by another in 1853, which had for its object the prevention of unsightly efflorescence on the stone formed according to the last patent, and which was attributed by Mr. Ransome to the presence of alkaline sulphates. The method adopted was to add to the stone mixtures baryta or some other compound of barium, so as to effect the formation of the extremely insoluble sulphate of barium; the moulded stone was finally to be heated in a kiln to a bright red heat. In 1855 and 1856 other patents were obtained relating to the production of fusible silicate in the body of the stone at the high temperature of the kiln in which it was fired. In 1861 Mr. Ransome attempted to utilise chalk by mixing it in a powdered or broken condition with the silicate of soda and potash. After moulding, the surfaces are washed over with a solution of chloride of calcium in order to ensure as far as possible the production of a surface of silicate of lime. In another process, chalk, quick-lime, and soluble silicate are thoroughly incorporated and allowed to harden. When chloride of calcium is employed the complete union of the calcium with silicic acid takes a considerable time, and in order to avoid a loss of unchanged chloride, Mr. Ransome proposed in 1864 the immersion of the stone in a bath of carbonate or bicarbonate of soda, when the production of salt or chloride of sodium and insoluble carbonate of lime is effected. A few years later the same patentee proposed the injection of the stone with boiling chloride of calcium solution under steam pressure, and the cooling of it in a partial vacuum. A stone formed of pulverised burnt clay, lime, and soluble silicate was also patented.

A very important step in advance was made in 1872, when, to obviate the necessity of using a solution of soluble glass previously prepared, Ransome mixed with the lime, clay, chalk, sand, or other material, finely divided soluble silica, such as that found in Farnham stone, diatomaceous earth, &c., or obtained artificially in the production of the fumed silica; caustic soda or potash were dissolved in the water used for moistening the mixture. The soluble silicate was thus formed in the interior of the stone, and being in immediate contact with lime, was at once decomposed, insoluble silicate of lime being formed, and caustic alkali set free; this latter again attacks a fresh portion of undissolved silica, and conveys it to the lime, ultimately the alkali itself seems to disappear, it being alleged that a double silicate of lime with the alkali, which is only very slightly soluble in water, is formed.

These are the points of greatest interest covered by Ransome's numerous patents, though only a few have been touched upon. "Ransome's Stone," then, is largely made by incorporating in a mixing-mill clean sand or other suitable earthy or silicious matters with a solution of soluble glass. The paste mass is then pressed into moulds of desired shape, and when sufficiently dry, immersed in or injected with a solution of



ride of calcium. To prevent efflorescence of alkali salts, the stone must be very thoroughly leached. Apoenite," which is the name given to the apoenite according to Ransome's 1872 patent, is free from liability to efflorescence, as already explained, and the stone formed with admixtures remarkably well rapid changes of temperature, alternations of dryness and moisture, the action of acid atmospheres, while it is not that it increases in hardness and strength with age. A good imitation of Peterd granite has been made with this stone adding suitable colouring matters and small broken crystals of natural carbonate of lime to imitate the felspar, and, finally, giving the surface.

According to Ransome's patent, we have to consider a number of other processes in which soluble silicates are employed. Kuhlmann is artificial stone from a mixture of silicate of potash, powdered chalk, lime, limestone, or other calcareous substances. L. Hardinge, in 1853, employed what he named "liquid quartz," which was formed by adding boracic acid, soda, potash, and silica either at steam heat; angular pieces of stone, pebbles, &c., were cemented with this mixture, and, after drying in the moulds, the stone might be polished or varnished with coating of the so-called "liquid quartz," form an artificial marble the above solution mixed with slaked lime in presence of carbonic acid gas, and, if desired, coloured with various metallic oxides.

# RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

4,544, Concrete and Cement, &c. R. B. In a previous specification by this inventor, a method of forming building blocks of concrete is described. This specification details improvements in the method of manufacture, principally by the use of a wirework skeleton, and the use of interlaced work supports, round which the concrete is raised.

4,716, Securing Wooden Blocks in Flooring, A. J. Hopkins.

In a wood-block flooring made in accordance with the invention the blocks are joined by a nail, bolt, dowel of a double-angled shape, formed to a shoulder at about its centre by the angle of half being more acute than that of the other. Fastening is effected by the use of a punch and of a peculiar form to drive in the nails or bolts, that, after the nail is driven into one block, they may also be fixed by the protruding half of nail.

7,814, Preserving Wood. P. L. Quarante

Veuve d'Escalonne. Various chemicals are used for the purpose of the invention, the proportions of which in composition are an essential part of the invention, and the wood is treated either by soaking it in a solution, or by the "Boucherie" process, or the wood is injected in a closed chamber. It is claimed that wood treated in this manner shows no sign of decay after having been sunk in damp ground for years, and that there is no reason why it should not remain permanently proof against decay, by this preservative liquid, it is rendered impermeable, non-inflammable, and nearly incombustible.

7,872, Improvement in Glazing. W. Gibbs. According to this invention, brass or other metal piping is drawn or turned in the shape of "fret-plate," and used, for greater strength and better appearance, in glazing coloured lights.

7,869, Attaching Sash-lines to Window-frames. P. Miller.

By this invention a groove is cut in the side of the h-frame from the top, and the sash-line is pushed into the groove in the frame and led out through opening in front of the recess. A plate with knobs is then fastened over, and secures the sash-line.

10,619, Concrete with Metal Fencing. J. Kleintert.

For fortifications and such-like purposes blocks of concrete having armour-plates let into them are used by this inventor. The plates are dovetailed into the blocks in the course of the manufacture.

11,909, Portland Cement. J. W. T. Stephens

In order to utilise the blue lias pebbles and the grey mud of the Bristol Channel and estuaries, a mixture of these blue lias pebbles burnt and powdered with the clay and a proportion of lime is effected by grinding in a pug-mill. The mass is then rolled in sheets and dried in a rotating retort, and in the usual process of cement-making.

## NEW APPLICATIONS FOR PATENTS.

Oct. 12.—14,663, J. Rogers, Syphon Cisterns or Water Waste Preventers.—14,661, J. Tollerton, Fireproof Curtains for Theatres, &c.—14,666, W. Moore, Smoothing Irons.

Oct. 13.—14,734, L. Wilson, Parquetry and other similar Composite, Wood, and Artificial Wood Surfaces.—14,733, A. Robb, Stonemasons' Points and Chisels, Double Pointer and Chisel Holder.—14,734, B. Russell, Air Inlet Ventilator.—14,746, J. Youngson, Sash Fastener.—14,750, C. Waxin and A. Clerly, Cement or Artificial Stone.

Oct. 15.—14,789, J. Broadhurst, Oven or Kiln for Pottery, &c.—14,806, A. Duff, Drain Pipes.

Oct. 16.—14,853, G. Pankhurst, Brick, Tile, or Slab for Building Purposes.—14,870, T. Kromer, Keys for Doors and Other Locks.

Oct. 17.—14,941, A. Gauge, Electrical Burglar Alarms.

Oct. 18.—14,956, A. Bremner, Combined Lath and Bolt.—14,957, R. Sanders, Sash and Casement Fasteners.—14,953, E. Cox-Walker and A. Swinton, Electric Bells, &c.—14,968, W. Stead, Constructing and Suspending the Vertical Sliding Sashes of Windows.—14,985, R. Hutchinson, Electrical Glass Drivers.—14,990, J. Colton and J. Lambert, Glass Mosaic Work.—14,998, A. Rost, Chimney Flues.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

12,111, T. Gaban, Ventilating Screens for Windows.—12,533, J. Balbirnie, Fireplaces, Grates, &c.—12,685, A. Spaul and C. Callan, Window-sash Fastenings.—12,715, O. Wright, Charging Syphons for Flushing Water-closets.—12,722, J. Finnie, Weather-bar for Doors.—12,730, J. Bradshaw, Chimney Pot or Top.—12,934, G. Cumpston, Preventing the Spread of Fire in Buildings.—13,170, J. Kaye, Opening and Closing Fanlights.—13,244, T. Knowles, Mantelpieces.—13,305, A. Boulton, Wood-Planing Machines.—13,327, H. Waddington, Draught-Preventers for Doors or Windows.—13,344, W. Youlton, Sliding Window-sashes.—13,325, W. Rakeston, Wall-papers.—13,526, J. Twiss, Rakeston, Window-sashes.—13,565, J. Coulter, Building Block or Brick.

## COMPLETE SPECIFICATIONS ACCEPTED.

### Open to Opposition for Two Months.

14,384, R. and W. Hocking, Water-closets.—16,976, S. Jones and R. Roberts, Tenoning or Moulding Machines.—17,993, J. Winterlood, Chimney and Ventilating Cows.—3,664, D. Bacon, Wood-Turning Machinery.—9,556, J. Holroyd, Construction of Faience or Glazed Terra-cotta Mantelpieces, &c.—12,709, H. Lake, Door Hinges.—12,758, H. Lake, Circular Saws, &c.—13,318, C. Anderson, Burglar Alarm.—13,450, C. Merchant, Corbels for Ventilators and Chimneys.—13,444, N. Morris, White Lead.

## RECENT SALES OF PROPERTY.

### ESTATE EXCHANGE REPORT.

Oct. 15. By GRAVES & SON.  
Hyde Park—9 and 10, Portico-place, 28 years, ground-rent £15, 10s. 21,600  
9, Alexander-street, 61 years, ground-rent £9 ..... 700  
By E. WOOD.  
Shepherd's Bush—42, Uxbridge-road, 20 years, ground-rent £5, 5s. 380  
Kilburn—113, 115, and 117, Canterbury-road, 60 years, ground-rent £22, 10s. 800  
Dorset-square—60, Brompton-place, 32 years, ground-rent £4, 4s. 205  
Hackney—10A, 10, and 11, Tudor-grove, 42 years, ground-rent £9 ..... 425  
Bromley-by-Bow—83, Manor-street, 38 years, ground-rent £13, 6s. 130  
By H. HOOPER.  
Walthamstow, East Avenue "Landowne Villa," freehold ..... 305  
Woodford—1, 2, and 3, Violet-road, freehold ..... 560

OCTOBER 16. By WESTON & SON.  
Peckham—8 and 10, Radnor-street, 35 years, ground-rent £15 ..... 510

By WORSFOLD & HAYWARD.  
Shadwell—10, 11, and 12, Milk-yard, freehold ..... 750  
16 to 20, Star-street, freehold ..... 800

By HORRIS, CHAPMAN, & THOMAS.  
North Kensington—101 and 109, Wornington-road, 87 years, ground-rent £15 ..... 435

Holloway—52, Queensland-road, 45 years, ground-rent £5 ..... 115  
Stratford—19 to 25a, Maryland-street, freehold ..... 630

By H. RICHARDS.  
Teddington—5, Orleans-terrace, 91 years, ground-rent £7, 10s. 310

Kenilworth Town—10, Gratton-street, 57 years, ground-rent £7, 10s. 280

Barking-road—The Samson's Arms, 36 years, ground-rent £5 ..... 300

Old Kent road—30, Odell-street, 93 years, ground-rent £15 ..... 665

Acton Green—2 and 3, Cambridge-villas, 93 years, ground-rent £10 ..... 250

Somers Town—54, Sidney-street, 32 years, ground-rent £12, 10s. 225

Dorset-square—25, 26, and 27, Edward-street; 5 and 9, Boston-mews; and 2, Milton-place, 34 years, ground-rent £31, 6s. 9d. 1,180

Hampstead-road—15, William's-mews, 26 years, no ground-rent ..... 190

OCT. 17. By HARRIS & SON.  
Bayswater—54 and 56, Portchester road, 58 years, ground-rent £16 ..... 2,000

Dorset-square—4, Balcombe-street, 51 years, ground-rent £8, 10s. 815

By NORMAN & SON.  
East Bedford—Freehold cottage, and 4a, 2r, 23p., and timber ..... 1,312  
Copyhold plot of land, 2a, 0r, 26p. .... 80  
An enclosure of land, 6a, 0r, 25p. .... 220  
Two cottages and a plot of land, freehold ..... 300  
Enclosures of land, containing 107a, 1r, 2p. .... 4,700

By F. MATTHEWS.  
West-green—"The Woodlands," and 1a, 1r., freehold ..... 1,900

OCT. 18. By NEWBORN & HARDING.  
Canonbury—1 and 3, Northampton-park, 37 years, ground-rent £10 ..... 855

By J. G. & A. PARVOST.  
Limehouse—69, Three Colts-street, freehold ..... 280  
Victoria Park—100, Cadogan-terrace, freehold ..... 280

St. George's-in-the-East—2, Chandler-street, 12 years, ground-rent £24 ..... 50

Bromley-by-Bow—4, Thomas-street, 67 years, no ground-rent ..... 50

Bethnal Green—35, Cambridge-road, freehold ..... 610  
87, Cambridge-road, freehold ..... 590

OCT. 19. By RABER & SONS.  
Barking—7, Broadway, freehold ..... 1,100  
49 to 55 odd, North-street, freehold ..... 780  
67, North-street, freehold ..... 330

Westbourne Park—An improved ground-rent of £40, term 71 years ..... 900  
Hornsey—"The Hornsey Laundry," freehold ..... 600  
A plot of freehold land adjoining ..... 250

## MEETINGS.

### MONDAY, OCTOBER 29.

Society of Antiquaries of Scotland (Rhind Lectures in Archaeology). Mr. E. Munro, M.A., on "The Lake Dwellings of Europe," 7 p.m.  
Liverpool Architectural Association.—Opening Address by the President (Mr. E. Kirby). 7 p.m.

### WEDNESDAY, OCTOBER 31.

Liverpool Engineering Society.—Mr. R. S. Wyld, Junr., on "The Laying of Large Mains," 8 p.m.  
Society of Antiquaries of Scotland (Rhind Lectures in Archaeology).—Mr. E. Munro, M.A., on "The Lake Dwellings of Europe," 7 p.m.

### FRIDAY, NOVEMBER 2.

Architectural Association.—Mr. J. A. Gotch, on "Elizabeth and Victoria," 7.30 p.m.

## Miscellaneous.

**A Cathedral for Pretoria.**—The Bishop of Pretoria has again sailed for his distant diocese. He has taken with him a set of plans for his Cathedral of St. Albans, designed by Mr. William White, F.S.A. It may be a long time before the whole of the structure can be carried out; but his desire is to commence a small portion well rather than to aim at a completed work of inferior character. Probably nothing more will be attempted at present than two or three bays of nave and aisles added on to the east end of the existing temporary building, which would be used for a time as a chancel. The plan is cruciform, with semi-apses to chancel and transepts. The chancel apse is arcaded, with an ambulatory connecting the two chancel aisles, which also are apsidal, and which form the vestries and site for organ. The nave walls, with clearstory, are 40 ft. high. The extreme dimensions are 195 ft. by 80 ft. The building will be chiefly of brick, but with stone columns, caps, and bases of a very simple form, on account of the great cost in working so hard a material. It is proposed to cover the roofs with sheet iron, which is much used in the colony.

**The English Iron Trade.**—The English iron market continues very steady, on the whole, there being a good general demand, which for some products is rather brisk for both finished iron and steel. The same might be recorded of pig-iron if business were not somewhat retarded through makers being disinclined to bind themselves forward on account of the expected and growing dearth of fuel, while the partial settlement of the wages dispute in the coal trade, in favour of the miners, has imparted an additional stiffness to the pig-iron market. In Scotch warrants there is a firmer feeling, and makers' prices are unchanged. Cleveland iron, although 6d. a ton lower on the week, is very firm at 34s. 6d., its present prompt price. Bessemer iron, on the contrary, is 6d. a ton higher. The tendency for pig-iron in Lancashire and Staffordshire is upwards. Manufactured iron, in consequence of a well-sustained demand, is strong, and tending higher, and this feeling has found expression in Scotland by an advance of 2s. 6d. a ton for bars, and of 2s. 6d. to 7s. 6d. for sheets. The tone of the steel market is excellent, there being a movement towards higher prices. Shipbuilders are receiving additional orders, but the increased rates asked for new tonnage have somewhat checked the placing of fresh orders. Engineers are well supplied with work at, on the whole, satisfactory prices.—Iron.



**The Tivoli Concert-hall in the Strand.**—The memorial-stone of the Tivoli Concert-hall and Restaurant was laid on the 18th inst. by Mr. H. J. Leslie, chairman of the company, by whom the enterprise is promoted. The new Tivoli will have a prominent position in the Strand, and a frontage of about 90 ft., the whole of the buildings being of fireproof construction. The entrances to the concert-hall are on three sides of the building. The area is entered by a broad staircase, and is provided with three exits. The balcony is entered from the grand entrance-hall, and has two exits. The first balcony is approached by a wide staircase, and also has two exits, the exit accommodation being equal to over 5,000 persons, whereas the actual seating accommodation is estimated at about 1,000, and the promenade, lounges, &c., about the same. On each tier ample space has been set apart for promenade purposes. The staircases throughout are composed of Eureka concrete. A sliding roof forms a portion of the system of ventilation, besides which there are exhausts fitted throughout the buildings. The interior decoration is Indian in style. The platform or stage is fireproof, and any wood used is coated with fireproof paint. Sprinklers on the non-automatic system have been placed over the stage, and are controlled by valves fixed near the artists' door, where is also placed a hydrant, the whole being under the control of the fireman. The whole building is provided with hydrants. The restaurant consists of a buffet on the Strand level, the palm-room on the first floor, the Flemish-room on the second floor, and the private dining-rooms on the floor above, with the kitchens and offices on the top floor. The electric light will be used throughout the entire buildings, though gas will be laid on in case of emergency. The whole of the restaurant will be heated by hot water. Mr. Walter Emden is the architect, and Messrs. Kirk & Randall are the contractors.

**Sales of Building Land at Southend and Herne Bay.**—There seems to be a very active demand for the building sites on the property known as the Sea View Estate, upwards of twenty acres in extent, situated on high ground about a mile and a half to the westward of Southend, and which is now being laid out for building purposes. About a month since, the first portion of the estate, containing 185 lots, was disposed of in a marquee on the estate, the several lots realising from £10 to £20 each, and producing a sum of £2,600. Last week a second sale of the sites took place at the Alexandra Hotel, Southend, when there was a numerous attendance, the number of plots offered being sixty. There was again an active demand, all the sites, of the same size as those sold at the previous sale, being sold at an average of 25s. each, several shop plots fetching 30s. each. After the plots advertised were disposed of, a purchaser at the former sale requested the auctioneer to sell some plots he had purchased, and these changed hands at a profit of 50 per cent. The proceeds of the sale amounted to £221, making with the first sale, an aggregate of upwards of £3,500. Mr. H. Iles conducted the sale. On Monday night Mr. Iles submitted 126 plots for sale on the Hampton-on-Sea Estate, near Herne Bay. Most of them were sold at prices ranging from 12s. to 15s. each.

**New Metropolitan Electric Light Company's Offices.**—The Metropolitan Electric Lighting Company, which has recently been formed with the view of lighting various parts of the metropolis by electricity, are about to erect new offices at their central supply station. They have just purchased a site for the purpose on the Surrey side of Waterloo Bridge, immediately adjoining the large steam flour mills of Mr. Seth Taylor. The new buildings are to be commenced immediately.

**Robert Boyle & Son (Limited).**—The directors of Robert Boyle & Son (Limited), ventilating engineers, London and Glasgow, have resolved, subject to audit, to recommend a dividend of 12 per cent. free of income-tax, on the ordinary shares of the company for the year ending September last, after placing to the reserve fund one-sixth of the profits earned, and carrying forward 1,241l. 10s. 4d.

**The English Villa System in Copenhagen.**—A company has been formed in Copenhagen for erecting villas and cottages on the English system in the suburbs of Copenhagen. The company is supported by several leading Danish architects, and has a capital of 10,000l.

**Properties for Sale at the Mart.**—On Thursday, Nov. 29, Lowfold, Wisborough-green, near to Pulborough, Sussex, together with an adjoining farm of sixty-six acres. Lowfold embraces nearly 280 acres, along the river Arun, and in the midst of Lord Leonfield's hunt. The house commands a fair view of the Southdowns across the vale. On Tuesday, Nov. 6, Crofton House, Crofton, within two miles south-east of Titchfield, Hants, and near to the valley of the Aire. The pleasure-grounds and meadow-land extend over fifty-six acres. In the channel of St. Peter's Church, Titchfield, which dates from 1243, and of which the northern portion was built by William of Wykeham, a fine monument was erected over the tomb of Sir Thomas Wriothesley, Earl of Southampton, who was Chancellor to Henry VIII. On Tuesday, 30th inst., Rotherfield Hall, Sussex, a fine old manor-house, built of stone, near to Crowborough and Tunbridge Wells. The Early English Church here, standing 600 ft. above the sea, is dedicated to St. Denis, and marks the site of a monastery that was founded in A.D. 800 by some monks from St. Denis, near to Paris, on land given to them by Beorhtic, last over-lord of Wessex. The east window in the chancel was designed, we understand, by Mr. Burne Jones. In London: Nos. 129 and 131, Regent-street, west side, let at rents of 300l. and 350l. respectively, with No. 201, Regent-street, and No. 67, Conduit-street, leased to Messrs. Cramer & Co. at 510s. a year, until next Midsummer, the whole held under the Crown for about thirty-three years to come. The lease and goodwill of the well-known "Groom's" coffee-house at No. 16, Fleet-street, where, next door to the "Rainbow" tavern, the late Mrs. Groom and her predecessors have been established since the end of the seventeenth century. The premises are held on a lease for sixty-one years from 1854, at a ground rent, covering insurance, of 55l. 10s. per annum. And on Tuesday, 13th November, by Messrs. E. & H. Lumley, No. 146, Piccadilly, next door to Lord Rothschild's house, at Hyde Park Corner; held from the Crown for a term whereof sixty-seven years are unexpired.

**The Stoppage of the Ribble Works.**—The stoppage of the Ribble and dock works at Preston, owing to the failure of the Parliamentary Bill of last session, has caused the most disastrous consequences in the town. The Corporation, however, are preparing to promote another Bill in the Session of 1889, and on the 19th inst. passed a resolution which, in the evening, received the unanimous sanction of owners of property and ratepayers at a very numerous meeting which was held in the public hall, at which the Mayor presided. The resolution was in the following terms:—"That it is expedient to promote, and the consent of the Council is hereby given for the promotion, in Parliament in the session of 1889 a Bill for the following, or some of the following, among other purposes, that is to say, to authorise and empower the Corporation to borrow further monies for completing the dredging of the river Ribble, in accordance with the estimate laid by them before the Committee of Parliament in the session of 1888, including the providing of all plant necessary for that purpose, and for completing the docks and works as comprised in the contract between the corporation and Mr. T. A. Walker, dated September 26, 1884, and for this equipment of the said dock and works in accordance with the limitation suggested by Mr. Abernethy, C.E., in his report dated May 30, 1888, or as near thereto as practicable, and for the construction of a graving-dock; that the costs and expenses of promoting such Bill be charged to the Harbour Revenue and Borough Fund account." On going over the unfinished works a desolate scene is presented to view, which, however, must remain until the result of the Bill now to be applied for is known. It appears that the chief causes which have led to the present misfortunes are to be found in the differences amongst the engineers with respect to the navigable channel to the sea. The engineers on the part of the Corporation contend that the Gut Channel is the best, whilst Mr. Abernethy contends that the north Channel outlet would be the only one available.

**Peel, Isle of Man.**—A large clock and tuning carillon has just been erected in the new church here by John Smith & Sons, Midland Clock Works, Derby. It has been carried out to the designs of Lord Grimthorpe, and is stated to be the largest work of the kind in the island.

**The Sanitary Condition of Rotherhithe.**—The Home Secretary having ordered an inquiry into the sanitary condition of Rotherhithe, Mr. Cubitt Nicholls and Mr. Shirley J. Murphy, the appointed Commissioners, on the 19th inst. opened their inquiry at the Board-room of the parochial offices, Deptford Lower-road, Rotherhithe. The Mansion-house Council on the Dwellings of the Poor was represented by Mr. Reader Harris, of the Parliamentary Bar; Dr. Louis Parkes, medical adviser to the Council; the Rev. G. M'Cree, and Mr. Hodgkewille Mr. J. Stokes and other officials of the Vestry represented the parochial authorities. Mr. Nicholls, in opening the proceedings, said complaint had been made to the Home Secretary of the sanitary condition of Rotherhithe, and he thought it best to first hear what the representative of the Mansion-house Council had to say on the subject. Mr. Harris, in his address, said the Council did not appear there as prosecutors but as friends, hoping to assist and aid the Vestry, in obtaining definite steps to put the parish of Rotherhithe in a sanitary condition. The object of the Council was to improve the dwellings of the poor, also, at the same time, to improve the sanitary law of the metropolis. He might mention that the Public Health Act, which was so beneficial outside the metropolis, did not apply within. This inquiry was instituted not so much to amend the law as to enforce the existing law, and so improve the houses of the poor. Their first complaint was that the existing sanitary law was not enforced by the authorities; and, secondly, in this parish there was only one medical officer and one sanitary inspector, and neither of these gentlemen devoted the whole of his time to the duties. The Mansion-house Council had been instrumental in bringing about three inquiries—viz., Clerkenwell, Mile-end, and Bethnal-green, and the vestries of these parishes had since acknowledged the benefits derived from those inquiries. The contention of the Council in regard to this parish was that it was in an insalubrious condition. In October and December last year the Council had examined 1,000 houses in this parish, and these were again examined in March and September last. In March it was found that out of this number 711 houses had unpaved or badly-paved yards; 89 houses had untrapped or defective gullies; and in 581 houses there was no water supply to the closets. It was also found that 201 houses had no dust-bins. After mentioning other defects, Mr. Harris said such a condition of insanitation was deplorable, and the vestry had power to remedy such a state of things. In 1881 there were 4,847 houses and a population of 36,000 persons in the parish, and it would be easily seen that it was practically impossible for one medical officer and the sanitary inspector to cover this large area. The death-rate, according to the reports of the medical officer of the parish, had risen in 1885 and 1886 from 17.9 to 23 per 1,000. In the course of a discussion the Surveyor admitted they had never enforced the supply of water to the closets in the poorer parts of the parish. It was decided that before the next public inquiry was held, and evidence taken, the Commissioners would examine the condition of the houses for themselves.—Times.

**Electric Lighting in the City.**—At last week's meeting of the Court of Common Council, Mr. Pannell, chairman of the City Commission of Sewers, in answer to Mr. Stewart, said about six or seven applications from good companies had been received by the Commission for the electric lighting of either the whole or a part of the City area. These had been referred to the Streets Committee for consideration. Meanwhile, the Solicitor and the Engineer to the Commission, and Mr. Freese, F.R.S., of the General Post Office, had been requested to prepare a scheme on which could be based forms of tender which might be publicly advertised with a view, as soon as possible, to obtain the advantages of electric lighting in the City.

**The New Swedish Houses of Parliament.**—The committee appointed for selecting a design for the new Houses of Parliament in Stockholm has decided upon giving prizes for the ten best designs sent in, and that the successful architects then amend these designs in conformity with the general plan adopted by the committee for the new building.

**Cities of Northern Italy.**—On Saturday the 20th inst., Mr. Edgar H. Selby, A.R.I.B.A., delivered a lecture at Lewisham on some of the principal cities of Northern Italy. The lecture was illustrated by numerous original drawings.



CATERHAM.—For additions to Tupwood Lodge, Cater-

dwelling-house, Northwood, Middlesex. For Mr. A. Comper. Mr. Geo. H. Green, architect, Chesbam:—  
A. T. Wilson, Rickmansworth\*..... £165 0 0  
\* Accepted.

|                              |     |    |    |    |
|------------------------------|-----|----|----|----|
| TIN—                         |     |    |    |    |
| Burma .....                  | 104 | 0  | 0  | 0  |
| Elition .....                | 103 | 0  | 0  | 0  |
| Strait .....                 | 103 | 0  | 0  | 0  |
| Australian .....             | 103 | 0  | 0  | 0  |
| English Ingot .....          | 101 | 0  | 0  | 0  |
| Zinc—English .....           | 22  | 10 | 23 | 10 |
| OILS.                        |     |    |    |    |
| Linseed .....                | 20  | 0  | 20 | 5  |
| Cocunut, Ceylon .....        | 24  | 10 | 27 | 10 |
| Ceylon .....                 | 25  | 5  | 25 | 10 |
| Palm, Lagos .....            | 24  | 0  | 24 | 10 |
| Rapeseed, English palm ..... | 20  | 0  | 20 | 0  |
| Castor, Bombay .....         | 29  | 10 | 0  | 0  |
| Cottonseed, refined .....    | 23  | 5  | 22 | 10 |
| Tallow and Oleine .....      | 19  | 0  | 19 | 0  |
| Lubricating, U.S. .....      | 13  | 0  | 13 | 0  |
| ..... refined .....          | 7   | 0  | 12 | 0  |
| TUPENTINE—                   |     |    |    |    |
| American, in casks .....     | 1   | 13 | 0  | 13 |
| Tallow—                      |     |    |    |    |
| Stockholm .....              | 1   | 1  | 6  | 0  |
| Arangel .....                | 0   | 11 | 9  | 0  |

|                                                                                                                                                              |       |    |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|---|
| BATTERSEA.—For the erection of stables, harness room, &c., at the dust destructor depot, Culver-road, the Parish of Battersea. Mr. J. T. Hilditch, Surveyor. |       |    |   |
| Whitbread .....                                                                                                                                              | 2,895 | 0  | 0 |
| Holloway, Bros. ....                                                                                                                                         | 2,785 | 0  | 0 |
| Higgs .....                                                                                                                                                  | 2,768 | 0  | 0 |
| Gray .....                                                                                                                                                   | 2,760 | 0  | 0 |
| Nightingale .....                                                                                                                                            | 2,754 | 0  | 0 |
| Haslock .....                                                                                                                                                | 2,713 | 0  | 0 |
| Parker .....                                                                                                                                                 | 2,699 | 0  | 0 |
| J. J. Gandy .....                                                                                                                                            | 2,690 | 0  | 0 |
| Sharian .....                                                                                                                                                | 2,662 | 2  | 6 |
| Howard .....                                                                                                                                                 | 2,630 | 10 | 0 |
| Street & Son .....                                                                                                                                           | 2,609 | 10 | 0 |
| Morgan .....                                                                                                                                                 | 2,590 | 0  | 0 |
| Richardson .....                                                                                                                                             | 2,534 | 0  | 0 |
| Brichnell .....                                                                                                                                              | 2,619 | 0  | 0 |

**NORTHWOOD (Middlesex).**—For the erection of dwelling-houses at Northwood, Middlesex, for Mr. Jas. Pelly. Mr. Geo. H. Green, architect, Chessham, Bucks.:—  
W. Larter, Harrow Weald, Middlesex £1,680 0 0  
C. F. Kewley, Uxbridge, Middlesex. 1,473 0 0  
Brown & Sons, Harefield, Middlesex. 1,176 0 0  
Thos. Bennett, Watford, Herts. 1,041 0 0  
A. T. Wilson, Rickmansworth. 1,039 0 0  
\* Accepted.

**PECKHAM.**—For cleaning, painting, ventilating, plastering, and decorating the interior of St. Luke's Church, Peckham:—  
Money Mansland, Wandsworth. £500 0 0  
\* Accepted.

**RISHTON (near Blackburn).**—For the interior decoration of the Church of SS. Peter and Paul, Rishton. Messrs. Stimpson & Duckworth, architects, Blackburn:—  
Helfghway & Son, Manchester. £200 0 0  
\* Accepted.

**STOKE-UPON-TRENT.**—For alterations to the "Wheatheaf" Hotel, Stoke-upon-Trent. Mr. Edwin Penn, architect. Quantities supplied by the architect:—  
Contract No. 1.

|                             |          |
|-----------------------------|----------|
| P. Bennion, Loughton        | £631 0 0 |
| Yoxall & Heath, Stoke       | 558 0 0  |
| N. Barlow, Stoke            | 520 0 0  |
| H. Goodwin, Loughton        | 498 15 0 |
| Bradbury Bros., Stoke       | 471 0 0  |
| G. Harris, Stoke            | 460 0 0  |
| T. Chaffold, Hanley         | 450 0 0  |
| G. Hancock, Stoke           | 449 0 0  |
| J. Breeze, Stoke (accepted) | 430 0 0  |

**STRATFORD.**—For the erection of manufacturing premises at Stratford, for Messrs. A. Bonke Roberts & Co. Mr. Thomas W. Fletcher, architect, 73, Bow-road. Quantities supplied:—  
Haywood & Sons £1,148 0 0  
McCormick & Sons 1,140 0 0  
Gregor & Son 1,137 0 0  
Norton & Sons 1,077 0 0  
G. H. Smith (accepted) 900 0 0

**TUNBRIDGE WELLS.**—For the erection of six dwelling-houses, in Melnyn Park, Mount Ephraim, Tunbridge Wells. Mr. William B. Hughes, architect, 43, London-road, Tunbridge Wells:—  
Chorwood Bros. £10,670 0 0

|                  |            |
|------------------|------------|
| R. Cox           | 10,406 0 0 |
| Borley & Co.     | 9,857 0 0  |
| Holt             | 9,420 0 0  |
| White & Humphrey | 9,377 0 0  |
| Mansfield & Son  | 9,250 0 0  |
| G. Stephenson    | 8,810 0 0  |
| W. J. Wells      | 8,601 0 0  |
| Strange & Son    | 8,315 0 0  |
| W. J. Adcock     | 8,175 0 0  |
| Foster & Dicksee | 7,923 0 0  |
| Corwell & Son    | 7,800 0 0  |
| Wallis & Son     | 7,874 0 0  |
| Bowh             | 7,843 0 0  |
| Avoid (accepted) | 7,479 0 0  |
| Coty             | 7,457 0 0  |

**WALTHAMSTOW.**—For the erection of ten cottages and a shop at Walthamstow. Mr. Christopher M. Shiner, architect, 15, New Broad-street, E.C. Rows:—  
£1,400 0 0

**WANSTEAD.**—For the erection of three shops, stabling, &c., on Rane Cottage-green, for Mr. J. Maughling. Mr. W. Seckham Witherington, architect, 79, Mark-lane, E.C.:—  
Jolliffe, Wanstead (accepted) £1,575 0 0

**WOOD GREEN.**—For the erection of St. Mark's Mission Church, Noel Park. Mr. Rowland Plambe, architect. Messrs. Fowler & Hugman, surveyors:—

| A.              | B.     |
|-----------------|--------|
| Ashby Bros.     | £8,920 |
| Museum          | 8,588  |
| Nightingale     | 8,780  |
| Goodman         | 8,271  |
| Calley          | 8,240  |
| Woodward        | 8,118  |
| Mortier         | 8,078  |
| James           | 7,900  |
| W. Shepherd     | 7,885  |
| Dove            | 7,875  |
| Kilby & Gayford | 7,863  |
| Treasure & Son  | 7,846  |

A. If screens, gallery front, and seats are in oak.  
B. If pitch-pine.

**Randolph Mansions, Portdown-road, Maid Vale.**—In the list of tenders for this job, given on p. 293 of our last issue, Messrs. Holliday & Greenwood were erroneously described as of Battersea, instead of Brighton.

#### TO CORRESPONDENTS.

G. & Co., S. & W. (should send amount).—J. B. W. (ditto).—T. C. N. W. F. E.—G. M. M.—T. W. (thanks see paragraph on p. 29) of last week's *Builder*.—W. G. S. J. B.—A. W. F. S.—B. & F.—T. L. W.—E. T. H.—W. A. B. (below our mark).—B. J. M.—H. H.—W. W.—P. G.—P. W. G. (we will inquire).—W. A. C. (an advertisement).—H. D.—C. H.—C. S.—H. J. P. (too late).—W. E. (too late).  
A. statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline pointing out books and giving addresses.  
Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.  
We cannot undertake to return rejected communications.  
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All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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Advertisements for the current week's issue must reach the Office before THREE o'clock on THURSDAY, and for the Front Page by the same hour on WEDNESDAY.

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AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

Now ready.  
**READING CASES.** By post (carefully packed), 1s.

**W. H. Lascelles & Co.**

121, BUNHILL ROW, LONDON, E.C.

Telephone No. 270.

**HIGH-CLASS JOINERY.**

**LASCELLES' CONCRETE.**

Architects' Designs are carried out with the greatest care.

**CONSERVATORIES,  
GREENHOUSES,  
WOODEN BUILDINGS.**

**Bank, Office, & Shop Fittings.**

**CHURCH BENCHES & PULPITS.**

ESTIMATES GIVEN ON APPLICATION.

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CORSHAM DOWN. FARLEIGH DOWN.

BOX GROUND. COMBE DOWN.

WESTWOOD GROUND. STOKES GROUND.

**THE BATH STONE FIRMS, Limited.**

HEAD OFFICES: BATH.

#### DOULTING FREESTONE.

The stone from these quarries is known as the "Went" Bed, and is of a crystalline nature, and doubtfully one of the durable stones in England.

**THE BRAMBLEDITCH STONE.** Is of the same crystalline nature as the Cheltenham Stone, but finer in texture, and is suitable for firebricks.

Prices, and every information given, application to CHARLES TRASK & SON, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [A]

#### HAM HILL STONE.

Greater facilities have been provided working these quarries, and the stone can be supplied in large quantities at short notice.

Prices, and every information given, application to the HAM HILL STONE, Norton, Stoke-under-Ham, Somerset.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [A]

**Asphalte.**—The Seyssel and Metallique Asphalte Company (Mr. H. Glenn), Office, Poultry, E.C.—The best and cheapest material for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-heds, and numerous, graneries, tan-rooms, and terraces. [A]

#### Asphalte.

Seyssel, Patent Metallic Lava, and White Asphaltes.

M. STODART & CO.,

Office:

No. 90, Cannon-street, E.C. [A]

#### SPRAGUE & CO.,

LITHOGRAPHERS AND PRINTERS

Estate Plans and Particulars of Sale promptly executed.

22, Martin's-lane, Cannon-street, E.C. [A]

**MICHELMORE & REA**

Manufacturers of

CHARLES COLLINGS' PATENT

COLLINGS' PATENT HINGE

LEVER, SCREW, & BARREL BOX

Self-Acting "FALL DOWN" GATE STOP

and IMPROVED GATE FITTINGS of every Description

36A, BOROUGH ROAD, LONDON, E.C.

PRICES REDUCED. LIST SENT ON APPLICATION.

## SHORT TIME CONTRACTS

Can be carried out easily by using our Lamps.

you CAN

## WORK ALL NIGHT

AT MUCH LESS COST THAN BY GAS. + NO STEAM OR AIR-PIPES REQUIRED

Entirely Self-Contained. Portable. Very Cheap.

**F. BRABY & CO., 352 TO 362, EUSTON ROAD, LONDON, N.W.**



# The Builder.

VOL. LV. No. 2387.

SATURDAY, NOVEMBER 3, 1894

## ILLUSTRATIONS.

|                                                                                                                     |                                 |
|---------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Bombay Municipal Buildings (First Premiated Design).—Mr. R. F. Chisholm, Architect. —Elevation to Hornby-road ..... | <i>Extra large Photo-Litho.</i> |
| Bombay Municipal Buildings (Mr. Chisholm's Design).—Elevation towards Cruikshank-road .....                         | <i>Double-Page Photo-Litho.</i> |
| Design for Stained Glass Window, Aldington Church.—By Messrs. Shrigley & Hunt .....                                 | <i>Double-Page Ink-Photo.</i>   |
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### Anglo-Indian Architecture.



We publish among our illustrations this week two large elevations of a design which received the first premium in competition for an important Government building to be erected in Bombay, the work of an architect whose name has been long prominent in connexion with English architecture carried out in the Indian peninsula. The design, the reasons of which we have never got a clear explanation, was abandoned, but it was, nevertheless, in connexion with the author's own statement, his architectural confession of faith in regard to his design, which we print on the page devoted to a description of the illustrations, as an example of one out of two conflicting theories as to the course which architecture, carried out by English hands on Indian soil, should take;—that of adopting or assimilating native styles. The opposite theory, that of planting European forms of architecture on Indian soil, with little modification, may be taken as represented in the large group of railway terminus buildings recently erected at Bombay, and illustrated in *The Builder* for October 13. Whether we are to regard either of the designs thus illustrated as satisfactory examples of the respective methods referred to is not the question at the moment; it is sufficient that they are, in point of scale, important examples of the two opposite principles referred to, and from what we have seen in Anglo-Indian papers, this distinction, between native or English styles, seems to have been taken up and argued rather warmly, partly in reference to one or other of these designs.

It is an indication of progress, and of a more serious interest in architecture among the English community in India, that there should be any principles, or any arguing at all about the matter. When we started building in India for our own wants, we mostly just did over again, in this very different climate, what we were doing in England; beginning with colonnaded buildings and porticoes of pseudo-Classical architecture, and presently introducing Gothic (of a very Strawberry-hill type) for churches; the mistakes made in England in the way of archæo-

logical sham architecture being made over again in even worse form in India, because architectural design was mostly taken in hand by engineers, who did not even properly understand how to carry out archæological architecture. There are signs that the rule of the engineers is coming to an end, and that the idea of the necessity of some artistic element in architecture, and some artistic study to produce it, is taking popular form; and therefore the question, in what direction Anglo-Indian architectural design should be developed, becomes of especial interest just now.

Mr. Chisholm's description of his design and its intention, printed on page 322, amounts, as will be seen, to a decision in favour of almost complete and unreserved reproduction of Hindû architecture of a certain type, with a slight admixture of Mohammedan details, but only such an admixture as had been made already in Indian buildings, executed since the Mohammedan conquest, but before the conquering race had developed the peculiar phase of architecture of which they subsequently left such exquisite remains on the soil of India. Mr. Chisholm speaks, indeed, of proposing to adopt a "modification" of a Hindû phase of art, but the modification seems to consist mainly in the omitting of some of the characteristic decorative details peculiar to the style, and even this omission the author of the design refers to sadly and with regret. After first proposing "a modification of an Eastern phase of art," he describes the building in a later sentence as "Hindû of a very pure type, merely adding such Mohammedan forms as expediency demanded in positions duly sanctioned by usage." This seems to amount to pure copyism, though "in regard to details, the enthusiastic admirer of old work will be grieved to find many familiar forms omitted or pared down, so as to be hardly recognisable; but this, alas! is inevitable." It seems clear, therefore, that what Mr. Chisholm desired was to reproduce an ancient Indian building precisely, and he only regrets that, for reasons which are left to our imagination, he might not do so. It is these inevitable and regretted omissions, perhaps, which produced on us the impression which we mentioned in noticing the drawings at the Academy, that the design was an Oriental one spoiled by European elements—Oriental without Oriental feeling. The author of the design, in a criticism on our criticism, disclaimed all intention or

effort at giving European feeling to it, and perhaps the true explanation of the impression it produced on us may lie in the omissions alluded to in the author's report, which leave us a building with the angularity of form and crudeness of detail characteristic of the native style, without the richness of effect which atones in some degree for the inferior æsthetic of Hindû architecture.

This latter impeachment Mr. Chisholm, no doubt, would deny: so would Fergusson, whose "History of Indian and Eastern Architecture" threw an entirely new light on, and gave a new interest to, the subject. Considering how it had been neglected by English writers previously, and that Fergusson was practically first in the field on the subject, it is not unnatural that he should have given to this subject one-third of the whole space which he devoted to the history of the architecture of the world; but, apart from this special favouritism, such a division of the subject was certainly most disproportionate. Mr. Chisholm's enthusiasm, which sees in Indian architecture work "second to no art in the world but that of Greece," appears to us equally out of proportion. This kind of exaggeration strikes us as a curious instance of the extent to which people may be carried away into enthusiasm for crude and bizarre forms of art, under the influence of special study or interest. You may learn to like anything if you try hard enough. Fergusson made Indian architecture his specialty, and managed to work himself up into an enthusiasm (not always communicated to his readers) even over things that are like the architecture of nightmare, without form, proportion, or logic. The purer and semi-classic forms of some phases of Hindû art are very different from these; but even here how inferior in refinement are the mouldings and the proportioning of the parts, not only to Greek, but even to Roman and Renaissance work. And when Mr. Chisholm can speak, as he does, of the gradual degradation of Hindû architecture through Saracenic influence, the Taj at Agra being quoted as the lowest point of this descent in the architectural scale, we can only regard this as what may be called architectural criticism turned upside down. Regarded merely as a design, the Taj is marked by a purity of line and balance of proportion which may really be called quite Greek, in comparison with the crude details and often disproportioned parts of even the purer forms of Hindû architecture.

One reason, possibly, for this exaggerated



estimate of the purity of taste and detail of Hindû architecture is to be found in the fact that most students who approach the study of Indian architecture are led to expect to find it especially marked by a barbaric richness of effect rather than by any approach to pure form. When such students, therefore, meet with designs showing columns and capitals with a certain resemblance to Classic work, and spaced with regular intercolumniations, and so on, they consider they have been duped hitherto. Here is a new and Classic form of architecture such as they never expected, and forthwith the Hindû architect is ranked with the Greek, with the additional satisfaction derived from appreciating that which is caviare to the general. On the part of an architect, such a perversion of critical judgment could only result, as it appears to us, from a constant habit of looking at buildings with bad detail, and laying aside the study of and familiarity with good detail: especially mouldings. These, as Quatre-mère de Quincy said, are what show the true distinction between refined and unrefined architecture; and no architecture marked by ill-drawn, crude, disproportioned profiles in its mouldings can ever permanently take rank as a fine style of the art, however it may become a fashion for a short time, or with a few perverts. Architects ought to be kept, by their training of the eye, from thus turning aside into the bypaths of architectural style. Engineers, who still have a great deal to do with Anglo-Indian architecture, and who (to judge from visible results) never give a thought to the design of mouldings, or recognise that there is any design in the matter, are, of course, a much easier prey. This is curiously illustrated in a publication by an Anglo-Indian engineer which has been sent to us; a portfolio of studies for various types of building,\* based on Hindû architecture. With the feeling which prompted the publication of the book we have a certain sympathy, and we are always glad to meet with an engineer (there are not too many of them) who considers architectural beauty a thing worth caring for and being enthusiastic about. Mr. Harrington grieves over the crushing out of the old Hindû architecture, first under Mohammedan influence, and, secondly, by the debasement of modern Hindû buildings by the introduction of European styles, "producing a combined Anglo-Hindû-Saracenic, as objectionable as it is unmeaning and degenerate." He wishes to see "the noble ruins of a once magnificent architecture" raised again into an architecture of modern life, and this can only be done by the influence of the Hindû people themselves, when they have become sensible of the absurdity of modern combinations of incongruous styles, "and are determined to restore Hindû art in its purity, adapting it, as far as possible, to modern thoughts and necessities." The great native patrons of art in India have abandoned the indigenous style, Mr. Harrington tells us, and have erected palaces after European styles, because "the untrained native designers are incompetent to adapt modern conveniences to their traditional methods"; which we can readily imagine to be the case. "In the pictures which I give in this portfolio," says Mr. Harrington, "I have studied to apply the indigenous Hindû art in strict purity to the modern necessities of civil architecture. The last fifty years have brought about a great change in the conditions of life among the Hindûs. They now require high and well-ventilated houses where they were formerly content to dwell in a mazy labyrinth of dark and narrow rooms and galleries. Of the difficulties which beset me for the moment, the want of measured drawings of existing ancient Hindû buildings was my greatest." We fear there are more difficulties in such a task than Mr. Harrington is aware of. His attempt is well meant, and in a sense it may be said that it was spirited of him to make it; but of the result the less said the better. He has managed to get hold of all the clumsy quali-

\* Portfolio Studies from the Ancient Hindû Architecture. By B. R. Harrington, Civil Engineer. (No publisher's name.)

ties of Hindû architecture; its coarse, uncouth, ill-designed mouldings (which, indeed, he has bettered, or rather "worsened," in this respect), its ill-considered proportions, without any of its richness or picturesqueness. No one whose eye had been trained upon Classic or Gothic detail could have endured, much less have deliberately put together, such uncouth architectural imaginations. We were much tempted (having permission to use any plate) to publish the "Façade for Municipal Offices" in the Hindû style; but it would be unkind to do so. What we can assure Mr. Harrington is this, that if any attempt should be made to revive and adopt ancient Hindû architecture to modern, it would be a task not to be undertaken with any chance of success save by those who have familiarised themselves with the best schools of architectural style and detail, and have thereby acquired the power to modify and refine upon the Hindû detail in such a way as to revive something of the spirit of the style without its clumsiness of profile and proportion; and those who attempt the task without such training will only produce results which, like his unfortunate portfolio of studies, may be cited as a warning rather than an example.

Apart from this, however, it is odd that any one who has noticed the fact that the eminent native men are taking to European modes of architecture should not have considered how this fact bears on the probability of the future course of native architecture in India. The most prominent and best-educated among the natives, we take it, are almost of necessity the most Europeanised in their tastes and ideas. But the influence which affects them now will affect the inferior classes of the natives in time. The complaint against the native at present, on the part of the Englishman in India, is exactly that he is not at present sufficiently imbued with European habits, tastes, and principles; that it is desirable he should be Europeanised in his ideas. And when he becomes so, as undoubtedly, in spite of all obstacles of caste and prejudice, he will in time, among the forms in which his Europeanised taste is displayed will be his architecture. The Europeanised Hindû will not care for the revival of the ancient Hindû style; it will not suit his feelings or his tastes; he will want to Europeanise his house. This may be regretted on some grounds; but it is the almost certain result of the extension of a European civilisation.

History shows, too, that in the past it has almost invariably happened that a conquering nation carry their own architecture on to the conquered soil. It is the natural tendency of things that it should be so. Wherever the Roman legions went, the Roman Orders followed before long. The partial exception, perhaps, was Egypt; there only the Romans seem to have influenced and modified the architectural style of the country rather than entirely supplanted it. But there they came in contact with one of the most dignified, impressive, and complete styles of architecture that has existed, compared with which, the Hindû, with its want of fixed principle, and its rambling varieties, can scarcely be called a style in the true sense. We are disposed to think, therefore, from the analogy of the past, that the theory of the English builders adopting with little modification the indigenous style of the country, which is illustrated in the competition design we publish this week, is a mistaken one; that the attempt to pursue Anglo-Indian architecture on that principle would fail in the end, from this cause if not from any other, that it would be at variance with the feeling of a Europeanised country. We regard Mr. Chisholm's study, however, as an interesting and, in many respects, pleasing one, which has partially failed in effect from having fallen short of Indian richness and picturesqueness, without the compensation which might have been gained by the introduction of more of the refinement of detail and proportion taught us by Classic work. The author of the design, however, makes a good suggestion in his remark

that if the Greek architect had worked in as hot a climate as India, he would, perhaps, have adopted the sunshade as a part of the entablature. Possibly; but he would have designed it in such manner as to appear more decidedly a portion of the construction, less of a penthouse, than it appears in this modern Hindû design. And if the expedient is to be tried of bringing in the ancient Indian style as the basis of a modern style of architecture, it will be by taking the main disposition and ideas of the Indian building, and refining its mouldings and proportions according to better lights; not by mere archaeological imitation, still less by repeating and exaggerating, as in the book of designs referred to just now, the worst faults of Hindû architecture.

But the more logical method of evolving an Anglo-Indian architecture of the future will lie, as we have already said, in a treatment based on European style, and adapted, both in design and construction, to the exigencies of the climate and the nature of the materials of the country. For general style and feeling (in modern times, at least, where style is a matter of conscious choice, not of unconscious habit) are the expression of the form of culture and civilisation of the builders; treatment in detail is influenced by climate and material. Anglo-Indian builders do not seem to have made many attempts on this principle as yet: they have been mostly content with building European architecture over again.\* But the modification of either Classic or Gothic types to suit the climate and surroundings of India,—not without hints of architectural sympathy, so to speak, with indigenous styles,—would form a fertile source of suggestions for new architectural effect and expression. We do not see why either Gothic or Classic types may not be made the basis. Fergusson has left on record his opinion that Gothic forms, so nearly allied to Saracenic, seemed to offer the best groundwork for that kind of fusion between the European and native architecture which seemed to be requisite. But it might be replied, on the other hand, that there is something of the same kind of affinity between Classic architecture and some of the Hindû forms. The great point is, that a modification of the style in regard to the climate and associations of India should be set about on an intellectual basis, as a piece of artistic development; a task which requires high artistic culture, and cannot be undertaken *ex tempore* by engineers or others who have given no study to architecture as an art. The large railway buildings at Bombay, which we illustrated two or three weeks ago, represent to a certain extent the theory of European style with special local treatment; and its architect has done well, at all events, in searching for decorative detail from native vegetation, and in endeavouring to bring out the taste and ability of native art-workmen in this class of detail. Truth compels us to say, however, that the space we gave to the illustration of the Peninsular Railway Terminal buildings was rather in proportion to the size and importance of the work than to its architectural quality; and the great admiration which the building seems to have evoked locally is one among the many other indications that, in regard to art and literature, Anglo-Indian taste is still in a very provincial stage. It is in Calcutta that would-be great musical executants, who have been estimated at their true value in London and Paris, rise up again, and are placed on a secondary pedestal of fame. It is in Anglo-Indian literary conversation that we hear that Sir Edwin Arnold's "Light of Asia" (being on an Indian subject) is the greatest poetic work of this age. And so, in Bombay, we find people indulging in considerable raptures over architecture which is put forth as "Italian Gothic," but which, it is to be feared, some irreverent people in London would classify as "Manchester Gothic." Allowing everything for good intention, it is matter for regret that so vast and costly a building should have been erected in a style so devoid of artistic refine-

\* Mr. Emerson, if we remember right, left in India some buildings in which Gothic and Oriental feeling were combined with some originality and success.



nt and reserve, to put the matter in derate language. The great Anglo-Indian es, as it seems to us, are much in nt of their Norman Shaw; and, if the iness were once got out of the hands the engineers who have made such sad roc with it, there might be scope for one o young architects of genius to give a new n and development to Anglo-Indian archi- ture, and make the commencement of a w chapter in the history of the art, for ich we are still waiting.

#### THE INNS OF OLD SOUTHWARK.\*

FROM time immemorial "The Borough," by which name the Borough of Southwark,—especially its High-street,—has long been idiarly known to Londoners, has been used for its inns; for their number, their acity, and their excellence. As you run ur eye over the map you may still see rows them side by side, or trace in the dis- ition of the present buildings the places ere long-vanished inns have stood. By ir plans you shall know them—the row bottle-neck entrance, well barred for fonce, expanding rearward into open court- ds surrounded by buildings upon which mmerce has for various uses laid her hand, h which were formerly stables and store- ouses necessary for the wants of throngs of itors. Many causes combined to make "the orough" the paradise of innkeepers. The ater of the Thames in its ancient un- plicated state was found to possess culiar virtue for the brewer; the praises of outhwark ale have been sung in strains of etermined antiquity, and thither the lovers strong ale naturally resorted. Southwark elf, as its name indicates, was simply an tlying portion of the City defences—a tété- -point—covering its approach from the great ain road which gave access not only to the pulous and thriving southern counties, but so to the great ports which were the points debarkation for the most-frequented por- ons of the Continent. As a natural conse- quence of the traffic along this busy route, a population grew upon its borders devoted to e wants of travellers, until, in the early ars of the sixteenth century, the inns were t of all "proportion to the ordinary shops d dwellings," and a State paper of 1619 scribes "the Borough" as consisting "chiefly f innkeepers."

The word "inn" meant originally simply an enclosure or dwelling; though later it became the equivalent of the Continental hotel. The great nobles and dignitaries of the church had their inns, the rendezvous of their family and retainers, and this use of the word still sur- vives in Barnard's Inn, Thavie's Inn, the Inns of Court, &c. They were, in short, the town- ouses of the great ones of the period. The ostelry or herbergery was the precursor of the modern hotel, differing therefrom inas- much as it did not, as a rule, supply lodging as well as board. This may be accounted for by the fact that the great religious houses which were scattered broadcast over the country offered board and lodging for three days indiscriminately to all wayfarers, free, or for such gratuitous douceur as the departing guest chose to give. With such competitors or public favour in the field, there was but little want of inns. The tavern or ale-house was the haunt of roysters and gallants, whose pranks would have met with rebuke under the monastic roof, and the halting-place for the numerous wains which traversed, for business or pleasure, or both combined, the great highways of the kingdom.

The inns of Southwark belonged to an ex- ceptional, although numerous, class. Chaucer's une-and-twenty pilgrims slept at least one night at the "Tabard," and the known extent of this and the many neighbouring inns can only be explained on the supposition that large bodies of people sought similar hospitality

within their walls. It was not, however, until the Reformation had destroyed the monas- teries, and reduced their inmates to want and vagrancy, that the necessity for great inns in large numbers arose. The ever-lengthening trains of attendants on the newly-enriched nobles in their frequent journeys to and from the capital called for vast establishments, and many of the seventeenth-century inns were capable of housing from three to four hundred guests, with their attendants.

The English inn, thus suddenly developed, at once acquired a character for comfort, and even luxury. The host did not lord it over his customers after the foreign manner, but was the obsequious servant of all. His ready smile welcomed their approach; each was free to do as he listed, and call for what he pleased with the certainty that it would be more promptly forthcoming than in his own house. The accounts of the furniture of these old English inns are startling in their copiousness, and contrast strangely with the vacuity of some of the larger mansions of that time.

Harrison, writing in 1577, says:—"Our inns are verie well furnished with naperie, bedding, and tapistrie; for, beside the linen used at the tables,—which is commanlie washed daily,—is such as belongeth to the estate and calling of the ghest. Each commor is sure to be in cleane sheets," and the "ghest" might, when once his chamber was appointed, "carie the kaie with him," and "if he loses ought whilst he abideth in the inne, the host is bound by a generall custom to restore the damage."

The picture drawn of these inns by a con- temporary is quite idyllic. Not only is the fortunate "ghest" treated to the daintiest meats,—dressed to his liking,—and to the choicest wines whereof Southwark in especial had always good store; but if he desired music with his repast, "minstrells, musicians, and chaunters" were at hand, and the host and hostess with superfluous courtesy offered to bestow their company upon him at the board. At his departure, the reckoning was set out in writing, if he wished it so; and if the "ghest," after such handsome entertainment, could find it in his heart to complain of the bill, it was reduced to his satisfaction. He was finally bowed out with smiles and ben- edictions, whilst the chambermaid and ostler brought up the rear and joined in the happy chorus. Oh! those good old times! One's spirits are a little dashed to learn that the polite ostler cheated the poor horses of their provender, if not well watched; and that the tapster was commonly in league with the footpads, who were duly advised by him of the "ghest's" departure and probable route.

Amongst inns of the best type, those of Southwark were pre-eminent, and their fame went out through all the land. One of their functions was the entertainment of strolling players, for Southwark may be called the cradle of the British drama. In the capacious courtyards of its vast inns, rude scaffolds, or "stages," were erected across the entrance; the groundlings sat on the straw in the open court, whilst the "quality" ranged them- selves in the surrounding galleries,—the modern dress-circle, or occupied the small chambers abutting thereon,—the modern private boxes. Nothing could have been more convenient for the purpose, and the fit- ness of the whole is shown in the fact that the theatre of the present day does not differ in principle from this primitive plan. The records of the time bear witness to the showers of expostulations with which the "poor players" were persecuted. But the popular taste proved too strong for the re- monstrants, and the drama grew and flourished under the auspices of the inns which shared in its prosperity. The chief of them were the Tabard, the George, the White Hart, the Flower-de-Luce, the Mermaid, the Christo- pher, the Crown, the Cock, and the Ram's Head; but there were many more.

Of the Tabard, most ancient and most renowned of all—built about 1306—nothing, except perhaps the foundations, now remains. The original structure, which was mainly of wood, was destroyed by the Great Fire of 1676, which swept away the George, the

White Hart, the King's Head, the Queen's Head, and others. The building which was erected on the site of the older Tabard has now also passed away. Some of its features have been preserved in prints and drawings, which show that its plan was of the common type. The age of the building shown in Urry's print was discussed in our issue of June 28, 1873, and assigned to the reign of Charles II. Its sign has undergone the cus- tomary variations, from Syrcote, Circot (=Sur-coat), to its synonym Tabard, and so to Talbot; and its modern representative will no doubt in time become the Turbot, with the eventual addition of "and Lobster Sauce." Stranger things have happened to inn-signs. The wholesale disfranchisement of the saints in the sixteenth century led to equally curious results—turning the Salutation of the Angel to the Blessed Virgin into a soldier and civilian shaking hands, "God encompasseth us" into the Goat and Compasses, and so on. We have ourselves quite recently seen a sign dating from the Restoration appear newly painted and gilt as the "Royal Mortar!"

These old inns share the immortality of some of the greatest names in English litera- ture—Chaucer, Shakespeare, Ben Jonson, Dickens.

Shakespeare lived for a time in Bull Head- alley, and Sir John Falstaff was the owner of a considerable part of Southwark, in- cluding "The Cok," the Boar's Head, which he bequeathed to Magdalen College, and others. It is certain that both the artist and his subject were frequent visitors at the Tabard, and it is not improbable that the carrier scene in "Henry IV.," though laid at Rochester, may have been really sketched in Southwark, for carriers were amongst the inn's constant customers.\* Whatever warrant there may have been for the Falstaff Shakespeare drew,—and authentic history presents him in a somewhat different light—the descriptions of the scenes in which he figures give a clue to many of the features of the lost inns of his time—the ale-benches upon which he slept in the sun after dinner; the red lattice- windows through which Bardolph's fiery visage was indistinguishable; and the parcel- gilt goblets and flea-bitten tapestry of the too- confiding Mistress Quickly.

The White Hart has even a more stirring history than the Tabard, for it was here in 1540 that Jack Cade held court, that Lord Say's dead body was mutilated, and prisoners of all sorts were done to death. In later days it was the scene of an incident in Dickens's most successful novel, but now nothing of it remains.

The George,—formerly the St. George,—is the least altered of all the inns, but it, alas! is doomed. In its palmy days it equipped and sent out daily thirty coaches, and, weekly, fifteen wagons with their teams,—an index to the bustling activity which reigned. One of its chestnut beams escaped the great fire of 1676, and bore the date 1522.† It was called "a Fair Inn" by Stow in 1502. It will shortly exist only in memory, and the same fate is rapidly overtaking its remaining companions.

Sir Christopher Wren built himself a house on Bankside next the Falcon, and is said to have thence daily watched the progress of his great work over the water. Pepys and Evelyn have left frequent references to their visits thither. Almost every great name in English history is connected in some way with "the Borough."

In the delightful book before us, Mr. Rendle, who has spent a lifetime amidst the scenes he so well describes, has gathered all that could be gleaned about the old inns of Southwark, and their inexhaustible associa- tions,—historical, political, antiquarian, social, and miscellaneous. His four hundred and odd pleasant pages are illumined by some of the very best drawings we have ever seen—careful, exact, unaffected, truthful, brilliant,—a lasting credit to his accomplished colleague,

\* This play is generally supposed to have been written in 1597, when Shakespeare was living in Southwark.

† The author of the book before us appears to look upon this as incredible. We have no difficulty in believing it, knowing that hard wood is amongst the best of fire- resisters.

\* The Inns of Old Southwark and their Associations, by William Rendle, F.R.C.S., and Philip Norman, F.S.A. With numerous Illustrations. London: Longmans, Green, & Co. 1888.



whose pencil has preserved for us so much of what is left of the old inns.

We can mentally restore their architectural features by the aid of surviving buildings of the same character and date elsewhere. The frontage towards the street was usually inconsiderable, the houses crowding each other closely, and all edging Citywards. A broad and high gable surmounted by a gilded vane, flanked by a low archway, distinguished each inn, which was differentiated by a boldly projecting and elaborately-painted sign. The lower storey would be almost unadorned, the windows sparse and small, and well above the street. The large, square oaken corner-post would seldom be absent, with its cusped panelling, niches, and statues. At the level of the first-floor, corbelled out upon carved brackets, would run a deeply-moulded oaken cornice, its hollows enlivened by foliage and heraldry. The first-floor would be allotted as reception and dining-rooms, amply-windowed, and with occasional oriels, the construction being of oaken framing, filled in with plaster panels and lined on the inside with wainscot. The upper storey, containing the principal sleeping apartments, would project considerably and be carried on the protruding ends of the joists, and behind the gable above, with its cambered tie-beam and carved barge-board, the sleeping-rooms of the servants and "baser sort" would be ranged. The rear-ward buildings would be quite plain, or relieved only by a little ornament in the pannels of the doorways, and an occasional panel with the arms of the owner. The inner surfaces of the principal rooms would be lined with panelling or hung with tapestry, and have elaborately-enriched ceilings, either in wood or plaster. The fireplaces would be wide and high: in some cases hooded to the ceiling, and the staircases would be substantial and handsome (in one case it was wide enough to allow six people to walk abreast), and with the enclosures to the galleries, the settles, tables, bedsteads, and the rest, would bear witness to the carver's skill. The whole would, perhaps, be a little deficient in both sweetness and light, but it would be eminently picturesque and "paintable." The recent specimens of "Old London" architecture, erected at South Kensington from Mr. Birch's designs, will be in the remembrance of our readers, and give the best idea of the inns that are gone.

By the addition of the words "and their associations" the author has been able to cast his net very wide, and to catch therein all sorts of queer fish. Southwark has been in a marked degree the home of "the Fancy," and as the home of "the Fancy" is generally an inn, a discourse on inns has in the most natural way included much that pertains to the more accomplished professors of "the art," from (Gibb) to Sayers. But these heroes and their feats are out of our province, and so are the humours of Southwark Fair,—the shows, the rope-dancers, strong women, and living skeletons, about all of which and much more the curious may find information in these pages. It would be hopeless, as it would be unfair, to attempt to summarise in a poor column or two all that this author has to say about the old inns, and we must commend all who are interested therein—and who is not?—to this charming book, which has the added charm of perfect paper, printing, and general get-up.

The English inn is passing away. It lingers in out-of-the-way places, and in a few cases lives, or endeavours to live, up to its traditions. But, as a rule, it is now a forlorn and comfortless abode. We are no longer greeted by a smiling host,—a lady clerk ticks us off with chilling unconcern. Our idiosyncrasies receive no consideration. Our very names are ignored. We become mere insignificant units in an indefinite numerical series, and ghost-like, rather than "ghost"-like, poke our way about lonely corridors in big, barrack-like blocks of buildings, "unmarked, un-honoured, and unknown." Our advent brought no welcome, and our exit leaves no regret. The hurry—ever quickening—of our modern life is the cause of the change, for who will put himself about to conciliate a

late "commer," who has his bed and breakfast and is off?

When the last of the old inns shall have disappeared, posterity will be grateful to the author of this charming book for such a loving record of their former glories.

#### NOTES.



MEETING was held on Monday last, which was convened by the Charity Organisation Society, at which a resolution was passed to the effect that the selection of candidates for the new London County Council should turn on their fitness for municipal duties, and not on political considerations. It is satisfactory to see such strong politicians as Mr. Lyulph Stanley and Lord Hobhouse supporting this resolution. It is most important, having regard to the interests which will be in charge of the new County Councils, such as matters connected with drainage, enforcing the safety of public places, and so forth, that politics should be absolutely banished from consideration. When we consider the immense amount of administrative ability which exists unused in London, it is to be hoped that some of it will find its way to the County Council. There are numbers of able men who have fulfilled high duties in India and the Colonies, or who have managed large businesses in this country and abroad, who would be at home on the Council, and far more useful than the being who is now known as the Vestryman, who has hitherto degraded London municipal government.

WE are at last able to form some reasonable judgment of the "sad Athens" of which the paper some few weeks back gave such sensational reports. As we expected, and at the time conjectured, she is not "sad" at all, only looking down intently. The woodcut before us appears in the July number (just out) of the *Ἀρχαιολογικὸν Δελτίον*. It is from an outline drawing by M. Kaweran. The slab, it will be remembered, was found to the south of the Parthenon. Athens is represented leaning with her left arm on her spear,—her right rests on her hips; the whole weight of the body rests on the spear and the right foot, the left being raised on the toe. She wears a simple chiton and her helmet. The noticeable thing about the composition is the attitude of profound thought with which the goddess is contemplating a small stele in front of which she stands. We think that there can scarcely be a doubt that on it is supposed to be inscribed some treaty or dedication of great importance to the city of Athens. Not long after this stele was found, another of considerable interest came to light, a woodcut of which appears in the same *Δελτίον*, on which is a representation of a treaty between Samos and Athens, dated by the Archonship given at the year 405-404 B.C. On the head of the stele the goddess Athene, with spear, shield, and olive-tree, grasps the hand of a woman figure holding a spear, who represents the city of Samos. Below is inscribed the treaty.

A DECISION by Mr. Justice Chitty has been recently reported which is of considerable value. The case is that of *Cann v. Wilson* (*Law Reports*, 29 Chancery Division, p. 39). The defendants were asked to value certain property for the purpose of a mortgage, and it was made known to them for what purpose the valuation was required. Upon the valuation being sent in the advance was made. Ultimately the property realised less than the valuation amount, and the mortgagees sued the valuers for the sum which they lost. It appeared from the evidence that the defendants never made any real valuation. They took the mortgagee's figures and then sent in a particular sum as their valuation. Mr. Justice Chitty held them to be liable for the loss on two grounds. The first was that they had incurred a duty towards the mortgagee to use reasonable care in the preparation of

the valuation; they failed by their negligence to fulfil this duty, and were therefore liable for the consequences. The second ground was that they had made a statement recklessly with the intention that it would be acted on; they had not taken care to ascertain if it was true, and consequently they were guilty of what is legally termed "fraudulent misrepresentation." We hope that such a way of doing business is exceptional.

IT is probable that in spite of the exhaustive judgment of Mr. Justice Stirling in the case of *Lewis v. Weston-super-Mare Local Board of Health*, upon the construction of section 16 of the Public Health Act, the case in question will go before a higher tribunal. The point upon the construction of this section was as to the meaning of the word "necessary"; that is to say, whether it meant "desirable," or whether it meant "absolutely necessary." This urban local authority were constructing waterworks, and it was desirable that they should be carried through the land of the plaintiff. This clearly was not the only course open to them; but, on the other hand, it was the most desirable one. Mr. Justice Stirling decided that the word necessary in the Act meant "desirable," or, as he expressed it, "necessary for the efficient discharge of the duty in the way which is most for the public interest." There is much to be said on both sides, and it is always difficult to construe such a word as this, since different minds look at it from all kinds of standpoints. We are somewhat inclined to think, however, that the construction adopted by Mr. Justice Stirling gives almost too much latitude to public bodies, and scarcely safeguards private interests enough. Private property should not be interfered with by public bodies if it can possibly be avoided. According to this decision, it would seem allowable to cut up a garden by laying water-pipes beneath it, which was the work to be done in the present case, if, by so doing, a slightly shorter route could be taken, and few pounds thereby be saved to the community. For, although such a method of carrying out the work would not be absolutely necessary, it would clearly be for the public interest to save money.

"THE Cistercian Abbey of Strata Florida" will be the subject of a volume to be brought out in January next, by Mr. Stephen W. Williams, F.R.I.B.A., whose name we have already mentioned in connexion with the excavations there. It will be illustrated with plans and plates of architectural detail, &c.\*

IT is announced that on the morning of Oct. 24 last Manuden Hall, in Essex, Mr. R. Gosling's seat, was destroyed by fire. This ancient house had been lately put into thorough repair. It stands north-east of St. Mary's parish church, which Richard de Cornville and Alice, his wife, gave to the monks of St. Melan, in Brittany. It was extensively restored twenty-four years since. Manuden, or Manewden (*vulgo* Mallendine), lies in the Stort valley, in Clavering hundred, on the north-western confines of the county. The manor, which appertains to the Hall, formerly belonged to Robert Greno, or Gernon, lord of Stanstead Montfitchett, close by, who is mentioned in Domesday Survey. It passed to Richard de Playz, who died in 1327; then to the De Veres; and *temp.* Henry VII. one John Gardiner held it of the king for 5s. 11d. yearly rent and fealty. The subsequent proprietors' names form a long list. To this manor is attached that of the neighbouring Battails, or Battles, Hall, which was built by Sir William Waade, Clerk of the Council to Elizabeth and James I. He was son and heir to Armigell Waade, of Belsize, who had served Henry VIII. and Edward VI. in that same capacity. Dying at Belsize, on June 20, 1568, Armigell was buried in the chancel of Hampstead parish church. A voyager in his youth, some aver he was the first of our countrymen to find the southern continent of America.

\* Messrs. Whiting & Co. are the publishers.



WE have received Dr. Parsons's report to the Local Government Board on a threat of diphtheria in the Exmouth town sanitary district; the faulty sewage stem seems at the bottom of it. The following extract from the report will indicate the conditions:—

"The Local Board have of late years reconstructed one of their sewers, and have constructed an intercepting sewer, which collects the sewage and discharges it into the sea at low-water mark, about one-quarter of a mile east of the town. This sewer has necessarily very little fall, and its outlet is tide-locked for about half of each twenty-four hours. In consequence, there is a tendency to the deposit of sediment in the main sewer and in the branch sewers in the low-lying parts of the town, and to counteract this constant attention has to be paid to flushing. The water company being unable to supply water in sufficient volume for the flushing of the sewers, an arrangement has been made by which a stream can be turned into the main sewer, its upper end in the Exeter-road, and diverted by cuttings into side-channels for the flushing of one of the low-lying branch sewers. The sewers in the hilly part of the town are flushed by holding up the sewage in them. The sewers can only be really flushed at low water of spring tide, when there is a free outfall. The sewers receive the surface water, and if a heavy shower occur at the low water when the outfall is closed by the tide, the sewage sometimes bursts up from gratings, flooding the streets and yards, and even the floors of some houses in the low-lying part of the town. The ventilation of the sewers has been a matter of difficulty. A large number of grids at the street level were originally provided, but owing to the complaints which were made of foul smells issuing from these grids, many of them, some fifty or more—have been since closed. In consequence, as the use-drains are neither trapped off from the sewer nor ventilated, when the level of the sewage rises, it does when the outfall is tide-locked, or during a storm, or a storm, the displaced air is driven up the house-drains to escape in or near the houses."

The house-drains are not properly trapped off from the sewers, and (the old evil that occurs in so many of these country districts) many of the water-closets have no water-supply laid on to the pan, but have to be flushed by hand, which, of course, means that they are constantly used without being flushed at all. Another report by Dr. Parsons on an outbreak of the same disease at Llanasa and Whitford, in the Holywell Rural Sanitary District, states that the disease "showed a marked preference for dirty and insanitary houses"—houses with uncleanly surroundings, in the shape of unpaved yards, with lodgment of surface water and accumulations of manure. In one infected house "the dairy was in direct communication with the blocked drain, from which, when opened, black liquid filth burst up with great force. The larder also, in which the food was kept, had only a borrowed ventilation from the scullery, and in the latter was an untrapped sink." This reminds me of Kingsley's "Yeast," where, by the way, Whitford was the name of the insanitary village. A third report, by the same author, deals with diphtheria at Llanwddyn, in the Llanfyllin rural sanitary district.

This village is situated in the upper part of the River Yrwyng, on the site of the new reservoir now in construction for the Liverpool water-supply. The origin of the outbreak is not so clearly traced in this case. Eight families attacked at one time, it is noticed that they all attended church; indeed, such a preference did the disease show for church-goers, that local opinion traced it to some theological cause. Among the practical conditions noted as favourable to the spread of the disease was the separation of houses by a wooden partition only, permitting the passage of air from one house to another; a source of danger which we remarked upon in a recent article on back-to-back houses, where partitions were only carried up to the ceiling line. We have also Mr. Spear's report on the state of the Llanfyllin sub-district of the Narberth union, Merseyside. The following description indicates the general state of the village of Llanfyllin:—

"The drainage arrangements are such as to cause general nuisance. For the most part slop-stairs with other liquid filth is cast into open street gutters formed in the bare rock; so that in traversing the long straggling village foul sewage deposits are met on either hand. And when, as in other cases, refuse matters are thrown to the rear, little

care is taken to avoid accumulation and nuisance, so that the result is only a little less unsatisfactory. Privy accommodation is occasionally altogether absent, and when provided is generally of the most objectionable kind. No organised provision exists for the removal of refuse. Water is obtained chiefly from a public well near the centre of the village street. This well is said to supply good water, but it stands close by one of the sewage-ditches. In summer this source fails, and the people then resort to so-called springs, situated behind the village street, amongst kitchen-gardens and manured ground."

We cannot but remark what a large proportion of the insanitary districts reported on are situated in Wales.

THE School Board for London have just published a schedule of the several parcels of land and hereditaments which they propose to take for their next periodical supply of school accommodation. The total number of schools covered by the schedule is fifteen, and the aggregate of the areas to be acquired is about 25,450 square yards, or five acres and a quarter. The sixteen sites chosen (two of them being alternative) for these additional schools are in the undermentioned Board districts. Chelsea: Victoria Board School, Vespan-road: and the Board School in Waterloo-street, both in St. Peter and St. Paul, Hammersmith, parish. Finsbury: No. 111, Benwell-road, abutting on the Forster Board School in Hornsey-road. Hackney: Columbiaroad, Bethnal-green, and Well-street, Hackney. Marylebone: Cathcart-street, abutting on the Mansfield-place Board School. Tower Hamlets: a large vacant area in Wharf-road, Cubitt Town. Westminster: Nos. 7-12, Chapel-place, Charing Cross-road, by St. Mary's Church. West Lambeth: nine houses and gardens in Brook-street, together with ten houses, gardens, &c., in Walcott-square, St. Mary's parish. Southwark: Suffolk-street and Dartmouth-road, Rotherhithe; and fourteen houses, gardens, and premises in Charles-street and Church-row, in St. John's, Horselydown, parish. Greenwich: nineteen houses, shops, and gardens, &c., in Grove-street, abutting on Sayes-court, Deptford; or nineteen houses, gardens, &c., in Greenfield-street, Deptford; some vacant land, nearly 54,500 square feet superficial, in Childric-road; two cottages, yards, and tenements in Elmira-street, abutting on the Lewisham Bridge Board School, Lewisham: and ten houses, shops, gardens, and premises, on the eastern side of Burrage-road, adjoining the Board School in Burrage-grove, Plumstead.

ST. CUTHBERT'S CHURCH (or the West St. Kirk), which occupies a very prominent position at the west end of Princes Street-gardens, Edinburgh, is about to be remodelled under the superintendence of Messrs. H. J. Blanc and Gordon, architects. The present church was erected in 1775 in place of a cruciform Gothic edifice with a massive tower, which suffered greatly during the siege of the Castle in 1689. Frequent repairs and alterations were made upon the old church, but it was ultimately considered necessary to take it down and erect an entirely new one. The new building is a large and clumsy rectangular edifice covered by a single span roof, and was considered so ugly that public subscriptions were obtained for the purpose of adding a tower and steeple, with a view to obviating, in some sort, its ungainliness. This feature, which is placed at the centre of the west gable, is a fairly good example after the manner of Wren and his followers, but groups awkwardly with the huge mass to which it is attached. The interior is as unattractive as the exterior, and contains two galleries, one over the other, running round the west, south, and east sides, the pulpit being placed in the centre of the north side. The proposed alterations include square towers, surmounted by domes, at the four angles, and certain modifications upon the east of the exterior, especially upon the east elevation. The interior is to be cleared out and the pulpit placed at the east end. The church is seated for a congregation of 3,000,

and to provide the requisite accommodation the galleries will have to be retained. It is impossible to make a structure such as we have described "a thing of beauty," and if an entirely new church is out of the question, the proposed alterations are as good as could be looked for in the circumstances.

THE *Art Annual* for 1888 (which forms the annual number of the *Art Journal*), consists of an exceedingly interesting sketch of the life and works of Mr. J. C. Hook, written by Mr. F. G. Stephens, and illustrated by a large number of engravings from the artist's paintings and sketches. Some of the illustrations remind us of phases of Mr. Hook's art which are now almost forgotten beneath the success and popularity of his coast-idylls, as we may call them; but the principal illustrations are from well-known works of the latter class. Among the purely marine subjects are good illustrations of two of his finest works—"Luff, Boy!" and "Crabbers," in the latter of which we can almost feel the spring of the boat over the wave. A study of a fisherwoman, on the opposite page, is one of the most interesting fac-similes of Mr. Hook's rapid sketches. Readers will find much to interest them in the description of the country home made by the artist for himself in Surrey, and of the master of the house, himself as characteristic and picturesque a figure as any of those in his sketches.

IT is a pity that the *Art Journal*, which in its current number gives some charming illustrations of landscapes, of Henner's pictures, and of Mr. Wood's admirable little picture of the "Water Wheel," should not think it worth while to bestow more care upon its architectural illustrations. The last two numbers include articles on "Some Provincial Clubs," by a writer who has certainly no claim to speak as an artistic critic; but the sketches are much worse than the writing, and the so-called illustrations of the fronts of the Manchester Reform Club, and the Liverpool Reform Club, are mere scratches, rather than sketches, without the slightest intelligible representation of architectural detail; some of the others are little better. In the case of the Liverpool Reform Club the writer omits the name of the architect (Mr. E. Kirby, President of the Liverpool Architectural Society), one of the very first things that we should have thought that an art journal ought to have given. The architect, perhaps, might have pardoned that, if his building had not been so travestied. Modern architects have some right to expect, if their buildings are illustrated in a journal devoted to art, that they should, at least, be decently drawn.

#### LETTER FROM PARIS.

FAVoured by the exceptionally mild autumn, the work at the Exposition Universelle is being pushed on in every direction with the greatest activity. The erections on the Champ de Mars have now reached a state in which they are of constantly-increasing interest to the visitor. Along the quay rise the time-worn fronts of the historical series of dwellings of all ages, styles, and peoples, erected by M. Charles Garnier; among them a restoration of a Gallo-Roman house, which is a veritable architectural jewel. Then, behind the overwhelming mass of the Eiffel Tower, which has risen 30 metres in the last two weeks, are the pavilions for the Beaux Arts and the Arts Liberaux, with their elegant domes and their galleries decorated with a long series of bas-reliefs, emblems, coats of arms, and allegorical figures on a gold ground. Near these rich façades, and in the middle of the enclosure, two structures, without character or style, mark the position of the exhibit of the City of Paris. Without doubt this municipal exhibit, which will summarise the work of all the important public offices of the great city, will present an attractive lesson to the public; but, whatever the inventive genius of the architect may be, we much doubt if such ill-favoured erections, supposing them ever to be completed, can be made to group with the general decoration of the buildings, and we



almost regret the parti-coloured pavilion which this exhibit occupied in 1878.

The great machinery gallery is now complete. The effect from below of the skeleton of gigantic ribs, which is now being decorated, is most striking. The decorators have 18,000 square metres, almost four acres and a half, to cover. This enormous surface is made up of sixteen great panels, each 16 metres square, in which will be represented the arms and emblems of the capital cities of the world, and 124 smaller panels, which will contain the escutcheons of the chief towns of the French departments. Beneath these panels will be ranged a long series of trophies and emblems, plants, machines, and animals, symbolising the productions of the several countries and places. This gigantic work is in the hands of MM. Rabé, Chaperon & Jambon, the skilled decorators of the Paris theatres. As to M. Lavastre, the decorator of the Opera-house, as we believe we have already stated, the central dome is under his care.

To the right and left of the entrance to the machinery gallery are two groups, 10 metres high, executed by MM. Chapu and Barrias, representing Steam and Electricity. Sculpture is elsewhere in the exhibition called upon to play an important part, and particularly in the pavilion of the Argentine Republic, which calls for special mention.

The Buenos Ayres Government were fortunate in choosing as their architect M. Albert Ballu, who, thanks to the ample resources placed at his disposal, has been able to give free play to his fancy and ingenuity. The building is rectangular, and will cover an area of 3,000 square metres. It will be surmounted by five domes, the largest of which will be 32 metres high. The façades, faced with coloured faience by the best makers, terminate in great angle pylons crowned with groups of celebrated persons by M. Ernest Barrias. A central group by M. Hugues is to decorate the principal front. MM. Felix Barrias and Roll have executed for this same front the cartoons for two great mosaic pictures representing, one a shepherd and his flock, and the other agriculture and cattle.

Internally, the ground floor of the building is lighted by a large stained-glass window representing the City of Paris welcoming the Argentine Republic, executed from the designs of M. Toché, the talented young artist who first became known through his decorations at the Chateau de Chenonceaux. To the right and left of the grand staircase are two pictures by M. Duer, "Mining" and "Harvest." The decoration of the central dome is Persian in design. It is to be enriched with statues by MM. Camille Lefevre, Pepin, Turcan, and Charles Gauthier, representative of Art, Science, Commerce, and Agriculture.

The decoration of the smaller domes has been confided to the following artists:—In the first (the Arts), M. Jules Lefevre will paint "Architecture" and "Sculpture," and M. Hector Leroux Painting and Music. In the next (The Sciences), M. Olivier Merson will paint Physical Science and Chemistry, and M. Cormon Astronomy and Electricity. In the third dome (Agriculture), M. Tony Robert-Fleury will represent Fishing and Grazing, and M. Gaston Saint-Pierre Forestry and the Cultivation of the Sugar Cane. In the last dome (Commerce), MM. Albert Benard and Gervex will paint Mining, Tanning, the Railroad, and Coach-building. The decoration of the central dome is to include an ornamental frieze by M. Ch. Lameire, who is also to paint sixteen portraits of Argentine politicians. Finally, the four spandrels will be treated by MM. Chancel and Faivre-Duffer, with paintings symbolical of Seed-time, Harvest, Navigation, and Commerce. This collection of works of art represents about 420,000 francs, and it will be seen from the list of names that this portion of the exhibition will comprise quite a compendium of modern French art.

M. Ballu has also built the "Algerian Palace" in the part of the exhibition allotted to the French Colonies upon the Esplanade des Invalides. This structure, surrounded by open porticos and dominated by an elegant minaret, is faced externally with coloured faience, and has a very happy effect. Next to it is the Tunisian Palace erected by M. Saladin, and opposite is the monument put up by the War Office.

The statue of Shakspeare, lately illustrated in the *Builder*, was inaugurated on Oct. 1 at the corner of the Boulevard Haussmann and the Avenue de Messine. As most of the London journals have described the ceremony, we will only mention that the effect of M. Paul Four-

nier's work is satisfactory, and that he was fortunate in having so tasteful an artist as M. Deglane to design the pedestal. It will be remembered that this young architect exhibited a fine restoration of the Palace of the Caesars in the last Salon, and obtained on that occasion a medal of honour. M. Deglane has managed to combine in the pedestal for the Shakspeare statue great decorative simplicity with a rare elegance of outline. Besides the artistic interest of the occasion, it is pleasant to note this fresh mark of sympathy with English thought on the part of the Parisian public. We must, however, criticise the arrangement whereby the ceremony took place on a Sunday, resulting in the absence of Lord Lytton and the greater part of the British colony. It was a want of tact that might easily have been avoided by the Municipal Council.

Apocryph of international sympathy, we must notice the offer which Mr. Maclean, the United States Minister, has just transmitted to the Paris Municipality in the name of a committee of Americans, presided over by Mr. Pulitzer, the editor of the *New York World*. It is proposed to present Paris with a monumental group in bronze of Washington and Lafayette. This work will be executed by the sculptor Bartholdi, the author of the celebrated colossal statue of Liberty, which now lights the roadstead of New York, and a small reproduction of which, presented by the American colony, will shortly decorate the Ile des Cygnes. If, as there is every reason to believe, the Council accepts the offer of Mr. Pulitzer, the proposed group will be erected either on the Place Lafayette, or, better still, in the Place des Etats-Unis, in the middle of a quarter inhabited principally by the Americans.

The competitive sketches for the monument to the revolutionist Danton have been on view for some days, and by the time these lines appear the jury will, doubtless, have chosen the three artists who will be called upon to enter the final competition. Among the sixty-six competitors who have responded to the appeal of the Municipality are to be found a certain number of names known to the public. Our attention was principally drawn to the sketches of MM. Desca, Falguière, Berthet, Germain, and Auguste Paris. That of M. Desca, in particular, is distinguished by a piquante originality and great vigour. But, on the whole, the competition is poor enough; one can see that the artists were not inspired by their subject, and they appear to have racked their brains to produce ill-proportioned, heavy, and inelegant figures.

We must note in passing the approaching erection in the court of the "Observatoire" of the statue of Leverrier, the astronomer, which M. Chapu has just finished.

The Ecole des Beaux Arts re-opened some weeks ago. The number of students entered in the several sections is about 1,200, that is to say, 400 in painting, 200 in sculpture, 20 in engraving, and 600 in architecture. In consequence of the death of Gustave Boulanger, whose place has to be filled one of these days by the superior council, the painting ateliers are provisionally reduced to two, those of MM. Cabanel and Gérôme. The three ateliers of sculpture are directed by MM. Cavellier, Falguière and Thoms. M. Henriquel Dupont, notwithstanding his great age, remains professor of copperplate engraving. M. Ponscarne directs the atelier of medal-cutting. As to architecture, there are three ateliers, overlooked by MM. André, Gninain, and Guadet. The exhibition of the "Envois de Rome" has just been opened at the Ecole des Beaux Arts. Painting is there represented by a decorative composition by M. Baschet (fourth-year student), a canvas, by M. Puita (third year), "Tobias and the Angel"; also by a copy by the same artist of a portion of Raphael's "Miracle of Bolsena," and a "Lazarus," by M. Lebay (first year).

In sculpture, M. Lombard (fourth year) exhibits a fine group, "Judith and Holofernes." The bas-relief of M. Capellaro (first year) of "Amour and Psyche" is passable. The "Archer" of M. Gardet (second year) is really an imitation of the best works of M. Falguière. In the Section of Architecture we were much struck by the work of M. Redon (fourth year), who has made a restoration of the Temple of Heliopolis, Baalbek, in Syria, the ruins of which were so well described by Lamartine in his "Voyage en Orient." M. D'Espouy (third year) has sent "A Tomb at Pompeii" and a restoration of the Palazzo Linotta at Rome; M. André (third year) exhibits several restorations, among which the best are those of the Temple of

Antoninus at Rome and of the Acropolis at Athens. Finally, M. Defrasse (first year) sends the Temple of Castor and Pollux at Cora.

While speaking of the Ecole des Beaux Arts, we must not forget to mention that the triennial prize founded by Henri Lehmann, the painter, for the encouragement of classical studies, will be awarded for the first time in 1889. The prize, which is worth 3,500 francs, is to be allotted to a painter, not above twenty-five years of age, who shall have executed, in the three years, a picture or cartoon which, in the terms of the gift, "protestera le plus éloquemment contre l'abaissement de l'art." Speaking of Classical art, the executors of M. Lehmann must not go to the Black and White Exhibition to recruit artists for their competition. But, if we are here far enough from the solemnity and stiff forms of academical composition, so dear to M. Lehmann, there is on the other hand an abundance of originality and spirit to regale the eyes of visitors to this new exhibition. In reality, in adding water-colours and pastels to the drawings and engravings, the meaning of the term black and white has been rather unduly stretched, but it is hard to find fault with an arrangement which allows one to see, along with the originals of the plates of all the great illustrated journals of Paris, a series of portraits, studies, and fancy sketches, signed by L'Hermite, Allongé, Régamez, Jeannot, J. L. Brown, Willette, and Caran d'Ache. In fine, the success of this exhibition is much greater than that of the two last ones.

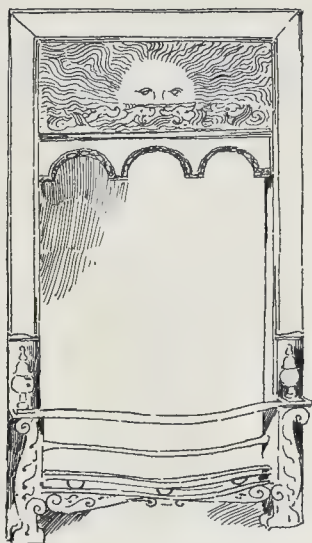
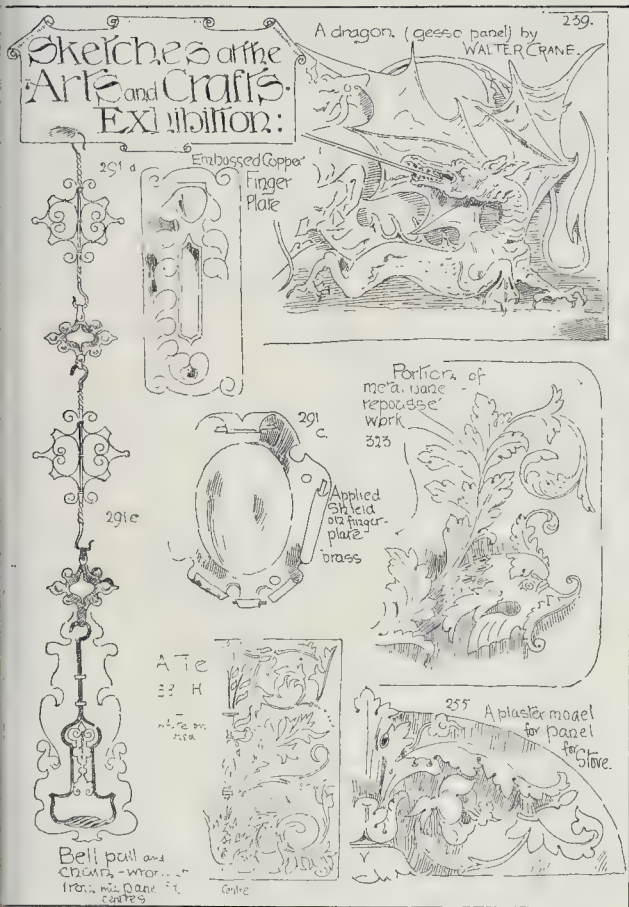
The sale of the Tulleries and the rebuilding of the Opéra Comique are the two great questions of the day for the Minister of Fine Arts. As to the first, the transformation will be easy, for the Post-office buildings and those occupied by the Préfecture of the Seine since 1879 have been completely demolished. A relatively small loan is spoken of, seeing that the garden will be very simply laid out, in anticipation of the still distant day when it may be decided to erect a monument on the site of the Royal palace. At present, this great space, the area of which is not less than ten acres, is transformed into the site of a fair, and the booths of mountebanks take the place of the monumental façades that used to terminate the vista of the Champs Elysées.

The Opéra Comique question threatens to be never ending. The Parliamentary Committee that has charge of the affair, in accord with the Ministry of Fine Arts, has, it is true, decided upon the reconstruction of the theatre with façade to the Boulevard; it had also decided upon a public competition, and M. Steenacker, who was unanimously nominated the assessor, had proposed to receive the designs upon December 31, to exhibit them in January, and to make the awards on February 1. But, at the last moment, the commission retracted its former vote, rejected the Government proposal, which was to confide the reconstruction of the theatre to the office of "Bâtiments civils," and now demands that there shall be two distinct competitions, one for the construction of the building and the other for financing it. There is thus a serious conflict with the Government, and, under the circumstances, unless an agreement can be arrived at, it is probable that the erection of a new Opéra Comique in Paris will have to be abandoned.

On the eve of the International Exhibition, which will inevitably increase the traffic in Paris in a notable degree, we cannot but applaud the action of M. Alphand, who has just decided upon the experiment of erecting an iron foot-bridge at the Montmartre cross-roads, well known by the suggestive name of the "Carrefour des écrasés." This structure, which has been so long talked about, will take the form of two bridges crossing one another, and will cost 22,000 francs. If the experiment is successful, such bridges will become general at other points in Paris, where the carriage traffic is most dangerous to foot-passengers.

We are also able to announce the approaching opening of the Galliera Museum, from which the hoardings are being removed. The railings surrounding the building, which extend as far as the Avenue du Trocadéro, are already in place, and M. Gninain, the architect, will soon commence the internal fittings required for the reception of the collection of works of art left by the Duchess de Galliera to the city of Paris. The monument to Admiral Coligny, too, of which we have spoken several times already, and the principal figure of which we have illustrated, is being actively pushed forward.

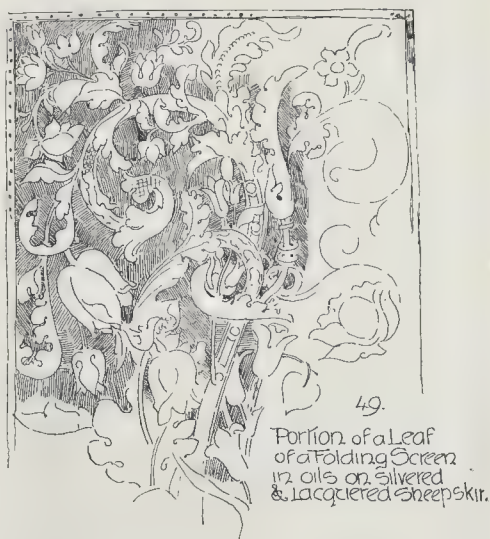
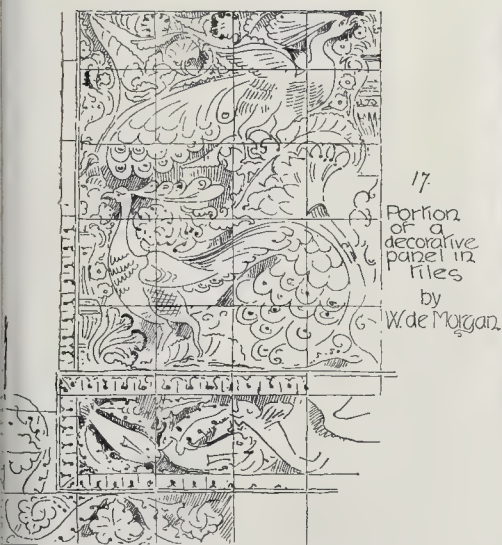




A Grate by R.T. Blomfield.

**BITS FROM THE ARTS AND CRAFTS EXHIBITION.**

We subjoin a few sketches of detail from various works in this Exhibition, including several which we have called special attention to previously. The numbers on the sketches refer to the numbering in the catalogue.



## GRESHAM COLLEGE.

In the address which he delivered at Gresham College on Monday, the 14th ult., as President of the London Society for the Extension of University Teaching, Mr. Goschen dwelt upon the growing union between a comparatively new educational organisation and an old educational endowment. He represented how Gresham devised that scientific and literary instruction should be imparted to business men in London by learned academicians. In comparing that foundation with his own society, Mr. Goschen appeared to suggest that the wealthy financier and Antwerp trader was three centuries fully in advance of his time. During a long period, indeed, the founder's liberal-minded design had received, through various causes, little more than an empty, perfunctory accomplishment. It is not our province to fasten upon the Corporation and the Mercers' Company, in their capacity as joint trustees, the blame for a partial failure in the working out of the trust. This has rested, no doubt, as much with those who were unwilling to learn, as with those who were willing, however inaptly, to teach. Of late years, indeed, the lectures, rendered more available and more attractive, have drawn, within our own knowledge, better and certainly more appreciative audiences. No longer does the resplendent, cocked-batted janitor, in the hall where the old statues are, tell the stranger who asks what goes on within, "Why, nothink goes on here at all—it's Gresham College." The lectures, delivered in a room that is somewhat bare and cheerless, are quite free to the public, who can always rely upon hearing expositions by accredited masters of their respective subjects.

The Greshams, to whom this at all events most well-intentioned foundation owes its origin, derived from a village of that name in Norfolk, five miles south-west from Cromer. A son of Sir Richard Gresham, chosen Lord Mayor in 1537, and his wife Audrey, who were buried in St. Lawrence Jewry, Thomas Gresham was born in the year 1519. On quitting what was then commonly styled Gonville Hall, Cambridge,\* he was bound to his uncle, Sir John Gresham, merchant, who was elected Lord Mayor in 1547. Having married (1644) Anne, widow to William Read, mercer, and a native of Beccles, he made several journeys to Antwerp with his father, as "king's merchant" or "agent," for the negotiation of loans with the Fuggers, Schetz, and other large Flemish houses. There in December, 1551, he took up his abode, and continued in the service of Queens Mary and Elizabeth. The latter, in 1559, made him a knight, and appointed him ambassador to the Duchess of Parma in Belgium. Meanwhile, one Richard Clough managed the office in Lombard-street, by sign of "The Grasshopper." This is the sign whereof Pennant speaks as being owned in his day by the bankers Martin, at No. 68, on the site of Gresham's offices. "Was it mine," says he, "that honourable memorial of so great a predecessor should certainly receive the most ostentatious situation I could find." Now, by the courtesy of Mr. Martin, of the existing firm of Messrs. Martin & Co., we are enabled to state that his house carefully kept the sign that marked the business of Doncombe & Kent, bankers to James II., to which they succeeded. On the rebuilding of their premises in 1794, the grasshopper was laid by, but was not found again, and is supposed to have been stolen. The private parlour of the firm, recently built, stands over part of the ground which was occupied by Garraway's, in Change-alley.

Returning to England in March, 1561, Gresham, fearful of the plague, retired to his estate of Ringshall, near to Needham Market, in Suffolk, where was prepared some of the timber for his great Exchange. Three years later he acquired the sub-manor of Osterley, to which Elizabeth added that of Heston. He enclosed the park and built the house which the Queen visited in 1578. That house was rebuilt, upon the original plan, by the brothers Adam, for Robert Child, the banker at "The Marigold," Temple Bar, by the marriage of whose granddaughter Lady Sarah Fane to George, fifth Earl of Jersey, in 1804, it passed to his lordship's family. The park, lying between Hanwell Asylum and Heston, is within a mile of Southall railway-station. Five years previously Gresham had the honour, and expense, of

entertaining his sovereign at Mayfield, Sussex, in what had been a palace of the archbishops of Canterbury, originally built by St. Dunstan, and which, some twenty-five years since, was converted into a convent. Having introduced radical changes into our financial system by raising loans to the state at home rather than abroad (1569), Gresham was made commissioner to examine into the conditions and rates of foreign exchanges, as well as into the municipal and domestic government of London. We may regard him, in short, as a brilliant successor to William de la Pole, the Lombard-street banker, and "dilectus mercator" of King Edward III. On January 23, 1571, the Queen, proceeding from Somerset House, dined with her "royal merchant" at his house in Bishopsgate-street, and thence went to his new Bourse, as built by Henryke, a Fleming, over the site of the old Tun Prison and other buildings on Cornhill, which she declared to be thenceforth the Royal Exchange.

Sir Thomas Gresham died in 1579, and was buried in St. Helen's Church. He had declared that, failing an heir, the Mercers and the Corporation should succeed to equal moieties of his profits in the Exchange, and of his property in Bishopsgate-street. And so it came about, though not with the ready accord of his widow, who opposed the probate of her husband's will, whereby, in addition to her own ample inheritance, she enjoyed a life-interest of the rentals derived from the various shops and stalls in what was termed the "paw," around the upper floor of the Exchange. These then amounted to about 750*l.* a year. On Lady Gresham's death in 1596, the beneficiaries entered upon their inheritance, and in June of next year were begun, at Gresham's House, the lectures for which they were to provide professors. The courses extended to law, music, astronomy, geometry, physics, divinity, and rhetoric, the last being about equivalent to literature. To the lecturers were assigned rooms in the College, and a stipend of £50 a year apiece, afterwards increased to £100 in lieu of lodging. The trustees referred to Oxford and Cambridge Universities the nomination of the professors. Oxford named three at once; Cambridge, it is said, demurred for a while, taking it ill that the College had not been founded there. In the end, however, Cambridge appointed three others, and Elizabeth settled the difficulty as to the seventh professor by naming one who happened to be a member of the two Universities.

The best presentment of the College, as partly rebuilt in 1601, is Vertue's bird's-eye view, from the west, dated 1739. The greater court measured 110 ft. by 140 ft., the smaller (to the east) an inch was the "reading-hall" 36½ ft. by 63½ ft. The Broad-street, or western, front was 200 ft. long, with a retreat from the astronomy professor's lodgings at the northern corner of 186 ft. In the upper floor of this front were the White Gallery and the law professor's lodgings, below these the almshouses, founded by Gresham and since rebuilt for eight occupants, in the City Green-yard, Cripplegate Without. This print, being 14½ in. by 11½ in., contains full reference to the professors' and other apartments. At the gate leading out of Broad-street into the stable-yard—which lay south of the great court—is depicted the termination of the historic duel between Dr. Radcliffe and Kneller. These buildings were demolished by 1768, the site having been sold, for no more than a perpetual annuity of 500*l.*, to the Government, who utilised it for a new Excise Office, whereof W. Robinson was architect. The Excise removed thither from what had been Sir John Frederick's house, now site of Frederick's-place, Old Jewry. This latter Excise Office was pulled down in 1853, and the ground is now covered by a range of offices, by style of Gresham House. The lectures were transferred in 1768 to a room above the (second) Royal Exchange. After the destruction by fire of the latter on January 10, 1838, the present Gresham College was erected, from George Smith's designs, in Basinghall-street, and opened to the public on November 2, 1843. During this five years' interval, the lectures were delivered in the old City of London School. In the hall and beneath the staircase are some statues from Jarman's Royal Exchange. One is Sir Thomas Gresham, by Pierce; another is Charles II., which latter we take to be (whilst failing to obtain definite information on this point) the figure for which Gibbons had 500*l.* and, *teste* the *Gazette* of

May, 1685, a patent to sell any engraving from it, "to be first seen at his lodgings in Great Piazza, Covent Garden." Hatton gives an amusing account, written in perfectly good faith and extending over several pages, "of the most remarkable rarities in the Repository at Gresham College." These, in fact, formed the Royal Society's Museum, ranging in interest from Newton's reflecting telescope and Wren's "instrument wherewith to draw Perspective to "a bone said to be taken out of the Maiden's Head." The Royal Society, which originated in 1645, frequently held their weekly meetings in the College, and, after their incorporation in 1663, made it their permanent home,—"though with a brief interval spent at Arundel House in 1666-7, until they migrated to Crane-court, Fleet-street, in 1710. According to the report of a Royal Commission held some forty-six years ago, the annual value of trust property of Gresham College, as vested in the Mercers, was computed to be worth 6,000*l.*

## LIVERPOOL ARCHITECTURAL SOCIETY.

## THE PRESIDENT'S ADDRESS.

The opening meeting of the forty-first session of the Liverpool Architectural Society was held on Monday evening last, at the Royal Institution, Colquitt-street, when the President, Mr. Edmund Kirby, F.R.I.B.A., read his opening address as follows:—

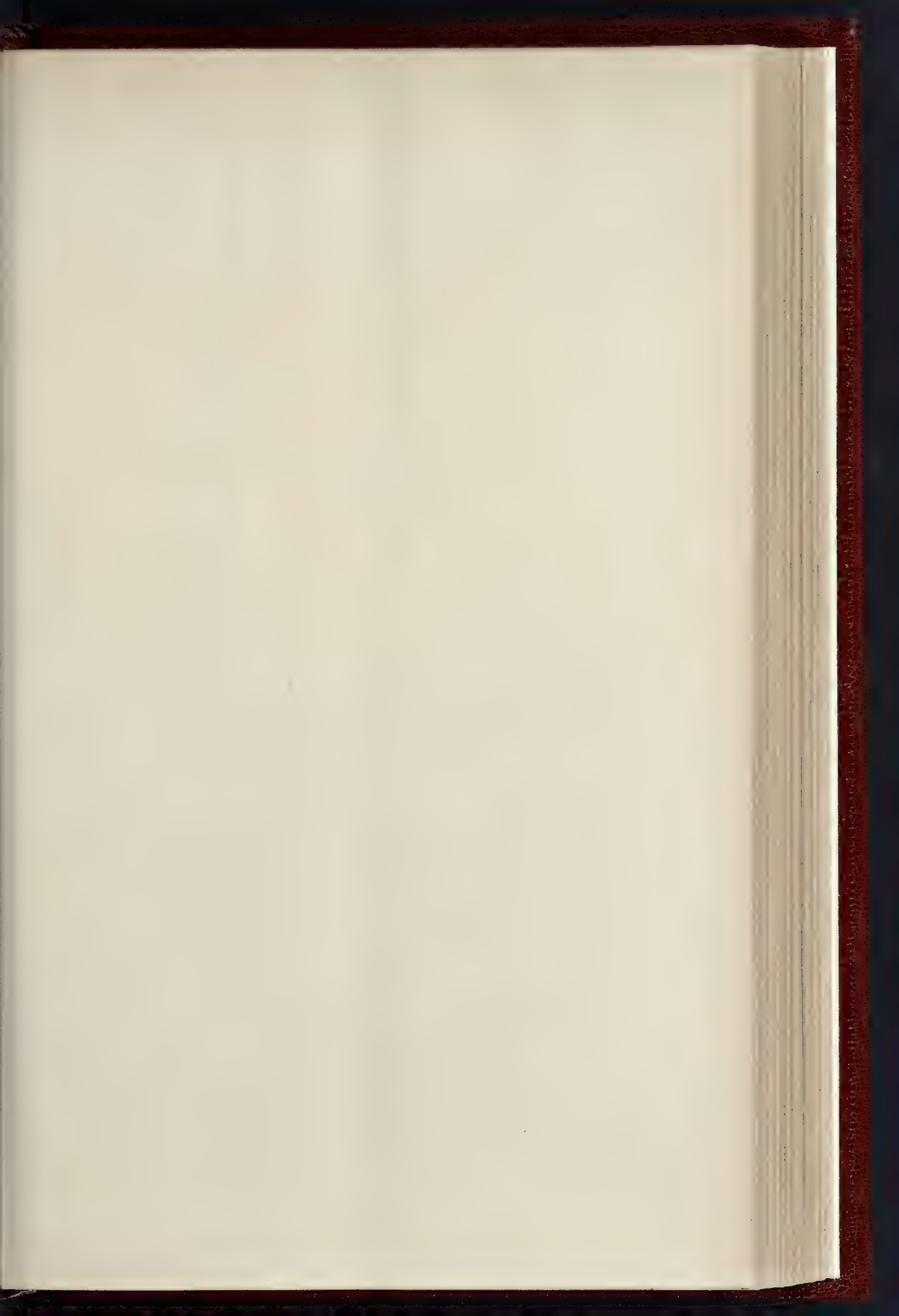
Although, speaking generally, architecture has not been in so much demand by the public, and correspondingly the work of the architect has not, as much as we might have desired, been called into its active service, still, in opening the forty-first session of this Society, it is satisfactory to observe from the annual Report of the Council the pleasing facts that the average attendance at our meetings last session has been more numerous than the previous one by about half as much again, and that the roll of our members, as compared with that of previous sessions, also shows a satisfactory increase, after making allowances for the occurrence of the ordinary lapses which follow societies by resignations and through death.

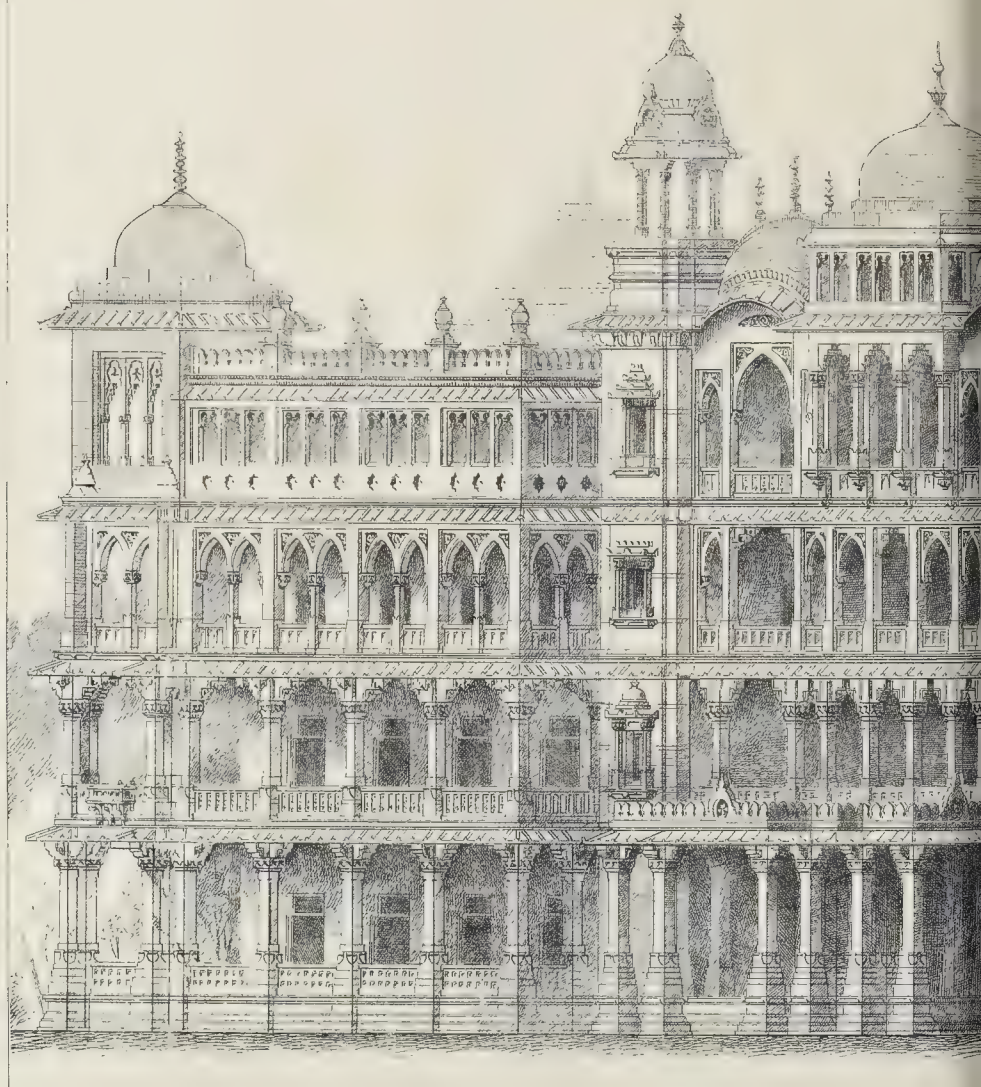
The late Mr. Sherlock has already been lamented by this Society. In Mr. T. B. Crosses we have lost a gentleman who showed much practical interest in our welfare; and by Mr. M. H. Bloxam's death, the archaeological world has lost one of the last of that small but able band of pioneers, now passing away, who, some fifty or sixty years ago, with a sure, careful, and learned method, unearthed the neglected beauties of the national architecture of this country. Luckily, their work lives in the books and in the papers they have published, and as time goes on these will become every day more and more valuable, as authorities to which we can refer with pleasure and with interest. At the period when writers of Mr. Bloxam's type flourished, the antiquities of this or that old church, mansion, or castle were the chief objects of research and discussion. In fact, precedent was the standard on which criticism was measured. Hence the source from which the architect of that day derived the influence which formed his style. And, following on these lines, he so scrupulously modelled his designs as to be able, if challenged, to explain by chapter and verse his authorities from some old work or other for every form of feature or variety in the turn of a moulding. The care and study induced by such practice must have given an excellent grounding to such early training. It must be confessed, however, that in many instances the final result terminated in the dull monotony; since the lack of inherent impulse in the individual translator naturally left his productions a lifeless mass of dry bones. Still, experience has proved, especially in those architects who have been the shining lights of the revival, that not only did they carefully follow and study the precepts of the old work, but when they designed they also produced the best, but also the most original creations.

Nowadays we are apt to smile at the careful drudgery which the pursuit of archaeological precedent entailed on our immediate predecessors. Changed conditions and the everyday development of travelling are evolving a new state of affairs architectural, which would astonish the practitioners of thirty or forty years ago, could they but again revisit us. Since their days how much have we not gained by the advantages in study and travel that we possess? Let us, as we are now moving towards the last decade of this remarkable

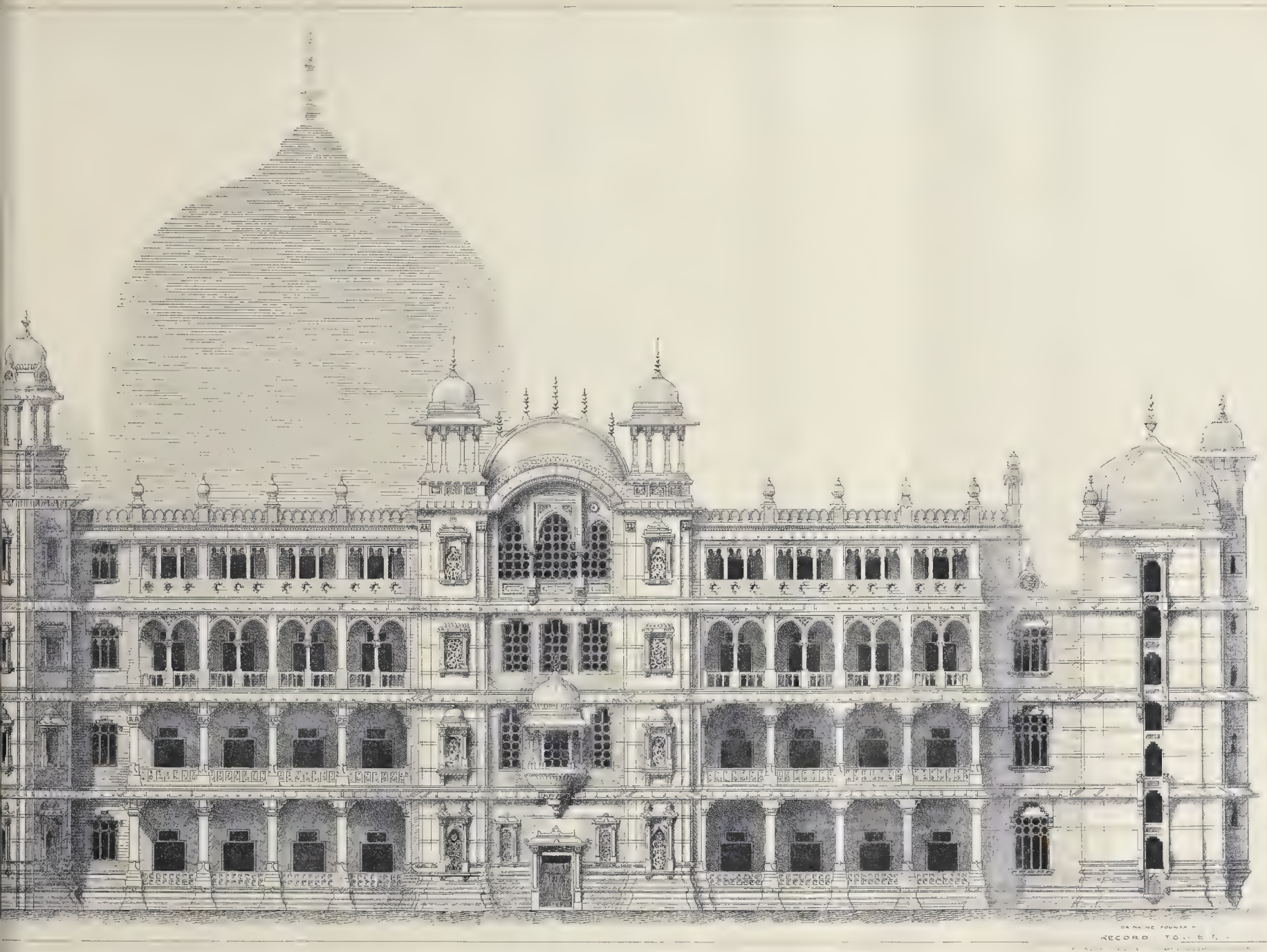
\* Strictly speaking, the Hall of the Annunciation of Blessed Mary the Virgin, under the foundation of Bishop Bateman, Gonville's executor. Dr. John Caius obtained his charter in 1558.











OFFICES COMPETITION; FIRST PREMIATED DESIGN. ELEVATION TOWARDS HORNBY ROAD.—MR. R. F. CHISHOLM, F.R.I.B.A., ARCHITECT.





tury, pay a visit to the Liverpool Free Library, and make an inspection of the magnificent collection of architectural books and drawings waiting us, and filled with the strations and researches of authors gathered in all the divisions of the globe. From the innumerable data which they are ready to close, we can raise the veil, behind which by be discovered the hidden secrets held by art of every clime.

With all this wealth of authority and information before us, is it too much to hope that the immediate future will develop those who, patient and laborious study, and by the sowing of the true principles which led the of olden days, may yet live to produce in a dem garb works aspiring to equal the glories triumphs of former times?

The eagerness with which we nowadays go into practice, the rapidity with which signs must be turned out of an office, naturally train the student from drinking at the fountain-head of the grand works of antiquity, it forces him to fly to the fugitive illustrations in the architectural papers for here a and there a bit (as a milliner would do a costume in a lady's journal) in order secure the most fashionable phase of a timey, ingle-nook, window, or any material igh happens to be in vogue for the day. What the consequence? Not only do we find the he chimneys and other popular features in ferent parts of our own neighbourhood; but may travel from north to south, or east to west, throughout the land, and discover in every town or its district similar diluted plagiarisms. In these remarks no criticism is presumed to be passed on any particular architect's work; the style may happen to be the rage, existing a passing word on this—that beautiful so many designs may be still, in my opinion, it were possible for one particularly well-known artist to make a bad design, his draughtsmanship is so wonderful that the wave of his pencil seems to have the charm of turning dross to gold, and a debased curve into a pleasant e; but that does not say that we can do it, that the art is true which is so gifted.

As I have previously remarked, the man who studies most patiently becomes, as a designer, the most original. And it cannot be too strongly red and impressed that any new and vigorous development in style, to which we may look ward in the future, must be the result of individual research.

The clever "Queen Anne" men have proved s. True originality and freshness will be quired only by becoming what they themselves were,—ardent students of the ancient models,—and that by the dint of close application and diligent draughtsmanship. In a presidential address one can but tread upon the skirts of a subject of such moment and interest to the advancement of true architectural art. Its importance and the large area it covers suggest its being pursued in a form, more definite and of greater comprehensiveness than a fugitive notice can afford to it. rhaps, in the lectures, &c., to be delivered at the coming Art Congress, we may hear of something that may bear on the question of modern design from some of the promised speakers.

At the Walker Art Gallery, on the evening of Monday, December 3rd, Sir Frederick Leighton, President, will open the Congress with an address. Then, the following morning of Tuesday will be occupied by an address relating to the Section of Architecture, by Professor Aitchison, A.R.A., from which, naturally, we, as architects, may expect our principal pleasure and most attractive interest. Nor can our sympathies be shut out from the address on Wednesday morning by Mr. Walter Crane, on a subject of which our control is potent, viz., the applied arts.

Nor again, should we, whose discussions are so lately dwelt upon the art of sculpture, id its application to public buildings, miss the opportunity that Wednesday afternoon offers in hearing from Mr. Alfred Gilbert, R.A., his views upon that branch of art in which esteem holds him up so highly as a upitor of great promise. On Tuesday afternoon, and on the mornings of Thursday and Friday, addresses of general artistic interest, ough not so particularly pertaining to chitecture, will be given with reference to,—(1) "Painting," (2) "Art History and Museums," (3) "The National and Municipal Encouragement of Art,"—respectively by Messrs. Alma Tadema, R.A., Sidney Colvin, and the Right on. A. J. Mundella, M.P. I must not regret that it is hoped that our Society will be represented during these addresses.

There are several amongst us whose voices will be heard with welcome, and, I am sure, their arguments will not only add to the interest of the discussions which follow the papers that are read, but will be the means of enriching them. We must not overlook the fact that it is by the invitation of the City of Liverpool that the first Art Congress is being held in our midst. No citizen can seriously read the prospectus which announces the programme without feeling himself in harmony with the intentions it formulates for the general good. How much more, then, should architects take full advantage of the coming discussions by practically attending them, and listening to the words of wisdom and experience which are brought to their very doors, not only by the choicest lecturers in painting, sculpture, and architecture which the Royal Academy can afford, but by others equally gifted in the sections over which they will preside? Provincial architects now have an opportunity of brushing away any local insularity, and of broadening their higher sympathies by seizing this present opportunity, so as to be in a position by which they can discuss and be in touch with the chief artistic and architectural questions now brought uppermost in Metropolitan art circles by the flow and progress of events, commercial and artistic. The inherent beauty and interest which always attach themselves more or less to the objects of architectural art are sufficiently attractive to the sincere student as to require no additional words of mine to offer further inducements to arouse attention and enthusiasm in their pursuit.

Whilst bringing its claims before your notice, I must remark that had there been no Art Congress, some of the addresses you will possibly hear there would in all probability have been delivered within these walls. Hence, during this session, I fear we must not expect the same numbers of papers as were given during the last one. However, I am happy to say that Sir James Picton, whose wonderful vigour and energy commands our admiration, has very kindly promised a paper on the interesting subject of "The Various Town Halls of Liverpool." The meeting for this paper will be held (not in the Town Hall, as stated in the annual proceedings), but at the Free Library, on an evening later to be fixed, and where, through the kindness of Sir James, the members are invited to partake of his hospitality. In February, Mr. James N. Shoolbred, C.E., one of the principal authorities on electric lighting, will give a paper on that subject, with especial reference to its connexion with and its application to commercial and domestic purposes.

Whilst on the question of papers, it will be interesting to quote for your consideration a judgment given in a local court of law, referring to the "Corporation leaseholds," a question which you will remember as being so ably treated in our first paper, read at the beginning of the year by Mr. J. W. Davidson. Arguing from precedents, it was pointed out then, and, subsequently, at various meetings of leaseholders, and also before the Select Committee on Town Holdings, that although there was no covenant on the part of the Corporation to renew their leases, yet the original intention of the Liverpool Corporation lease was grounded on the understanding that the Corporation would not refuse, when called upon to do so, to renew the lease, and the practice had been invariably to renew on the terms advertised, which terms were produced at auction of Corporation property.

Now, last August, at the Chancery Court, St. George's Hall,—in the Royal Infirmary Light Case, "Martin v. Brocklebank,"—the question of the renewal of a Corporation lease was brought before Vice-Chancellor Bristowe, who then decided and laid down that the Corporation could refuse the renewal of a lease, and that they had a perfect right to do so. I call your attention to this particularly with reference to the interest it has on the valuation of property.

In the retrospect of recent events I must not omit to mention that in June last a crowded and representative meeting of the Masters and operative members of the local plumbing trade was held in the Free Library, under the chairmanship of the Master of the Worshipful Company of Plumbers, London. The meeting was also attended by several professional members of this society. Not only this society, but the public generally, must recognise with satisfaction the establishment by the Plumbers' Company of London of a local Committee for the conduct of examinations for the registration of plumbers for the district around Liverpool.

Besides improved sanitary science in the department of plumbing, I think we may look forward to a better state of things in the construction of the public sewers; and if these improvements could include a comprehensive system of sewer ventilation, the Medical Officer of Health's periodical reports on the public health would, by their diminished averages, give pleasure to himself and much satisfaction to the inhabitants generally. It must be admitted that Liverpool is no worse in this respect than the generality of other towns; but inquests which have been held during the last two or three years in Birkenhead, Widnes, and, I believe, Liverpool, have shown that suffocation from sewer-gas has been the cause of death to workmen connected with this branch of work, and it has been proved at the same time that the fatal gas is still floating about the sewers in large and dangerous quantities without adequate means for its proper escape and safe removal away from the streets and the homes of the population.

In looking forward to the future, the federation of this Society with the Royal Institute of British Architects must be regarded as a step of much importance and advantage to the Society. There can be no question as to the position the Institute holds as the only body to which the architectural world looks as the centre of professional fellowship. No doubt there are other younger and excellent societies in London doing good work. Nevertheless, it is the Institute which enjoys the Royal Charter, dispenses the Royal Gold Medal and the various prizes which are connected with some of the most honoured names of the profession. Whilst we shall retain our own independence, the advantages gained by the new alliance are several, amongst them being that members of local societies who are also members of the Institute can deduct the sum of their local from their Institute subscriptions. The library and rooms of the Royal Institute of British Architects are open to all members of this and other societies who happen to be affiliated with it. We gain an interest in the management by the election—if he be a Fellow—of your President to the Council of the Institute.

There is one point respecting this movement for alliance which I think you will agree to be of importance, that is, in case (as it may sometimes happen) that the course of one's general practice should not run smoothly, then, being all members of the same body, the whole strength and experience of the profession will be at our command, and whatever help and assistance that may be found necessary will be willingly afforded to us.

In connexion with the Royal Institute, you will see in the public prints that this Society will conduct an Examination in Architecture during the week commencing February 25th, 1889. It will be held in Liverpool for the convenience of gentlemen living in the district, and I trust that as many students as possible will seriously appreciate the great advantages now brought to them, and present themselves for examination. Besides gaining the honour of passing the Examination, those who are successful will be eligible for the Associateship of the Institute,—now a title of much value, as its stamp upon those who receive it at once guarantees their proficiency to their brothers, and to the public, as men upon whom professional reliance may be placed with safety. I congratulate the Society on having arranged this Examination for the convenience of the Liverpool district; and I may say, no better honorary local secretary could be found than Mr. Alfred Culshaw. At his office, 3, Union-cour, I am sure students will find all necessary information. Some may desire preliminary knowledge, and it may be here observed that all this is comprised in the small pamphlet published by the Institute, called "The Examination in Architecture." In it may be found the regulations, programme, and advice to candidates with respect to books, &c., for professional reference and study. There is another small book, issued in 1888 by the Manchester Society of Architects, which I can strongly recommend as a guide to a course of study preparatory to, or in connexion with, these examinations. The librarian of the Free Library has written to say that nearly every book recommended for study by the Royal Institute is in that magnificent collection. Mr. Cowell, the librarian, has been good enough to offer a separate table in his room at the Free Library for the use of those students whose names are entered for this examination. When the candidates get the Examination guides, with list of reference-





RUSHTON HALL.

books, it would be well to suggest the filling-in, opposite their titles,—of the numbers and class letters which those books have prefixed to them in the Free Library catalogue. This will save much time in case of reference. It may be further added that those who are pressed for time can acquire the services of gentlemen who are acquainted with the routine of instruction requisite for this Examination.

As far as the helps to education which this Society affords, I had hopes that in the Class of Design more students would have availed themselves of the opportunity of joining it. After 150 circulars had been sent out to various offices in the town and district, it does seem strange that the response brought back but seven members who sent in competitive designs. I commend this fact to the notice of those who complain about the difficulty of getting gentlemen in practice to attend to the classes. I have read some recent correspondence about these classes, but I must remind our friends that classes in societies like ours, as at present constituted, cannot have the same advantage to the student as those to which paid lecturers are attached. Even the President of the London Architectural Association, in his recent opening address, complains of a falling-off in the attendance at the class meetings. A gentleman, an Associate, has also addressed me on the constitution of the Council, advocating that a proportion of Associates should be allowed to sit as members of the Council. Although this proposal deserves every consideration, I fear this is hardly the time nor the place for its discussion. I heartily sympathise with the interest and zeal which prompt these communications, and I shall lay them before the Council, who in their turn will, I am sure, take them into the serious consideration which they are now giving to the remodelling of the laws which at present govern the Society. On this subject various ideas have been suggested to the Council—one being that Liverpool should imitate Manchester, and have an architectural society, consisting alone of practising architects of a certain standing, leaving the classes to be absorbed in an Architectural Association in combination with the junior members of the profession. However, this at present is merely a dream; but I can say truly that the question of the advancement of the Society is constantly kept before my serious thoughts, and any help I can give to it—and through it to the support of the dignity of the profession, and of the greatest use and assistance to the whole of its members—shall be rendered with all possible pleasure.

In proposing a vote of thanks, Mr. W. H. Hay congratulated the chairman on his interesting address, and suggested it should be printed and circulated amongst the members of the Society.

Mr. T. Cook, in seconding the vote of thanks, touched upon some of the points referred to by the president, amongst which was the question of the right of the Corporation to refuse the renewal of their leases, and the question of sewer ventilation.

Mr. Aldridge, Mr. W. Parslow, and Mr. Mercer all spoke in support of the vote of thanks, which was carried unanimously.

**New Town-hall and Municipal Buildings, Middlesbrough.**—We are informed that the Prince of Wales has consented to visit Middlesbrough in January, for the purpose of opening these buildings, which have been erected from the designs of Mr. G. Gordon Hoskins, F.R.I.B.A., at an estimated cost of 120,000.

The accompanying sketch of this old Hall is given in connexion with our article on the Weldon Stone District in the last number of the *Builder*.—Rushton Hall having been one of the buildings visited, and specially described on the occasion (see p. 297, ante).

### Illustrations.

#### FIRST PREMIATED DESIGN FOR MUNICIPAL OFFICES, BOMBAY.

**W**E give this week reproductions of the two large elevation drawings of Mr. Chisholm's design for the New Municipal Offices, Bombay, which received the first premium in the competition, although, owing to some local tactics concerning which we are hardly in a position to form an independent opinion, his design was ultimately shelved. As no one seems to deny the fact that the design did receive the first premium in an open and regular manner, it is difficult to avoid the conclusion that Mr. Chisholm has not had fair treatment.

The drawings here illustrated were hung in the Royal Academy Exhibition, and we made some criticism on them in reviewing the exhibition, to which Mr. Chisholm, in a letter which was printed in the *Builder* of July 14 this year, objected, as not fairly representing the relation of his design to ancient Hindû work. We now give his expression of his intentions in his design, as taken from the report sent in with the design, a copy of which he has forwarded to us:—

"As the author proposes to adopt a modification of an Eastern phase of art, it may not be out of place to glance briefly at the history of the most remarkable works of Indian Architecture.

In the ancient buildings of Guzerat, Kattywar, and the North-Western Provinces, both religious and civil, we have an art perfect for the purposes for which it was designed, true in principle, exquisite in form, and in the author's opinion, second to no art in the world but that of Ancient Greece. Indian art, like all perfect phases of art, possesses these attributes by virtue of its slow growth, that process which alone admits of the careful selection and rejection of forms by thousands of workmen, patiently toiling on fixed principles for hundreds of years. In early days this art, like most others, was purely religious. When the Mahomedans conquered the country, they were so struck with the exquisite beauty of the Jaina works that they pulled down temples, not to destroy them, but to build them up again piece by piece according to their own fancy; thus, aided by the hands of the same cunning craftsmen, a flexibility was infused into these works which they could not have gained otherwise. New forms sprung up with new requirements, to be adorned by the wealth of ornament perfected by the Jains. They, in their turn, were quick to perceive and adopt in their own works the picturesque phases of Mahomedan art, and thus the two styles became naturally and permanently blended. Later on, in the marble works of Upper India, Italian and Western forms of art began to overlay the pure styles; sound building principles gave way to mere picturesque, until, in such a building as the Taj at Agra, we have a stupendous level in which not architectural truth and skill are lost amid considerations of costliness and effect.

In the design submitted, the author has selected Hindû of a very pure type, merely adding such Mahomedan forms as expediency demanded in positions duly sanctioned by usage. With regard to details, the enthusiastic admirer of old work will be grieved to find many familiar forms omitted or pared down so as to be scarcely recognisable; but this, alas, is inevitable. It would be impossible in these days, and, indeed, scarcely desirable to reproduce archaeological specimens of old work; at

the same time, the author has endeavoured to give the spirit of the past, and to work, not indeed the old giants worked, but rather as they would have worked now, beset with nineteenth-century difficulties.

In both Greek and Hindû architecture, the simple trabecated form of verandah at once affords the maximum of light, air, and shade. It is improbable that the addition of the sunshade to every entablature would have been adopted by Greek architect practising in India; this, however, has the naturally other modifications. A comparison of the two sections of verandah is extremely interesting. Whether the two have had a common origin is probably now beyond the reach of investigation; but that the two can be mixed to produce sublime effects is proved beyond doubt by the remarkable building of this century, the new Court of Justice in Brussels, where we find a European architect earnestly studying the works of the Hindoos, and introducing wholesale Hindû features into Greek art with acknowledged fine effect. It is curious to see this wealth of art, these miscellaneous genius so neglected in their own country. When paying a tribute of gratitude to the eminent architects who have done so much to adorn and beautify Bombay, and who are engaged in forcing so successfully the growth of a northern plant, it may be noted that the present occasion seems peculiarly fitted to turn a kindly eye on the luxuriousness of the tropical glories which surround us.

The author would, of course, concede to the Gothic and Renaissance styles (in suitable climates) a power of expression and refinement of detail unknown to Hindoo art, the result of a more energetic and exhausting process of rejection and selection; but these styles modified to suit an Indian climate are seldom more than skin deep. We have generally a screen work of construction before the building proper; and if this cage or shell were told in any case, in many cases we should discover kernel out of keeping with its shell and not at all architectural. This difference between the nut and the shell invariably receives emphasis by incongruous roofing, flat or pitched as expedient demands. Hindû architecture, on the other hand, naturally possesses the continuity of indigenous architecture, and the external walls by means of the exquisite work, peculiar to the style, may be made to possess any degree of solidity from the slender columns entirely open to the elaborately perforated wall."

We give this as an exposition of Mr. Chisholm's own views in regard to the adoption of indigenous Indian styles for modern Anglo-Indian buildings. Our own opinion on the subject we have given on another page.

#### DESIGN FOR STAINED GLASS, ALDINGTON CHURCH, KENT.

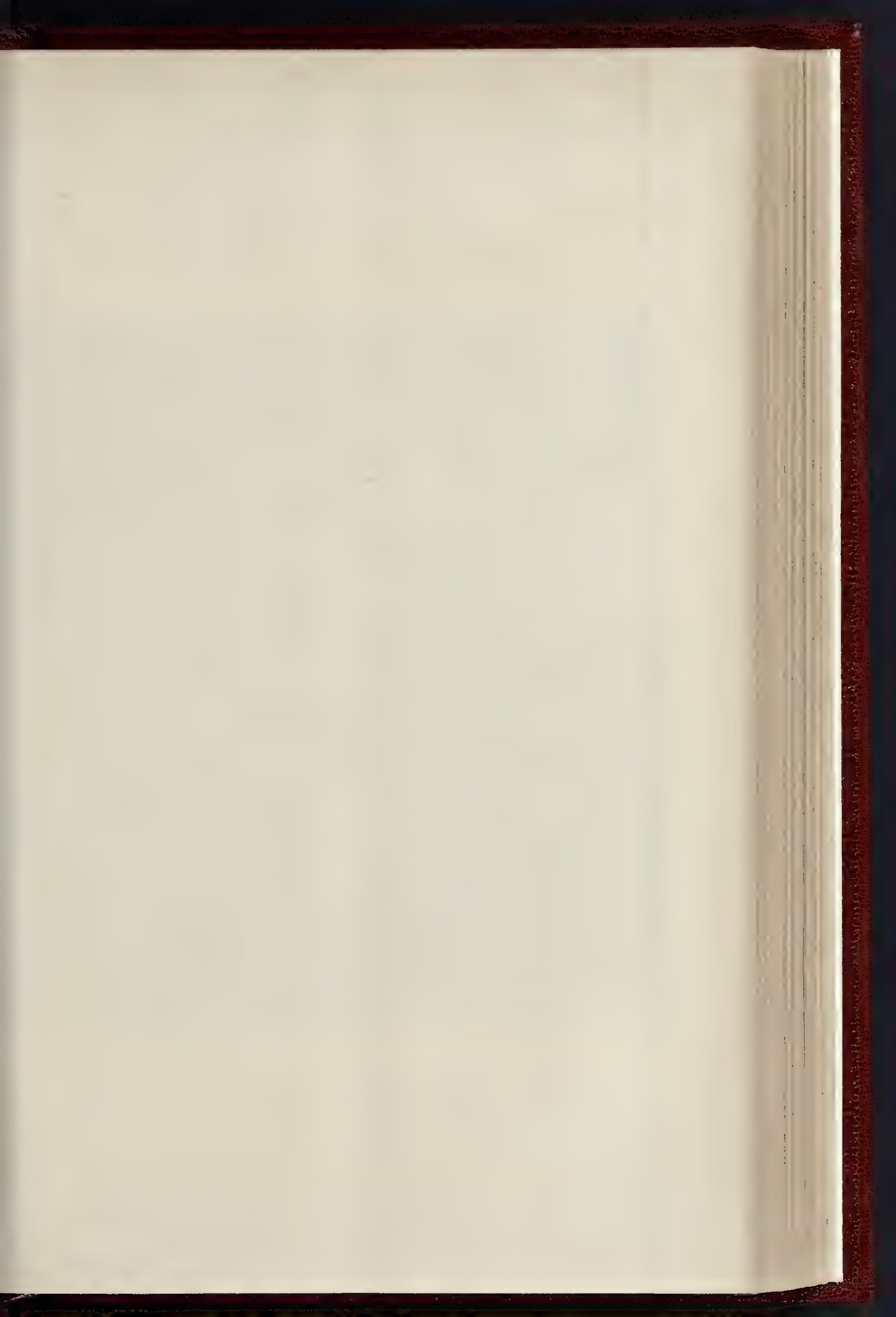
THE design for stained glass which we illustrate is from the cartoon for one light of a two-light window, designed by Messrs. Shrigley & Hunt, for Aldington Church, under the supervision of Mr. Reginald T. Blomfield, as architect.

In general idea, and in the manner in which the wings of the angel are used to form a background to the figure, the design undoubtedly owes a good deal to the influence of Mr. Burne-Jones, though not in the character of the head.

The original drawing, a large-sized cartoon, was exhibited in the Royal Academy this year.

**The Arts and Crafts Exhibition Society** have sent us the following syllabus of lectures in connexion with the Arts and Crafts Exhibition now open, to be given in the North Gallery, on Thursday evenings in November, 8.30 p.m.:—Thursday, November 1, "Tapestry and Carpet Weaving," by Mr. William Morris; Thursday, November 8, "Modelling and Sculpture," by Mr. George Simonds; Thursday, November 15, "Letterpress Printing," by Mr. Emery Walker; Thursday, November 22, "Bookbinding," by Mr. T. J. Cobden-Sanderson; Thursday, November 29, "Design," by Mr. William Morris. Presidential Address, by Mr. Walter Crane. The object of the lectures, we are informed, is two-fold:—(1) to set out the aims of the Society, and (2), by demonstration and otherwise, to direct attention to the processes employed in the arts and crafts, and so to lay a foundation for a just appreciation both of the processes themselves and of their importance in methods of expression in design. The lectures will be given in the North Gallery, and each lecture all the galleries will be thrown open and will remain open till 11 p.m. Admission will be by ticket. For the admission of work in any art or craft, tickets, to be filled in with the name, address, and art or craft of the worker, will be issued at 1s. each, or twenty for 20s., each entitling to admission to a full lecture.





THE BUILDER NOVEMBER 3, 1889



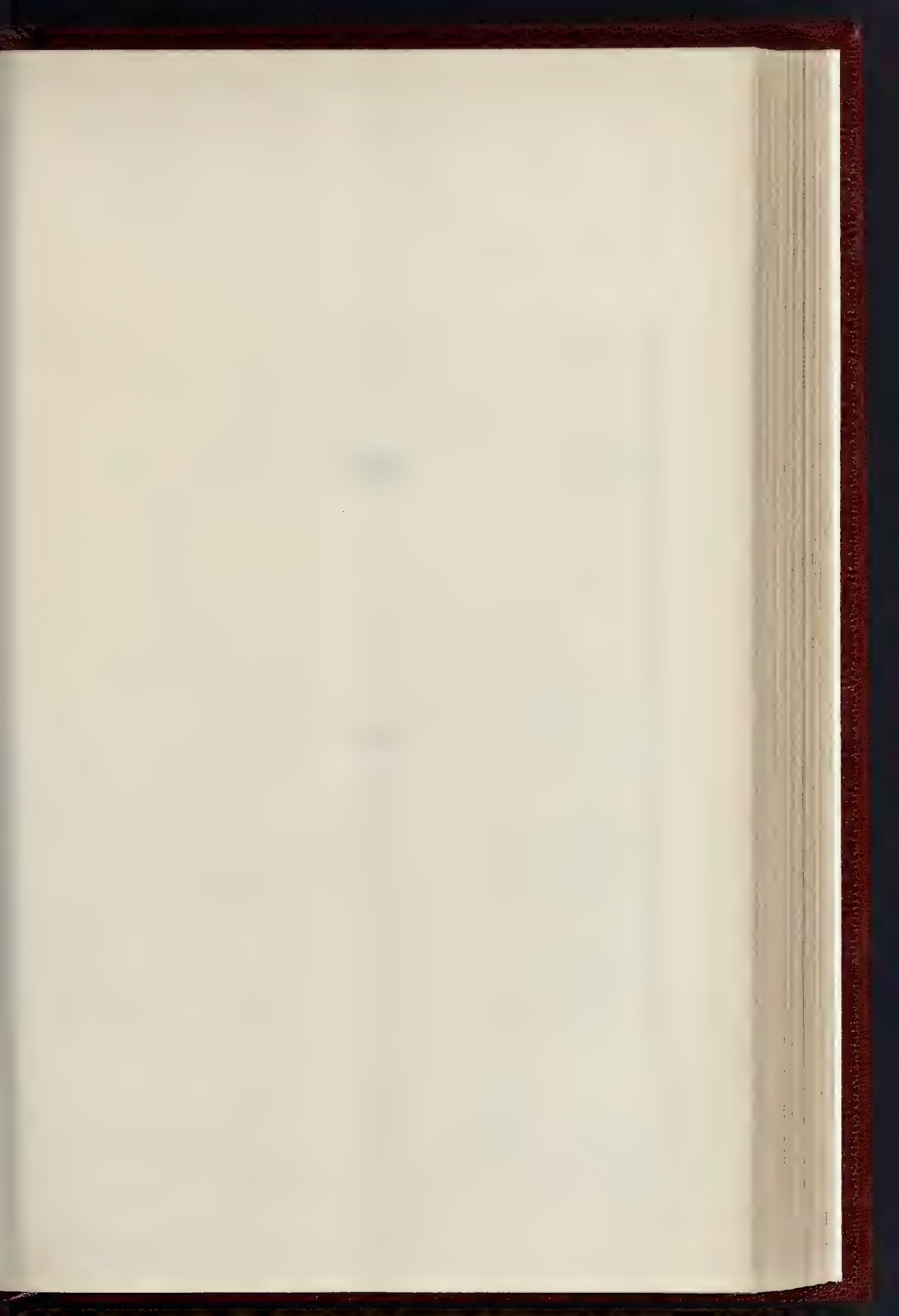


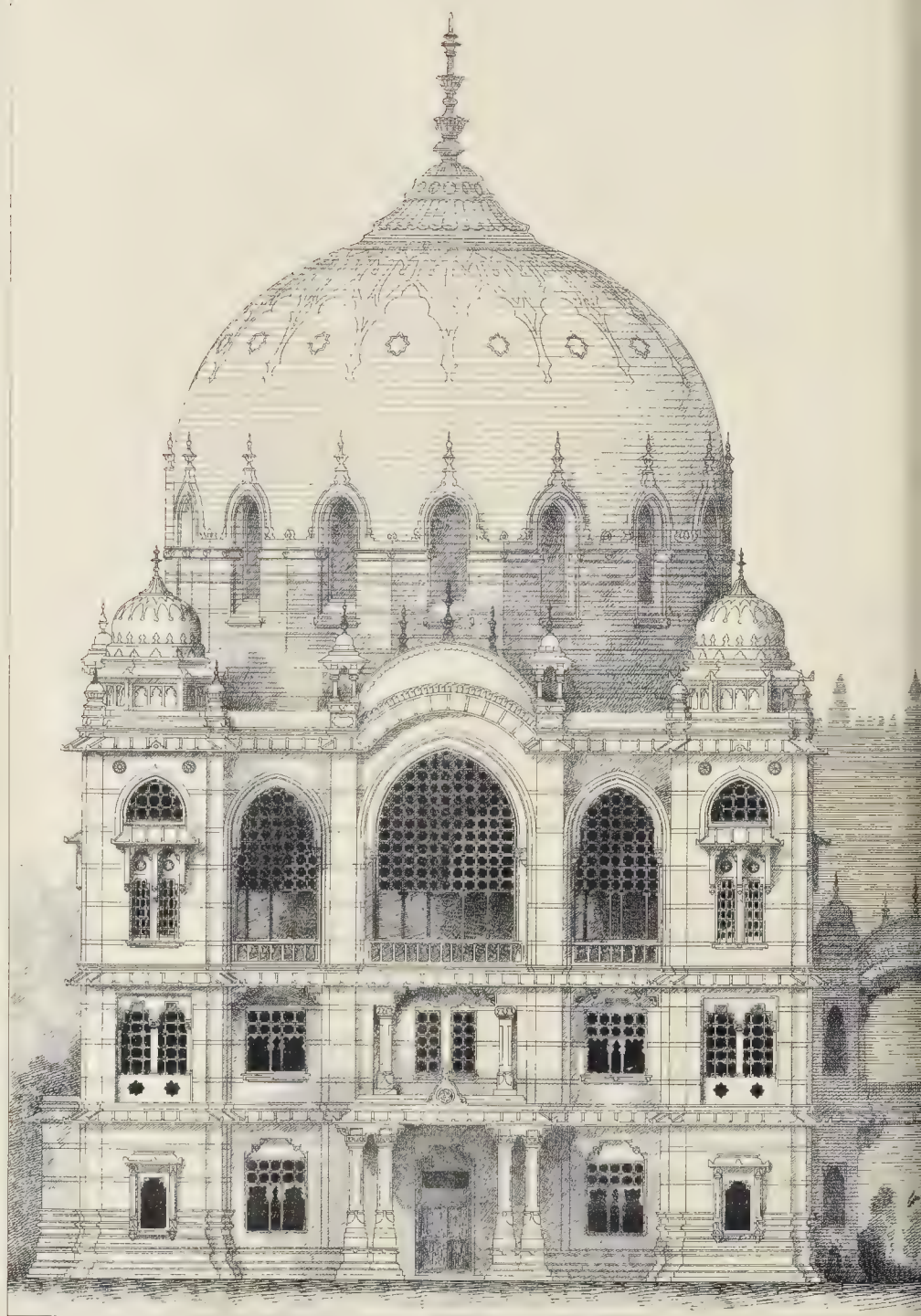


DESIGN FOR STAINED GLASS, ALDINGTON CHURCH, KENT.—By MESSRS. SHRIGLEY AND HUNT.









BOMBAY MUNICIPAL OFFICES COMPETITION; FIRST PREMIATED DESIGN



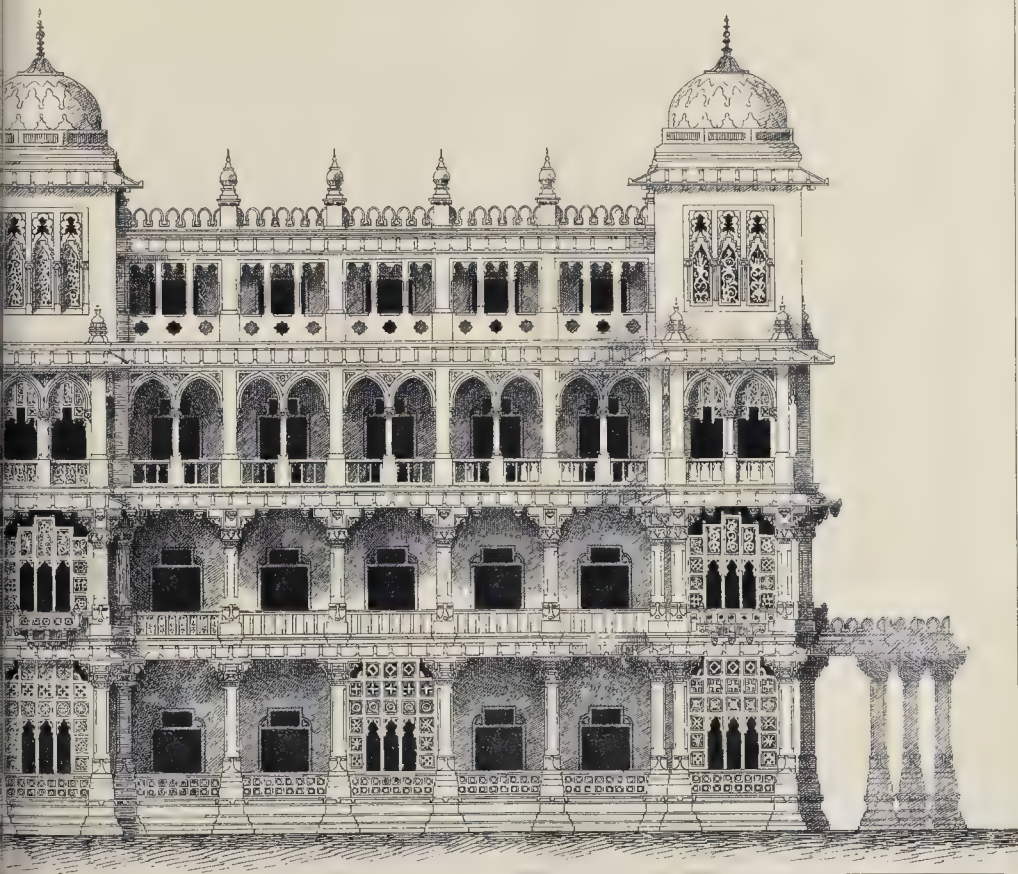
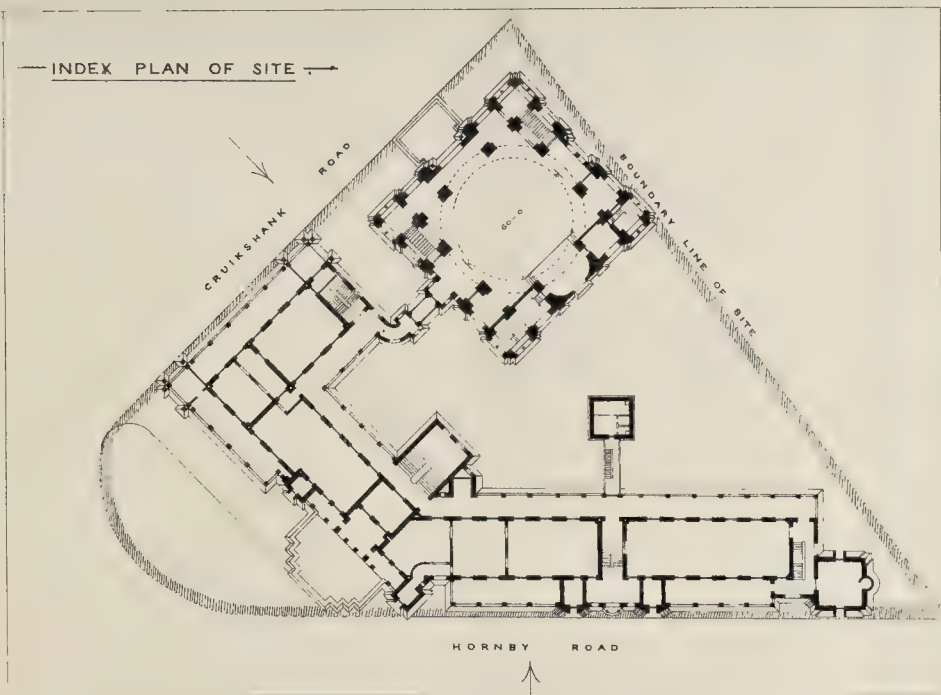


PHOTO LITHO SPRAGUE & CO 22, MARTIN LANE, CANNON ST, LONDON, E.C.





THE IRONMONGERS' COMPANY.

In accordance with ancient custom, the Company of the Worshipful Company of Ironmongers,—one of the twelve great Livery Guilds,—held their St. Luke's day meeting in the Alabaster Hall of the London Tavern, Fenchurch-street. The Warden of the Yeomanry, R. T. C. Noble, presided, and invited the meeting to hear from him a few particulars about the origin, history, and constitution of the Company. In order to further illustrate the subject, a large number of valuable and curious manuscripts, documentary autographs, prints, drawings, and books, were exhibited by Mr. Noble, who gave a brief description of each article, more or less commenting upon its particular rarity or its connection with their story, dividing his discourse into two parts,—the general history of the Guild, and the particular history of the Yeomanry.

The earliest notice of the Ironmongers, as a company, dated back to the year 1351, although their apprentices could be traced back much earlier. The members of the Guild congregated in the neighbourhood of Cheapside and Old Jewry, whence the name of Ironmonger-lane still exists. In 1455, their arms were granted them, as shown in the framed picture and a facsimile of the original document. The supporters to the coat were not adopted until long after, and these would be noticed, were like their crest, two wards, which, rightly or wrongly, were supposed to eat red-hot iron, and easily digest the metal. The site of their present hall was acquired by the Company in 1457, and in 1494 there is a record of "Payd for a kycheheryn of bod ale whiche was drunkeyn in the Frynongers Hall, all charges born 12s. 2d." The hall was rebuilt in 1587, and happily escaped destruction in the Great Fire of 1666, although the surrounding buildings were destroyed. The present Hall was erected early in the last century, and was opened in February, 1750. It was redecorated in papier-mâché in 1847. Among the pictures exhibited by Mr. Noble, are views of the old Hall, a view of Old Fenchurch-street 100 years ago, showing the Hall on one side of the then almost deserted thoroughfare, and immediately facing on the other side the old King's Head tavern, the site of the present magnificent building in which they were then assembled.

The Ironmongers were incorporated by charter in 1463, an emblazoned facsimile of which was exhibited. Mr. Noble remarking that the ancient dress of a liverman might be seen painted in the Leathersellers' charter of 144, and the Barber Surgeons' picture of the time of Henry VIII. Some of the old wills of ironmongers had curious bequests, and of these he had collected together a large number. Robert Byfield, in 1482, directed that sixteen shillings and four tapers were to be carried by twenty poor men at his burial, and each was to give fourpence for his trouble. Alderman Thomas Breton, in 1485, after providing that masses were to be said for his soul, his wife's soul, his relatives', and all Christian souls, for ever, "the fellowship of Ironmongers" were to keep sacred the day of his death for twenty years, and to have four score marks for their trouble. Henry Nevell, exactly 400 years ago his will is dated October 14, 1488, and was proved August 2, 1489) desired to be buried in St. Botolph's Churchyard, and left 6s. 8d. as an offering "in discharge of my soule." Alderman Richard Chamberlyn, in 1563, was good enough to give to his brother Ironmongers £50, to help them out of debts. Another alderman, Richard Gray, in October, 1515, left the Company £500 to perform trusts, which, no doubt, were faithfully fulfilled. John Hudson, in 1513, gave to Roger Smyth twelve pence, "praying you to remember my soule and the soules that I am bound to pray for." Sir William Denham (1558), Sheriff of London, 1534, and many years Master of the Company, left his estates to the Guild, saying, "which I was mynnyd the Ironmongers should have, and all the residue in London and all England or ells where." Alderman Dane, in 1573, left money for loans to young freemen of the Company, and his widow, Margaret Dane, six years later increased the bequest; and also, amongst other bequests, bequeathed to the poor of the twenty-four city wards, "at the best hand, 12,000 faggots verie yere for ever," not, as has been oftenated by sensational writers, to burn heretics with a fire to warm themselves when hunger and poverty stared them in the face. Her bequests are still faithfully administered, under

a Chancery scheme obtained by the Company fifty years ago. About the year 1515, Mr. John Guyva made the Company a present of their funeral pall, or "herse-cloth," formerly used at the burial of members from the Hall, and which will be found described and illustrated in the "Ironmongers' Exhibition Catalogue" (page 454).

As interesting just now, Mr. Noble mentioned that the earliest-recorded Lord Mayor's Show of the Company was that of Sir Christopher Draper, in 1566, and among the craftsmen then engaged were names like those of members at the present time. When Sir James Cambell had his show in 1629 there were men and mermaids, an "ostridge," and among other sights was a forge exhibiting Vulcan hard at work, in his leather apron, plying his hammer at the anvil, amidst the flashing of lightning and the rolling of thunder! He (Mr. Noble) referred his audience to the late Mr. John Nicholl's work for a further account of the Lord Mayor's day of those times.

We understand that it is the intention of Mr. Noble to compile a new history of the Ironmongers' Company, which will also form a record of the progress of the ancient City Guild from earliest times. Mr. Noble has for the last quarter of a century been collecting from records, wills, and private sources, a large number of hitherto unknown details.

A GERMAN TECHNOLOGIST'S VIEW OF SEWAGE IRRIGATION.

DR. J. RUFF, the Editor of the *Gesundheit*, the well-known organ, in Germany, for the advancement of the public health, writing from Stuttgart under date Oct. 20, in reference to a letter recently addressed by Dr. Drysdale to Mr. Charles Hancock (in which Dr. Drysdale says that "Dr. A. Müller has advanced nothing,"—see *Builder*, of Oct. 6,—which can invalidate the opinion expressed by Dr. Koch as to the purity of the effluent from the Berlin sewage-farms and its freedom from noxious germs"), says, "I would refer your correspondent to what Dr. Koch himself has said at the recent annual meeting, held at Frankfurt, of the German Association for the Advancement of the Public Health (Deutscher Verein für Gesundheitspflege). He (Dr. Koch) spoke as follows:—'Even the best of processes at present in use, namely, sewage irrigation, does not attain—even in most favourable circumstances—the objects it is desired to secure.' And for this reason. Whenever there is a stronger rainfall than usual, large masses of non-disinfected matter, more especially faecal matter, must be carried down to the public water-courses through the storm-water overflows (Noch-ablässe)."

"On the subject of clarified water" (Dr. Ruff goes on) "another speaker at the meeting,—I refer to the Town's Architectural Councilor, Herr Bockelberg, of Hanover,—expressed himself in the following way:—'We must not deceive ourselves. The clarified water is, no doubt, clear outwardly speaking, i.e., apparently so, as far as the eye can judge of it, but not in reality, for even after clarification it is still in a dangerous condition for potable purposes.' If (concludes Dr. Ruff) the ardent advocates of sewage irrigation can express themselves in this way, you will quite understand that we who are opponents of the main drainage and sewage irrigation cannot but judge of this system even in a more deprecatory way,—one of our grounds for rejecting it being the waste that obtains of the exceedingly valuable manurial ingredients the sewage contains."

Mr. Hancock, in forwarding this translation, encloses a resolution which was passed by a very large majority at a meeting of the society named, on the motion of Herr Bockelberg, and which was in the following terms:—

"That the society recognises with great interest that progress has been made in the artificial purification of sewage, but remains of opinion that not any single one of these artificial arrangements has proved satisfactory—the important question in particular of the disposal of the sludge not having yet been solved, while the cost of the arrangements referred to is still exceedingly high."

**Builders' Benevolent Institution.**—The annual dinner in aid of the funds of this Institution will be held at Carpenters' Hall, London-wall, on Thursday, the 29th inst.

\* The italics are Dr. Ruff's.

† Translated from the current number of the *Gesundheits-Ingénieur*.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS: EXAMINATIONS.

THE sixth voluntary pass examination of candidates for the offices of Municipal Engineers and Surveyors to Local Boards, carried out by this Association, was held at the Institution of Civil Engineers on Friday and Saturday, the 26th and 27th October. Ten candidates presented themselves for examination, the written portion of which was mostly taken on the first day. The greater portion of the second day was devoted to the *visd voce* portion of the examination.

The examiners were—(1.) For Engineering as applied to Municipal Work, Mr. H. Percy Boulton, M.Inst.C.E. (Borough Engineer, Portsmouth), Vice-President of the Association, and Superintending Examiner. (2.) For Building Construction, Mr. Clement Dunscombe, M.A., M.Inst.C.E. (City Engineer, Liverpool), Member of Council. (3.) For Sanitary Science, Mr. Lewis Angell, M.Inst.C.E., F.R.I.B.A. (Borough Engineer, West Ham), Past President. (4.) For Public Health Law, Mr. Charles Jones, A.M.Inst.C.E. (Surveyor to the Local Board, Ealing, W.), Past President.

We give the written questions (which of course are varied at each examination) in each subject:—

Engineering as Applied to Municipal Work.

1. *Surveying.*—(a) How would you measure the distance of an inaccessible point with the chain only? (b) Describe the method of setting out a right angle with a chain.
2. Explain the "Wells" system for measuring distances with an ordinary dumpy level without the aid of a chain or tape.
3. *Leveling.*—A sewer has a fall of 1 in 375.75, the reduced level at its lower end is 2.05; what would be the reduced level at a distance of 300 yards up the gradient?
4. *Hydraulics.*—What velocity constitutes a self-cleansing flow in a 12-in. pipe sewer? What gradient is necessary to effect this with the sewer running half full, and what proportion does the diameter of sewer bear to its velocity of flow?
5. Describe the process of gauging the flow of water through the V notch.
6. *Drainage and Sewerage.*—Give the essential requisites for a good system of house drainage. Make a sketch of an intercepting-trap with manhole and fresh-air inlet, &c.
7. Describe the precautions that are necessary in the selection of a sea outfall. What are the advantages of tide-locked sewers, and how can they be remedied?
8. *Water Supply.*—Give a sketch section of an ordinary sand-filter bed for a town water supply of about 30,000 inhabitants, and state how many square yards of filtering area are necessary, and the rate at which the water should pass through the filter.
9. Describe a "Positive Meter," "Ball Hydrant," "Straight" and "Bent Ferrule," "Ground Stop-Cock," "Bib-Cock," "Ball-Cock," "Back-Pressure Valve," and "Safety Valve."
10. *Road-Making.*—(a) What contour would you give to a macadamised roadway? (b) What cross fall to the foot-walks if paved with asphalt? (c) What proportionate width should footpaths bear to roadways? (d) What proportionate width should the paved channel bear to a macadamised roadway?
11. Give a sketch section of a kerb, channel, and trapped gully-pit.
12. Give a list of the principal materials which can be used for paving footpaths, and state which you prefer, and your reasons for such preference.

Building Construction, &c.

1. State briefly the general principles to be observed in building with stone and with brick to ensure good work.
2. Describe the following classes of Stone Masonry: Ashlar, Block-in Course, Coursed Rubble, and Common Rubble.
3. What is the difference between coniferous and non-coniferous timber? Classify each, and give examples, and state the respective purposes for which each description is most suitable.
4. State at what age of maturity the following trees attain their greatest strength and durability, viz., Oak, Ash, Elm, Larch, and Fir, the best season for felling them; and the modes adopted for seasoning timber.
5. Describe shortly, and illustrate by a sketch, how you would shore up a dangerous building, 50 ft. in height, fronting a main thoroughfare, and having a frontage thereto of 30 ft., assuming that the front wall is in danger of falling towards the street.
6. Define the following terms referred to in the Model Building Bye-laws:—Basis of Wall, Topmost Story, Party Wall, External Wall, Public Building, Building of the Warehouse class, Domestic Building, Dwelling House.
7. What are the requirements of the Model Bye-Laws with respect to the sufficiency of space about



buildings, to secure a free circulation of air, and with respect to the ventilation of buildings.

8. Draw a Sketch Plan and Section of a Temporary Small-pox Hospital, with its accessories, for six patients, constructed in either Wood and Corrugated Iron or Wood and Willaden Paper; figure thereon floor area and cubical space; describe the preparation of the site, and specify shortly for the respective materials used in its construction and internal finish.

9. What regulations would you propose for the arrangement, construction, and structural working of a New Theatre on the following lines, selecting your own site and dealing with the subject under the following heads:—1st. The means of egress. 2nd. The prevention and isolation of fire. 3rd. The lighting arrangements.

#### Sanitary Science.

1. State, in general terms, the chemical condition of the atmosphere in an overcrowded and ill-ventilated room. In what manner does it act on the physical system?

2. How many cubic feet of air-space should be allowed, per head, in a bedroom?

3. In what manner may drinking-water become contaminated? In what circumstances? What constructive arrangements are necessary to prevent such contamination?

4. What are the requirements of the Model By-Laws with regard to house-drainage? Give a sectional diagram of a three-story house in illustration, showing the drainage thereof connected with a street sewer.

5. What tests would you apply to house-drains to discover any escape of sewer-gas?

6. What are the leading principles in the design of a system of town drainage, of say 50,000 population, having a free river outfall: 1. In a flat district? 2. In a hilly district?

7. What principles govern the ventilation of sewers, and what relation thereto has temperature, gradient, capacity, and volume of flow?

8. Enumerate the best-known processes of sewage treatment at the Outfall, and describe some one in detail, stating, in technical terms, the mechanical and chemical method of procedure and results.

9. State under what respective circumstances a Tank Process, Irrigation, Land Filtration, or a combination of either, may be most desirable.

10. Describe the difference, in principle and action, between Irrigation and Filtration.

#### Public Health Acts and Rivers Pollution Acts.

1. The Public Health Act is divided into several parts. State how many, and give the names of Six Divisions.

2. Give the Titles of the several Acts of Parliament incorporated with the Public Health Act.

3. A Local Authority having undertaken to remove refuse, &c., (a) State the provision of the Act dealing with their neglect of this duty, (b) The number of days specified in the Act as involving a penalty, (c) The penalty incurred.

4. State generally the process set forth in the Act for the Repairing of Private Streets, and under what Section Private Streets may be declared "to be repairable by the inhabitants at large."

5. Give the definition in Act as to "What is to be deemed a New Building?"

6. State the Surveyor's legal duties and position with respect to ruinous or dangerous buildings, and the title of the incorporated Act under which proceedings are taken.

7. State the proceedings to be taken by a Local Authority in dealing with a nuisance outside the district.

8. State shortly the "General Provision" of the Act with reference to contracts.

The results of the Examination are not yet announced.

#### THE QUARTERLY REVIEW ON TECHNICAL EDUCATION.

UNDER the heading "Technical Education and Foreign Competition," the *Quarterly Review* publishes in its current number an interesting article, apparently written with practical experience of the workshop, the main bent of which is to urge that the present bias towards technical education in a scholastic form is a mistake; that technical education in the sense understood by its advocates will not in itself effect the end of enabling English manufacturers to compete on a better terms with those of the Continent; that the best form of technical education is apprenticeship and actual work in the shops. The writer may be one-sided, but he puts his side of the question with considerable force, and it is worth while to give further currency to his argument by reprinting some portion of it in these columns:—

"In July, 1887, the 'National Association for the Promotion of Technical Education' was formed, its purpose being the encouragement of educational reform by legislation, or otherwise. The prospectus of the intended work of the Association is too lengthy for quotation, but it

embraces the promotion of technical training by the teaching of the elements of science, of drawing, the use of tools, and the reform of our system of primary instruction, in order to adapt it to the industrial work of the nation. The Association has organised meetings and lectures, and circulated a large number of tracts and leaflets in furtherance of this object. We have, we think, perused the whole of these, and find the burden of their utterances to be that English trade is going to the dogs for want of technical instruction. We meet with the same well-worn vague generalities; we are told of the marvels which technical instruction will accomplish on our behalf; but for argument, proof, and practical schemes, we search in vain.

We may say, then, speaking broadly, that the efforts of our educational reformers are now being made in two directions: the one, to impart technical and technological education in the elementary schools, both in day and evening classes; the other, to introduce training more practical than that afforded by South Kensington and the City Guilds into the secondary and higher-class schools. The first is in the supposed interests of the artisan; the second in that of the manager, employer, and commercial representative.

Expressed in general terms, the reasons assigned for the need of technical education are that through its neglect we are being beaten in the markets of the world; that the apprenticeship system has broken down, and is practically a thing of the past; that technical schools alone can take its place, and that the condition of the workman himself will be improved in every way by such training. These are, concisely, the arguments, put in various forms, which we meet with in studying the literature of this subject.

We cannot, in the limits of this article, discuss every aspect of the question, nor answer every objection, but we shall deal rather with the broad features, the general aspects of the arguments in favour of technical education. We feel compelled, however, to make special reference to the article of Professor Huxley in the *Nineteenth Century* for February last:—

"We must," he says, "be a nation of shopkeepers under penalty of starvation; and as our customers will naturally seek to get the most and the best they can in exchange for their food-products, our struggle for existence is found in the necessity to make the goods we have to offer better than those offered by our competitors. . . . The old apprenticeship system has broken down. Inventions are constantly changing the face of our industries. The instruction given by the master must therefore be more than replaced by the systematic teaching of the technical school."

We are as deeply impressed as Professor Huxley with the character of a struggle, in which death is the penalty of defeat. But we are also convinced that the bitterness of this internecine war cannot be mitigated by school and college training. Much of our argument will, we think, afford a complete refutation of the Professor's statement; but two plain facts may be just now adduced, by way of showing how fallacious is the idea that in the great bulk, at least, of *artisan's* work, education can exercise any appreciably beneficial influence. We adduce these facts now, because they are of the nature of independent testimony, and they afford a direct reply, as far as they extend, to the empirical remedies proposed for battling with the operation of a cruel law. We admit the struggle, but we deem the remedy altogether inadequate.

Our facts have reference first, to the great superiority of training which is gathered practically in the shops over that gained in technical schools; and, secondly, to the fierceness of the competition arising from the pressure of population on the means of subsistence.

Referring to the Commissioners' Report, they say, speaking of alkali works, "in no country does any real amount of scientific education reach the ordinary workman in alkali works, hence the foreigner has no advantage over us, nor have we any over the foreigner" (vol. i. p. 229). While admitting that managers of Continental alkali works are trained in science better than English managers, they say distinctly that the foreigner is not a "better alkali maker than the Englishman" (p. 230), and they point out that all important improvement in this branch of industry has originated in England. Yet this is a trade which is wholly based on chemical knowledge.

Again, in connexion with some machine and tool works near Zurich, it was represented to the

Commissioners that a 'boy coming to the shop at fourteen becomes, as a rule, a more skilled and valuable artisan than the highly-educated youth coming at twenty' (p. 283). And, 'There are many workmen and foremen possessing practical skill and high scientific knowledge who have not attended a Polytechnic School, and there are some who have enjoyed the fullest advantages of the Polytechnic School who are not only much inferior in practice, but are very deficient in scientific knowledge also' (p. 284). Further: 'Employers in Switzerland stated that it was only by the greatest economy, and an attention to detail which English manufacturers would not trouble themselves with, that Switzerland could face the competition of England and other foreign countries' (p. 283).

Speaking of German cotton-spinning, the proprietor of a cotton factory in one of the Rhine Provinces admitted that he could buy English yarns cheaper than any spun in Germany. Yet his men worked seventy-two hours per week, and received lower wages than Lancashire operatives, while to the cost of the English yarns would be added that of carriage, packing, and import duty (p. 295).

Testimonials similar to these could be multiplied both from the Commissioners' Reports and from the weekly technical journals; and they more than outweigh a far larger number of vague generalities, too often repeated at second hand. But these will suffice just now to show that it is not yet proven that technical training, in the sense in which its advocates understand it, will aid us in a struggle where labour is so divided and machinery so universal, that the artisan's duties are nearly as automatic as the operations of the mechanism that he superintends.

A fact, the full force of which Professor Huxley as a biologist will admit, is the multiplication of individuals beyond the means of subsistence. The influence on work and wages of this too rapid increase, coupled with pauper immigration, is fully apparent in Mr. Burnett's 'Report to the Board of Trade on the Sweating System at the East-end of London.' The whole Report reads to us like a bitter mockery of the panacea of Technical Education—a running commentary on the 'severity of a competition, in which those who can subsist on least are sure to be victorious.' Mr. Burnett avers that 'the supply of cheap labour has of late years been enormous, and when there was the slightest difficulty in obtaining it at the prices offered, there was no difficulty in obtaining more people from abroad.' The men and women in the sweaters' dens work from fourteen to sixteen hours a day. 'The tea half-hour is in many cases not allowed at all. If a female worker were to insist upon a regular half-hour for tea, she would be sent about her business.'

It will enable us to obtain a clearer idea of the scope of this question if we endeavour, from a matter-of-fact point of view, to ascertain the true conditions of *paying* work. For this is really what the whole question resolves itself into—even according to the showing of the advocates of technical education—it is simply one of successful competition, that is, of *paying* trade, which of course puts on one side all considerations of a purely intellectual character, the higher training of the mind, and so forth. It is *technical*, not *general*, education which is in question—that training by virtue of which a man shall be qualified to do his work in the *best* manner, in the *shortest* possible space of time. Keeping this essential fact clearly in view, the matter is very much simplified.

Now, it will be admitted that the education which is adapted for one craftsman is not suitable for another. An engineering draughtsman's training, for example, involves the study of the principles of mechanics, of mathematics, geometry, and the actual work of drawing. A knowledge of these things is absolutely necessary before a man can earn his living at all as a mechanical draughtsman, and he, by the special study of these subjects, qualifies himself for the special business of his life. The necessity becomes thus the incentive to the acquisition of the knowledge. Or, taking an engine-fitter—his special training lies in this, that he must understand the drawings from which he has to work, that he shall be able to execute any piece of work submitted to him in a proper manner, and effect such a union of parts, according to the design and the materials provided, that a perfect machine is the result. Unless he can do these things, read a drawing, handle the chisel, file, scrape, screw taps, &c., with celerity and accuracy, he cannot earn his living in that sphere; and here, again, necessity



comes the incentive to the development of the mind. The founder has to understand the nature of his moulding-sands, and the different qualities of metal, the venting of moulds, the conditions of pressure, pouring, and so forth. The pattern-maker, again, has to master the drawings, the manipulation of wood-working tools, and the principles of moulding. The metal-turner or the machinist must learn the best angles of his cuttings, and their adaptation to the different materials which he has to shape. The boiler-maker or smith must know the nature and mode of treatment of the different qualities of iron or steel which have to be welded, rolled, punched, or riveted. In each of these departments, therefore, the education required is different from that in any other department. Though each of these is comprised under the generic head of 'engineering,' each nevertheless demands knowledge of so very distinct and special a character that the workmen are separated from each other; they have to spend several years in acquiring the knowledge necessary to the exercise of their craft, and they never work in any department save their own; and without that special knowledge they cannot earn their living as workmen. Hence we conclude that the only technical education which is of any value is that which is acquired in the shops. But then this is synonymous with a learning of the trade, or with *apprenticeship*, and therefore we hold that no amount of theoretical education can compensate in the least degree for the lack of that special skill which can be acquired by apprenticeship alone. Euclid will not enable a man to file a surface more true in less time than another who has not studied Euclid. Algebra will not aid a founder to separate and pour his mould more efficiently than a fellow-workman alongside who has not mastered the mysterious symbols. And that which does not aid, often tends to hinder, by producing a distraction of mind, leading the thoughts away to subjects lying outside the range of daily toil. Not that we consider some intellectual distraction amidst the eternal dullness of the workshop an evil; but we are following strictly the lines of our argument, that intellectual knowledge, mental equipment, will no case take the place of practical skill, nor a man to do his work *cheaper or better*. And his skill, we maintain, is to be gathered in the shops, and if not acquired there, it can be obtained in no other way.

That man, then, is technically trained who has learned his trade thoroughly, even though he might be unable to obtain a certificate of merit in any scholastic or scientific examination. And if the practice of the complex branches of engineer's work can be better acquired in a workshop than in a technical school, certainly then the training of the latter will be of even less value in those numerous occupations in which little skill is wanted.

It may be objected that we have omitted all mention of certain subjects, some knowledge of which must inevitably be required in workshops, such as the principles of mechanics, geometry, chemistry, hydrostatics, strength of materials, and others kindred thereto. But people who insist on this show considerable ignorance of the conditions under which workshop practice is carried out at the present time. Men are not "skilled hands, if you like, but nothing more; and, being such, these subjects would, if required, be forgotten for want of use. One may be a good workman, and work during many years in a good shop, and not once during many years may he have occasion to put to practical use any single important fact in either of these branches of science other than that which has come to him in a matter-of-fact way during the acquisition of his trade. A founder instinctively knows how to load his flasks without going into estimates of liquid pressure. An erector knows that a load of a certain size should carry safely without calculation. A smith learns the qualities of his iron and steel, as affecting questions of suitable heat for forging and welding, without making analysis of its chemical composition. As much knowledge of these and kindred subjects as is necessary to the proper accomplishment of good work comes naturally in the course of practical training. A man of ordinary ability cannot spend several years in a shop in the earnest practice of one section of handiwork without acquiring, in a very matter-of-fact sort of way, a knowledge of as much scientific truth as is requisite for that practice, the penalty for not knowing being mistakes and disgrace. Moreover, a technically-educated man, meaning by that, one who has

mastered the text-books only, would be immensely more at fault than an uncultured but practical and observant workman, because, although the first might reason and calculate with strict precision as taught by text-books, he would in nine times out of ten, perhaps, fail to take account of those modifying practical conditions which would invalidate all his calculations. Without the least hesitation, let us say that we would far rather entrust the execution of a difficult piece of work to a man who scarcely ever opened a book, than to one who, though highly trained in theory, had not worked during many years in the shops. It is the latter man who would blunder.

But it is said that the establishment of workshops in conjunction with collegiate institutions will furnish the higher kind of technical training that is desirable. Assuming, for the sake of argument, that such training is desirable, how can more specialised knowledge be gathered in these than in the regular shops? There is about as much similarity between the workshops attached to these colleges, where pupils play at engineering, and the actual shops where the work of the world is done, as there is between an amateur mechanic's room and a factory. In the college workshop, time counts for nothing; in the factory, it is of the first importance. In the one, the work is of a uniform, straightforward, experimental, and dilettante character; in the other it is done under circumstances of haste and difficulty, frequently without precedent—under ever-varying conditions, and competition—the prime purpose being the making of a substantial profit. In the college, tasks of the most varied character are performed under the guidance of a single teacher or demonstrator, while in the factory each leader is a man who is skilled in one department only. Therefore the collegiate establishments do not conform to the conditions of actual work; and, such being the case, have so limited a value that they can never have any influence in turning back the tide of foreign competition.

In the training of engineers' articulated pupils in the factory, the conditions necessary for the acquisition of practical skill are much more favourable than in the technological school. These pupils spend six months, twelve months, two years continuously in a single department or workshop, the whole of each day being devoted entirely to the acquisition of that one branch. Moreover, the pupils are always youths who have had a good grounding in elementary and secondary schools, often also in collegiate institutions, almost invariably possessing such knowledge of classical and modern languages, mathematics, and the leading principles of science, as youths are able to master before the ages of sixteen or seventeen. They are invariably, too, lads whose physical development is good; so that, with a sound mind in a sound body, they are able to assimilate knowledge under more advantageous conditions than the children of the artisan classes. Now, the most which can be said of the pupils who receive instruction under such favourable circumstances is that, with a very few bright exceptions, they would be quite unable to earn their living afterwards as second-rate craftsmen. Of course it must be understood that they do not come into the shops expecting or intending ever to live by manual labour, they want to gather a general knowledge only of the business throughout. But the fact remains, and this applies with equal or greater force to evening artisan classes, that it is impossible for anyone of average ability to master the mysteries of an intricate craft in the course of two or three sessions, even under practical teachers fully qualified for their work. If pupils, who have enjoyed the best advantages of elementary and secondary education, who work in shops surrounded by skilled workmen, 'where iron sharpeneth iron,' and amidst machines and operations of the most multifarious character, cannot acquire a trade in less than four or five years, how can youths, who employ only two or three sessions in technical schools, hope to become more skillful than the men who, without preliminary training, have stuck doggedly to the bench, the forge, the vice, throughout the regulation term of apprenticeship? There is no royal road to the learning of handiwork. . . .

The point then at which we arrive is this, that the so-called technical education, by which it is proposed to supplement shop training, can never have any appreciable effect on British trade. The broad difference between this aspect of the question and the one which it is intended to combat, is that the first regards the

workshop as the true training school, and the second proposes a training *outside* of the shops, on the basis of a more or less technological education.

In a matter of such moment as this, it is well to have very clear ideas of the point at issue. We will now, therefore, say definitely that we look to apprenticeships as furnishing the true training of a skilful craftsman for his life work. It seems like giving utterance to a truism to say this, yet the value of apprenticeship is in danger of being lost sight of. We have plainly told the system has broken down. We admit this is the case in many trades where, owing to the division of labour and the introduction of machinery, little or no training is required; but for the present we must be understood as speaking only of those occupations where the highest skill and most painstaking efforts are still essential. In these it is certain that no technical training of a pseudo-scholastic character can ever take the place of apprenticeship.

The system dates from the establishment of the craft guilds of the Middle Ages. No person was admitted a member of the guilds who had not served an apprenticeship, commonly lasting in England for seven years, but on the Continent for lesser periods. Ultimately the usage of centuries was codified by the Statute of Apprentices, 5 Elizabeth, c. 4. With the growth of the factory system, during the latter portion of the eighteenth and the commencement of the nineteenth centuries, the masters made strenuous efforts, first to evade the provisions of the Statute, and then to get it repealed. In 1814 they succeeded, by 54 George III., c. 96, in obtaining its abrogation for all trades, save those in London; and since that time, though the practice has been retained in many of the trades where high skill is essential, it is not compulsory, and the arrangement often takes the form of a verbal agreement only.

In a large number of shops, therefore, probably in the majority, no apprentices are now taken; for two reasons, one being that more boys can be passed through the shops in a given time, the term of non-indentured service being often less than the old-fashioned seven years, the other being that lads who are not indentured give less trouble to the employers than those who are regularly bound, because the first can be discharged for misbehaviour. There is, in consequence, a loosening of the bond which formerly subsisted between the employer and those who come to his shops to learn their trade. And whereas in years past, under the old indenture system, the apprentices were taught directly by their 'master'—in every case a true craftsman, who had also gone through his period of apprenticeship—they are now placed under the charge of a foreman or of a leading hand, who has no personal interest or pride in their advancement, but whose interest is very often really identically with practice which becomes a deterrent to the lad's advancement; in other words, it often *pays* best to keep a youth at a certain section of work at which he has become proficient, rather than pass him on to learn another section in the same department. And, as a matter of fact, the employer in one of our modern mammoth establishments barely knows his lads by sight, probably never speaks to one of them, except, perhaps, to send him to fetch the foreman or manager. This lamentable estrangement, which prevails in our big establishments, is a great evil, and is one cause of the lack of skill which we deplore in a section of our workmen. As lads they have never been trained, because it has been nobody's business to teach them, while in some cases the very narrowness of their occupation has been their master's gain. In a more thorough conscientious training of lads during the years of their apprenticeship, lies, as far as the higher crafts are concerned, the remedy for the foreign competition so much dreaded."

**The Drying-up of the Zuider Zee.**—A Rotterdam correspondent states that the project of drying-up the Zuider Zee, of which so much was heard a little while ago, has apparently stranded, the *entrepreneurs* being unable to raise the capital required. However, the task of ascertaining the nature of the soil at the bottom is being proceeded with.

**A Lady Architect.**—A Finnish lady has obtained the sanction of the Senate of Finland to enter the School of Architectural Teaching at Tammerfors, for the purpose of studying architecture.



### ARCHITECTURAL ALTERATIONS AND ADDITIONS IN OXFORD.

CONSIDERABLE architectural additions have been made in Oxford during the past year, the most important of which are thus described by the *Oxford University Herald* :—

"The chief building being erected, of course, is that of Mansfield College, which is likely to be ready for occupation early in next year. The buildings are grouped, forming three sides of a quadrangle. The President's house and library block, which are connected by the west wing; the lecture-room block, tower, and dining-hall block form the south side, having a frontage of about 180 ft., the tower being nearly central; the chapel forms the east side of the quadrangle. The whole of the stone for the exterior elevations is Taynton, from quarries at Milton; for inside dressings Corsham Down has been used. The slating is by the Naunton slates, which harmonises well with the stonework. The architect is Mr. Basil Champneys, B.A., of Buckingham-street, Strand; the general contractors, Messrs. Parnell & Sons, of Rugby.—At Trinity College, the new President's house has been completed, the principal doorway of which is in the centre of the south front. The architect is Mr. Jackson, and the gables are varied with the scalloped ornaments conspicuous in several of this architect's recent works in the city.—At Magdalen College, the residence of the Principal has been finished, the south front of which is most effective.—The new tutors' residence in connexion with University College has lately been completed. The house is built on the site of the old *Herald* printing-offices, and adjoins the College Library. Mr. Moore is the architect, and the work has been well carried out.—Considerable progress has been made with the new block of Brasenose College facing High-street, between Radcliffe-lane and Amsterdam-court, and when finished it will be a striking addition to the architectural features of High-street. The present structure consists of a new house for the Principal and five sets for undergraduates, an imposing tower being placed at the west-end, beyond which there will eventually be an extension. The front elevation may be described as fifteenth-century Perpendicular, and will be 42 ft. in height from the ground-line to the roof-ridge. The tower will be 62 ft. in height, and under it is the main entrance, formed with a fine Tudor archway, with a groined roof, leading into Amsterdam-quadrangle. The cost is estimated at about 12,000*l*. Mr. T. G. Jackson, of London, is the architect.—A massive block of building has been added to Hertford College. It is of Classic architecture, corresponding with the old wings on either side; it is, however, more elaborate in design. The new block comprises a kitchen and office in the basement; a porter's lodge, a set of undergraduates' rooms, a bursary, and a buttery on the ground floor; and on the first floor there is a dining-hall and a serving-room, these being approached by a broad flight of moulded Portland steps. The front entrance gateway is well designed. There are fluted columns with carved capitals on each side, and the ornamentations are worthy of inspection. Upon entering the archway into the quadrangle and turning to the left is found a beautifully-designed staircase, which is very unique, and octagonal in shape; while on the right and left of the entrance archway, leading from the quadrangle into Catherine-street, is a column with moulded bases, and capitals with pedimented head. Cliphsham and Doulton stone have been used for the exterior of the building. The architect is Mr. T. G. Jackson. It is anticipated that the work will be completed about Christmas.—There has been a very extensive restoration to the stonework on the north and south side of Merton College Chapel. The tracery panels in the buttress have been carefully reinstated.—The building for the Delegacy of Unattached Students has been completed, but we have recently given some account of this addition to the High.

Amongst the more important miscellaneous work may be mentioned a new lodge at the north end of the University Museum grounds. It is built of stone, and is a very picturesque little building. Mr. Moore is the architect.—A new wing is being built at the Hospital for Incurables, which is to contain patients' rooms and a temporary chapel. Mr. Parsons, of London, is the architect.—A new mission chapel is to be erected on the north corner of Charles-street, Cowley St. John, and excavations have already been commenced. The plans were pre-

pared by Mr. Mardon Mowbray.—At Osney Bridge, the work, which has been much hindered by difficulties with the foundation, is now approaching completion.—Considerable alteration and improvements have been made by the Local Board in the matter of widening and laying out new streets, and many business houses have undergone alterations."

### CASE UNDER THE METROPOLITAN BUILDING ACT.

At the Westminster Police Court, the Royal Aquarium and Winter Garden Society (Limited) were summoned before Mr. Partridge, by Mr. E. D. Drury, District Surveyor, for an alleged infringement of the Metropolitan Building Act, 1855, by re-covering a portion of the roof of the Aquarium, situate in Westminster (formerly consisting of glass), with a combustible material. Mr. W. Dovey-Smyth appeared, on behalf of the Company, for the defence.

Mr. Drury, in opening the case, gave evidence that he discovered, on the 18th of June last, that the roof of the Aquarium was being covered in place of the glass with a material known as "Patent Wire Wove Roofing," the material consisted of a close wire mesh, the interstices being filled with a gelatinous, semi-transparent, oily substance, in the opinion of witnesses highly inflammable. He gave notice for the work to be discontinued, but it was proceeded with and finished. An appeal was made to the Metropolitan Board of Works, and they decided, after hearing both sides, in favour of the contention of the District Surveyor. The new material might have some advantage over glass, but the heat which would break glass would probably burn the new material. (Mr. Smyth disputed this, and to test the matter a piece of the stuff was ignited. It burnt slowly at the sides, but not in the middle.)

In answer to Mr. Smyth, Mr. Drury said he was not aware that Colonel Majendie, the Government Inspector, approved the material, or that it was used over powder magazines and at all the recent Exhibitions.

Mr. Smyth said it would cost the Company over 2,000*l*. to make any alteration now. Their defence was consent and acquiescence on the part of the District Surveyor's representative to use the material, and that the same was in every respect safer than glass.

Evidence was given in support. The scientific witnesses stated that there was no possibility of the Aquarium roof taking fire, and that the fire risk had been much lessened since the employment of the patent material, and that the same was used at the Colonial, American, and Irish Exhibitions.

Mr. Partridge said it was proved the company had availed themselves of a most valuable and useful invention. Mr. Drury, no doubt, took up the case in the interests of the public, but the summons might safely be withdrawn.

Mr. Drury refused to do this, and the matter was adjourned until the 30th ult.

Upon the adjourned hearing, Mr. Smyth called Mr. Walter Emden, architect, Mr. G. Harkfoot, railway surveyor, Mr. G. H. Harrison, civil engineer, and other witnesses, whose evidence went to show that the material was practically fireproof; and, after hearing these witnesses, Mr. Partridge dismissed the summons.

Notice of appeal has been lodged.

### PAVING APPORTIONMENTS.

At the Dalston Police Court on Tuesday, Messrs. T. J. Marshall & Co., of Campbell Works, Stoke Newington, were summoned by the Hackney Board of Works for 54*l*. 2*s*. 1*d*. ordered to be paid by them by an order of apportionment made by the Board in respect of the cost of paving a road known as Chapel-road, Stamford Hill, and which the Board alleged was a "new street" within the meaning of the Metropolitan Management Amendment Act, 1862, Section 112.

Mr. C. E. Jackson, solicitor, defended. The defence was that Chapel-road, formerly known as Birdcage-walk, had, previously to the passing of the said Act, been taken into charge by the authorities having control of the pavements or highways in the parish of Hackney; and that, therefore, the Act did not apply to this case.

Mr. William Lewis, an old inhabitant of the neighbourhood, proved that he remembered Chapel-road being maintained by the parish for the last thirty years, and that there had been houses during that period along the greater part of one side of the road.

Mr. James Lovegrove, C.E., the Surveyor to the Board, corroborated this, stating that the Board had repaired the road ever since he was appointed in 1856, and that the defendant's property upon which the paving claim was being made was then old property.

Mr. John Hamilton, surveyor to the defendants, proved by the production of Ordnance maps that the property in respect of which the claim was made was in existence before the passing of the Act, and in the same state as it is at present.

The Magistrate said that, considering the evidence before him, he should decide that Chapel-road was not a "new street" within the meaning of the Act.

The summons was therefore dismissed.

### THE EPIDEMIC OF DIPHTHERIA AT MIDSOMER NORTON.

SIR,—Whatever may be the cause of the outbreak of diphtheria at this place, I beg to be allowed to state that I do not agree with what Mr. Reeves says on p. 308 about the ventilation of sewers, and about "excessive friction" causing traps to be siphoned, "and sewer-gas of the worst kind forced into dwellings." Now, what traps does he mean that are siphoned? There ought to be a disconnected ventilating trap nowadays between every house and the sewer, which trap ought to protect both the house and its drains and pipes from the sewer air, gases, &c. Further, even supposing that some of these disconnecting traps were occasionally unserviceable, if the drains were right the sewer air should not get into the house, but get exit outside of it. Before it is astonishing the ignorance that still exists amongst many tradesmen regarding drainage work, while, if it is an estimate job, there will scamp in every way they can. The letter of Mr. Reeves on p. 308 does not seem to me to exhibit much knowledge of the subject, either theoretically or practically.

Glasgow, Oct. 29, 1888.

W. P. BUCHAN.

### The Student's Column.

#### ARTIFICIAL STONES.—XVIII.

Stones made with the Assistance of Alkaline Silicates (continued).

ELLIS's artificial stone, patented in 1856, was composed of powdered marble shells, porphyry, granite, calcine bones, malachite, freestone, or other natural and suitable substances, mixed with lime or a solution of soluble glass, so as to form a plastic compound, which is then moulded with or without pressure, according to the purpose for which it is required.

Ott's stone, said to resemble the best quality of Portland stone, is an American production, and is formed of a mixture of hydraulic cement, lime, and soluble silicious earth, water-glass, to which is added powdered dolomite which has been heated up to 50° Fahr. the mass having been well kneaded, is pressed into moulds and dried.

Barff prepared artificial stone in 1861 from a mixture of silicate of soda, powdered pumice and dry white-lead. The compound pressed into moulds becomes very hard and insoluble. Coombe and Wright, about the same time, proposed to utilise the freshly-precipitated silica, obtained in the production of the hydrofluosilicic acid employed in their patent process for preserving stone,\* and the same patentees also proposed to use the acid itself for forming stone by admixture with lime, chalk, or other suitable material.

J. P. Weimar patented in 1862 an artificial marble composed of flint, granite, fire-clay, chert, quartz, and other material, mixed with soluble glass in various proportions, stirred to pulp and poured into moulds of plaster of Paris. H. Ellis suggested the addition of newly-precipitated silica, or compounds obtained by the addition of borax, phosphate of soda, chromate of potash, &c., to the ordinary soluble silica solution; this mixture was to be employed in the manufacture of stones by adding to it a suitable earthy or stony matters, and burning the shaped articles. Thomas's patent, 1862, might also be included in the section in which the utilisation of residuals and by-products is discussed. According to this process, artificial stone is to be made from the waste of the alkali maker, and the oxide iron from burnt pyrites, mixed with soluble silicate. Shellinger's pavement flags, which have been used with some success in New York, are composed of a mixture of 10 parts of coarse sand, and 1 of cement with gravel pebbles, &c., as required; this basis is pressed into moulds, and covered with a fine compound.

\* See *Builder*, June 18, 1887, article "Preservation of Stone."



made up of 2 parts of pure sand, 1 cement, and 1 of any metallic oxide or coloring matter; when nearly dry the stone is dried with soluble glass.

In 1863 a patent was obtained by F. de Wylde, making artificial stone from the usual reagents mixed with silicate of soda, and with solution of an aluminum compound. A New York patentee, in 1866, utilised the rent property of sugar to obtain a lime-acting solution, to which was to be added soda, so that a copious precipitate of silicate of lime was thrown down, which might be used alone or in combination with gypsum, alk. sand, cement, &c., in the manufacture of artificial stone.

In 1868 and 1869, the Rev. H. Highton, M.A., obtained his two patents which led up to the successful manufacture of the largely employed Victoria Stone or Silicated Concrete. They may be thus briefly summarised:—No. 2,045 for its object the production of slabs or bricks from good hydraulic cement, which were to be soaked in a solution of soluble glass containing freshly-precipitated or other soluble lime in solution; the 1869 patent (No. 1,384) solved the use of sand, gravel, or other hard matter, which were to be added to the ingredients mentioned in the preceding patent, and the stone might also, in order to preserve it, be brushed over with paraffin or solution of gum. The really essential point about Highton's process is the use of a bath of alkaline silicate, which is placed free silica, so that as lime reacts silica to form the desired silicate, the silicate alkali set free immediately dissolves in the added silica to re-form silicate, which in its turn is decomposed by a fresh quantity of lime; so that theoretically a small quantity of caustic alkali should serve to convey an indefinite amount of silica to the lime, but, of course, in practical work there must be a gradual loss and absorption of alkali.

The patent Victoria stone, which has been in use for years past, is produced chiefly from the waste of the Groy granite quarries, which are carefully crushed, mixed with tested and carefully crushed Portland cement, soaked in the silicate solution already referred to, dried, and washed. The stone formed is of good colour, and hard enough. The granite of the quarries mentioned produces better results than most other stones, a result attributed to the fact that it is shales in a more granular or angular manner, so that the particles bind better with the cement than do the majority of granites and other hard stones, which have a tendency to shatter in flaky particles on being broken up. In 1871, proposed the utilisation of waste lime, by combining it with a cement silicate or other salts and lime, or with a silicious mixture.

In 1884 Thompson & Bryant patented a stone which was formed of crushed granite chippings, 50 per cent.; Portland cement, 15 per cent.; shed iron slag, 40 per cent.; silicate of soda, 5 per cent.; and water, 20 per cent.

RECENT PATENTS.

5,114, Pile-drivers. G. Sonnenenthal. The main feature of the improvement which is the object of this invention consists in constructing the iron or tripod of the apparatus of wrought-iron or tubes, in such manner that it can be easily towed and lowered, and readily taken to pieces. The parts are also altered in form with the view of affording greater portability. The legs, which are in form, are fixed by extending the parts, fitting a clamp or ring over the lap joint, making secure.

5,509, Warming and Ventilating. R. Oakley. Provides for heating incoming air for ventilating purposes in winter time by means of gas, and for drying off the products of combustion safely and actively. The air is admitted from the outside, through a channel which is heated by gas-jets. The apparatus is fixed outside the building, and is portable, so that it can be removed in the summer time.

708, Fireproof Curtains, Panelling, Slabs, &c. T. B. Lee. Asbestos fibre is mixed with concrete or cement, with finely-broken slag or broken fire-brick. It is in while the mixtures are in a semi-liquid form, and helps to bind the mass together. When set into blocks, it is used as a fireproof theatre slab.

135, Ladders, Fire-Escapes, or Steps. W. Chell. These ladders are constructed in two or more pieces, and are pivoted or hinged together at each

jointure by bolts in the top sides of the lowest section, and in the bottom side of the second and subsequent sections. Safety-pins are also attached for greater security.

10,770, Improved Door - Fastener. H. L. Hind.

An iron hasp is made with two projections at one end and an oblong slot at the other, through which an iron wedge is made to fit, the same being attached to the hasp by a small piece of chain. The hasp is placed on the door-jamb, and the door forced to. This drives the spikes into the sill or door-frame. The iron wedge is then pushed into the slot, and no one can open the door without great violence.

10,955, Door Stops and Closers. H. H. Schou.

This is a device to prevent the slamming of doors, which will also act as a buffer-stop to arrest the movement of the door and allow the same to close quietly. It is actuated by springs, and forms in one device a door-closer and stop.

12,107, Door Closer, &c. J. H. Bean, and W. Gaines.

This closer operates by means of atmospheric pressure and compression. Hinged horns are fixed on each side of the piston-rod and casing, and the door is carried in a shoe, the apparatus being fixed in the floor. By special mechanism the door is held steady in a closed position, and not blown open by draughts, &c.

NEW APPLICATIONS FOR PATENTS.

Oct. 19.—15,022, R. White and P. Ayton, Door Furniture.—15,061, G. Kenrick, Hinge.

Oct. 20.—15,123, L. Muller, Door-plates, &c.

Oct. 22.—15,136, E. Cairn, Weather Strips for Doors.—15,152, J. Denham, Brick-machines.—15,168, A. Bradley, Fire-saws.—15,176, L. Teale, Fireplaces.—15,178, A. Robinson, Apparatus in Combination with Water-waste Preventors.

Oct. 23.—15,202, I. Shone, Sewer or Drain Flushing Traps.—15,203, I. Shone, Ventilation of Drains and Sewers.—15,223, S. Russell, Metal Lathing.—15,236, J. Dewrance and B. Church, Cementing Asbestos.—15,243, J. and W. Witte, Door Springs.—15,246, W. Thompson, Ventilators.—15,251, S. Grossmith, Automatic Flushing Cisterns.—15,267, H. Budge and F. Jackson, Device for Preventing the Opening of Doors.

Oct. 24.—15,272, F. Bantlin and C. Nolte, Over-moulds.—15,277, J. Millar, Discharge and Overflow for Baths, Lavatories, &c.

Oct. 25.—15,355, D. Richmond, Drain-traps.—15,379, J. Hargreaves and A. Armitage, Fire Grates.—15,389, A. Winrow, Pressing or Stamping Tiles or Bricks.

PROVISIONAL SPECIFICATIONS ACCEPTED.

11,392, W. Price and E. Webb, Gas-lighting, Warming, and Ventilating.—12,017 and 12,018, H. Ramsay, Composite Water-tight Pipe-joints.—12,174, C. Young, Lock, &c., with Bolts for Doors, &c.—12,470, C. Falconer, Framing Sash Windows, Doors, &c.—12,553, G. Bellingham, Alarm Fastenings for Doors and Windows.—12,660, T. Secker, Automatic Door-holder.—12,946, T. Line and J. Davenny, Wallcoats and Linings for Walls, Ceilings, &c.—13,424, F. Baynes, Open Register Stoves, &c.—13,553, W. Charlesworth, Window-fastenings.—13,696, G. Scott, Brick-kilns Fired by Gas.—15,735, J. Archer, Roofing Material, &c.—13,809, J. Wilson and A. Richardson, Window-sashes.—13,977, A. Del Guerra, Opening and Closing Window-sashes.—14,175, L. Pichery, Stone-working, Slate, and Marble Tools, and Holders.—14,198, S. Smith, Combined Ventilator and Gas Bracket for Walls.—14,338, W. Wilkie, Ventilators.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,061, R. Reeves, Construction and Ventilation of Soil-pipes, House-drains, &c.—16,697, J. Davies, Fastening Door or other Handles to Spindles.—17,588, H. Ball, Opening and Closing Fanlights, &c.—17,606, C. Straub, Well-Covering Composition.—18,532, T. Crapper, Disconnecting Traps for Sanitary purposes.—19,490, T. De Cobi, Fastening Window-sashes.—13,476, J. Wilson and L. Constantine, Veneers.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

|                                                                     |        |
|---------------------------------------------------------------------|--------|
| Oct. 22.                                                            |        |
| By A. CHANCELLOR.                                                   |        |
| Barnes—The freehold residence, "Milbourne House" .....              | £1,420 |
| By H. A. L. BACS.                                                   |        |
| Highbury—52, Grosvenor-road, 61 years, ground-rent 28. 8s. ....     | 550    |
| By C. C. TAYLOR & SON.                                              |        |
| Mile-end—20 and 21, Beaumont-square, 40 years, ground-rent 49 ..... | 515    |
| 14, 19, and 18, Woolley-street, 12 years, ground-rent 29 .....      | 200    |
| 13, Holford-street, 40 years, ground-rent 22. 15s. ....             | 290    |
| 26, Norfolk-street, 35 years, ground-rent 22. 12s. 6d. ....         | 255    |
| 1, Dudley-terrace, 79 years, ground-rent 24 .....                   | 240    |
| Stepney-green—19, Copley-street, 54 years, ground-rent 28 .....     | 250    |

|                                                                          |       |
|--------------------------------------------------------------------------|-------|
| Oct. 23.                                                                 |       |
| By H. W. SAPPILL and ELVONSTRAY & SON.                                   |       |
| Wishet, near The Hundreds Farm, containing 102a. 2r. 3p., freehold ..... | 1,800 |
| Upwell, Norfolk—Freehold land, 14a. 2r. 34p. ....                        | 370   |
| Lower Corner Farm, 147a. or. 34p. ....                                   | 3,009 |

|                                                                         |       |
|-------------------------------------------------------------------------|-------|
| By DENNETT, TAYSON, & CO.                                               |       |
| Marylebone—9 to 13, Hereford-street, 35 years, ground-rent 215 .....    | 1,400 |
| An improved ground-rent of £75, term 32 years .....                     | 950   |
| Islington—102 to 104, Upper-street, 25 years, ground-rent 285 .....     | 2,750 |
| 227 to 230, Upper-street, copyhold .....                                | 8,095 |
| An improved rental of £102 a year, term 30 years .....                  | 780   |
| 291, 293, and 295, New North-road, 30 years, ground-rent 215. 10s. .... | 580   |
| 207, New North-road, 30 years, ground-rent 1d. ....                     | 270   |
| An improved rental of £50, term 20 years .....                          | 610   |
| Commercial-road East—No. 167, term 18 years, ground-rent 24. 18s. ....  | 270   |
| City—215, Whitecross-street, freehold .....                             | 1,010 |
| Woodford, Church-end—Five copyhold cottages ..                          | 1,250 |

|                                                               |        |
|---------------------------------------------------------------|--------|
| By THURGOOD & MARTIN.                                         |        |
| East Croydon—"Heath Lodge," and 47a. 3r. 15p., freehold ..... | 14,000 |
| A freehold plot of land .....                                 | 600    |
| An enclosure of land, 5a. or. 15p., freehold .....            | 350    |

|                                                                                       |       |
|---------------------------------------------------------------------------------------|-------|
| By FRANK JOLLY & CO.                                                                  |       |
| Lower Clapton—111, Rushmore-road, 88 years, ground-rent 42 .....                      | 185   |
| By TURNER, PATER, & TURNER.                                                           |       |
| Russell-square—30, Montague-place, and stabling, 12 years, ground-rent £31. 10s. .... | 770   |
| West India Dock-road—Business premises, with plant, &c., and goodwill .....           | 2,110 |
| Poplar—The lease, goodwill, and plant, &c., carried on at 1 and 2, King-street .....  | 150   |
| No. 55, West India Dock-road, part freehold and part copyhold .....                   | 800   |

|                                                               |       |
|---------------------------------------------------------------|-------|
| Oct. 25.                                                      |       |
| By BROWN, ROBERTS, RADMAILL, & CO.                            |       |
| City—Moorgate-street-chambers, freehold, area 1,900 ft. ....  | 8,850 |
| Borough—23 and 24, Essex-street, freehold .....               | 1,120 |
| By H. STAINES.                                                |       |
| Homerton—17, Ballance-road, 71 years, ground-rent 24 .....    | 209   |
| Bow—6, St. Stephen's-road, 65 years, ground-rent 24. 4s. .... | 305   |

|                                                                  |       |
|------------------------------------------------------------------|-------|
| By E. STRICKS.                                                   |       |
| Peckham—34 and 36, Stanbury-road, 57 years, ground-rent 49 ..... | 540   |
| 65, Lausanne-road, 80 years, ground-rent 25 .....                | 250   |
| Walworth-road No. 260, term 60 years, ground-rent 214 .....      | 1,430 |
| 6, South-street, 73 years, ground-rent 27 .....                  | 345   |
| New Cross-road—The freehold residence, "Oak Hall House" .....    | 1,200 |
| 1, 3, and 5, Benson-street, 60 years, ground-rent 49 .....       | 365   |
| Clapham-road—22, Oval-road, 35 years, ground-rent 24. 15s. ....  | 250   |

|                                                                    |     |
|--------------------------------------------------------------------|-----|
| By C. C. & T. MOORE.                                               |     |
| Bow—57 and 69, Thomas-street, 88 years, ground-rent 65 .....       | 400 |
| Limehouse—40, Lockley-street, 71 years, ground-rent 4s. 4d. ....   | 310 |
| Plaistow—Freehold ground-rents of £43, reversion in 88 years ..... | 820 |

|                                        |     |
|----------------------------------------|-----|
| By GLASIER & SON.                      |     |
| Strand—3, George-court, freehold ..... | 780 |

|                                                              |     |
|--------------------------------------------------------------|-----|
| By F. J. BIRLEY.                                             |     |
| Rotherhithe 59, Albion-street, freehold .....                | 320 |
| 15 and 40, Clarence-street, freehold .....                   | 350 |
| 9 and 10, Robinson-place, 29 years, ground-rent £2. 8s. .... | 250 |
| 13 and 15, Forsyth-street, 73 years, ground-rent 24 .....    | 250 |
| 28 to 35 odd, Verney-road, 89 years, ground-rent £0 .....    | 600 |
| 40, Rotherhithe-street, freehold .....                       | 265 |

|                                                      |       |
|------------------------------------------------------|-------|
| By P. D. TUCKER (at Bonford Road).                   |       |
| Plaistow Hall Estate—46 plots of freehold land ..... | 1,743 |

MEETINGS.

SATURDAY, NOVEMBER 3.  
Association of Public Sanitary Inspectors.—Annual address by the Chairman (Mr. Hugh Alexander). 6 p.m.

MONDAY, NOVEMBER 5.  
Royal Institute of British Architects.—The President (Mr. Alfred Waterhouse, R.A.) will deliver the opening address of the session. 8 p.m.  
Society of Engineers.—Mr. H. Ross Hooper on "The Practice of Foundry Work." 7.30 p.m.  
Clerks of Works' Association (Carpenters' Hall).—8 p.m.

TUESDAY, NOVEMBER 6.  
Manchester Architectural Association.—Address by the President (Mr. A. H. Davies-Colley). 7.30 p.m.  
Glasgow Architectural Association.—Mr. A. E. Scott, on "Perspective."  
Society of Biblical Archaeology.—Papers by the President (Mr. F. le Page Renoult), and Mr. E. A. Wallis Budge, M.A. 8 p.m.

WEDNESDAY, NOVEMBER 7.  
Builders' Foremen and Clerks of Works' Institution.—8.30 p.m.

THURSDAY, NOVEMBER 8.  
Arts and Crafts Exhibition Society.—Mr. George Simonds on "Modelling and Sculpture." 8.30 p.m.  
Society of Telegraph-Engineers and Electricians.—Mr. W. Laist Carpenter, B.A., B.Sc., on "Ocean Temperatures in Relation to Submarine Cables." 8 p.m.

Import of Granite to St. Petersburg.—A large quantity of granite is now being imported to St. Petersburg for the work of paving the principal thoroughfares with this material, now carried on in the Russian capital. The stone comes chiefly from Finland and Scandinavia, but the quarry-owners in the latter countries have a difficulty in competing with the Finnish ones, as Finnish stone does not pay duty.



## Miscellanea.

**New Buildings for the Dairy Supply Company.**—At the corner of Little Russell-street and Duke-street, Bloomsbury, an extensive block of new buildings is approaching completion for the Dairy Supply Company, on a site which has been leased from the Duke of Bedford, and which covers an area of about 4,000 ft. The buildings contain four main floors, with a fifth floor in the mansard roof. The two elevations are in stock brick, relieved with red bricks and Portland-stone dressings. The principal entrance is in Duke-street, the Little Russell-street frontage containing an archway leading into the interior of the building for the passage of carts and vans. In the basement and on the ground-floor there are large washhouses and dairies. Both these floors are lined throughout with glazed bricks, as well as the soffit of the flat fireproof ceiling. Above the first-floor windows is cut in stone the title of the company. In the upper floors of the building there are several suites of rooms for the employees of the company. The staircase is in Green Moor stone, and the walls and corridors have a coloured glazed brick dado. Each floor is provided with w.c.s., coal-boxes, dust-shoots, and pantries. The corridors are all fire-proof, and finished with Messrs. Homan & Rodgers's metallic pavement. On the top-most floor there will be a laundry, furnished with coppers, washing-troughs, &c. The roof is also fire-proof, and above it an asphalted flat for the use of the inmates, protected by parapets and iron railings. The architect of the building is Mr. R. P. Whellock, of Finsbury-pavement, and the general contractors are Messrs. J. Allen & Sons, of Kilburn. Messrs. Doulton & Co., of Lambeth, will carry out the sanitary work. Messrs. Measures Bros. are supplying the iron-work. The estimated cost of the building, when finished, is 12,000*l*.

**The Tallest Chimney in the World.**—Referring to the paragraph, "A Tall Chimney," in the *Builder* of October 27, it appears that we were quite right in limiting the statement as to the chimney in question by saying that it was "described by American papers" as the tallest in the world; since it appears that although the chimney referred to, that of the Clark Thread Company, Newark, New Jersey, 335 ft. high, is the tallest chimney in the United States, it is exceeded by over 100 ft. in height by the Townsend Chimney, Port Dundas, Glasgow, which is 454 ft. high, and is thus the tallest chimney in existence. Two other high stacks are those of St. Rollox, Glasgow, 436 ft., and Dobson & Barlow's, Bolton, 367 ft. high. But these three chimneys were built for carrying off noxious fumes from chemical works, whereas the Clark chimney is built for the purpose of creating a draught for steam-boiler furnaces, having an aggregate capacity of 4,000 horse-power. While on this subject, it may be mentioned that another high chimney is being constructed at Freiberg, Saxony, intended to carry off blast-furnace gases at the Freiberg Muldenhütter. This chimney rises from a base 39 ft. 4 in. square, and will end at a height of 443 ft. in a circular section 10 ft. in diameter. The cost of the Freiberg chimney is 115,000 marks (5,750*l*).

**Barnard's Inn Hall.**—Mr. Walter Crane informs us that the Art Worker's Guild have become the tenants of the ancient hall of Barnard's Inn, Holborn, with its court-room and offices, and that it will be available, on certain conditions, for the meetings of other societies, literary, artistic, antiquarian, or debating. The premises, we are informed, have been put in repair by the Art Workers' Guild, and can be inspected on application to the hon. secretary to the house committee, Mr. Reginald T. Blomfield, 39, Woburn-square, Bloomsbury, W.C.

**The Sunday Society.**—The Committee of the Sunday Society announce that the Arts and Crafts Exhibition Society have consented to the opening of their Exhibition on Sundays, November 4 and 18, between the hours of 3 p.m. and 9 p.m. The Exhibition will accordingly be opened on the Sundays named. The admission will be free by ticket, to be had of the honorary secretary of the Sunday Society.

**The Sanitary Institute.**—At a meeting of the Council of this Institute, held on the 25th ult., Sir Douglas Galton, K.C.B., F.R.S., in the chair, thirty-eight Members and Associates were enrolled.

**Accident at Millbrook Church, Bedfordshire.**—Monday's *Standard* contained the following paragraph:—"A curious scene was witnessed at the parish church of Millbrook, Bedfordshire, yesterday, when, in consequence of the body of the church being in a state of wreck, through a portion of the walls and roof having fallen a day or two previously, a number of people gathered together in the chancel, which remains intact, and partook of the Holy Communion. It was, however, found impossible to conduct the ordinary services there, and these were afterwards held in the parish room. A funeral took place on Saturday afternoon, and the coffin had to be deposited in the chancel while the Burial Service was being held. It appears that the rector, the Rev. F. L. Sharpin, had, along with the churchwardens, resolved to introduce a new heating apparatus into the building, and the workmen were engaged in making the necessary excavations in the nave, when one of the massive octagonal-shaped pillars separating the nave from the aisles gave way at the foundation, which simply consisted of sand. Four men were in the pit, but they observed the stones begin to move, and made a rush for the door. They had, however, a very narrow escape, for they had only reached the porch when the pillar collapsed and fell into the hole where they had been working, bringing with it two of the arches and a large piece of the roof. A number of the old oak panes were smashed, and the font, which was a very ancient relic, was broken into fragments; but three marble busts, standing on pedestals close by, being those of Lord and Lady Holland and Lady Ann Fox, who were formerly connected with the parish, were untouched. The church is a beautiful edifice in the Perpendicular style, and is one of the oldest in Bedfordshire."

**The English Iron Trade.**—There is comparatively little change in the English iron market, which remains steady on the whole, with a larger amount of business doing in manufactured iron and steel than in crude material. Pig-iron is not so strong in Cleveland and Scotland, but in Lancashire and Staffordshire, as well as in Wales, there is no giving way, owing to a strong demand, while the hematite iron trade in the north-west is fully and actively maintained. Scotch warrants have gone down in value during the week, and there has also been some trifling cutting-down in Scotch makers' quotations; Middlesbrough iron is also not quite so firm as it was; Bessemer iron, on the contrary, has gained 3d. per ton on the week. In Lancashire and Staffordshire sales are made at late firm rates. The demand for finished iron keeps up its standard of activity, and the trade is very healthy, with prices showing still an upward tendency. Notwithstanding the pressure applied by American buyers, tinplates keep very firm. The steel market is characterised by great briskness, and quotations for plates and angles are more stiffly held than ever, but there is a difficulty in getting better prices for other descriptions of steel. Shipbuilders continue as busy as ever, and there is increasing activity amongst engineers.—*Iron.*

**The Registration of Plumbers.**—At the Examination of Plumbers for Registration, just held at the City and Guilds Institute, applicants were present from several towns of North and South Wales, from Somerset, Stafford, and Hants, as well as from various parts of London and neighbourhood. The examinations embraced tests of joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house fittings, and the principles of sanitation. The examiners were Messrs. Hudson, Webb, Mills, Clarke, and Lyle, the two last representing the Plumbing Classes at the Polytechnic and the United Operative Plumbers' Association respectively. Just half the number of applicants succeeded in passing the examinations.—At a meeting at the Guildhall on the 29th ult., the Plumbers' Company issued their Certificates of Registration to plumbers from Bath, Battle, Brighton, Brynmawr, Burnham, Cardiff, Chester, Chippenham, Egham, Emsworth, Halifax, Hereford, Kirby Lonsdale, Landport, Manchester, Salisbury, Sheffield, and Southampton.

**The Sanitary State of Madrid.**—The *Epoca* states that the death-rate of Madrid has increased so greatly during the last few years, —being now twice that of London,—that the Spanish Government has decided upon some radical reforms. Among them are an improved system of drainage, the laying out of open spaces for public parks, the establishment of public baths, improved hospitals, &c.

**Sale of Topographical and Architectural Works.**—Some uncommon copies of certain standard works were sold last week. Messrs. Hodgson's rooms in Chancery-lane. The prices realised were as follows:—"Godwin's 'Churches of London' (1838), an excellent copy on large paper, 13*s*.; Britton & Pugin's 'Public Buildings of London,' with all the plates, large paper (1825), 7*s*.; Cox's 'Annals of St. Helen's Bishopsgate' (1876), 10*s*.; Howitt's 'Northampton Heights of London,' 8*v*o., inlaid to royal size, and extended to three portly volumes; the insertion of portraits, views, cuttings, autograph letters, and the like, 13*s*.; similar Grangerised and companion copies of Lewis' 'History of St. Mary, Islington' (1842), two volumes, 8*s*.; Park's 'Topography and Natural History of Hampstead' (1814), 6*s*.; Tomlinson's 'Perambulation of Islington' (1858), 4*l*. 12*s*. 6d.; Nelson's 'History, Topography, and Antiquities of St. Mary, Islington' (1811), 3*l*. 7*s*. 6d.; and Palmer's 'History of St. Pancras' (1870), many of the views on India paper, 3*l*. 3*s*. a set of Lyson's 'Environ's,' and 'Middlesex Parishes' was bought for three guineas. Owen Jones and Jules Goupy's 'Albambra' having many of the lithographs in gold and colours, two volumes, elephant folio size, on large paper, somewhat foxed, 4*l*. 17*s*. 6d.; and J. W. Clark's 'Cambridge with etchings on India paper, and vignettes of all artists' proofs, by A. Brunet-Debaines, 10*s*. Toussaint, and G. Greux, folio, of which only fifty copies were printed (1881), 2*l*. 10*s*. The works of Camden, Strutt, Dugdale, Leland, and Stakely, as well as those of Sheraton, Parker, Neale, Britton, Pugin, Isabelle, Brayley, &c., others, were richly represented.

**The Leeds and Yorkshire Architectural Society.**—We have received the syllabus of lectures, &c., in connexion with this Society for the present session. It is as follows:—Nov. 1, President's Address and Distribution of Prizes. Nov. 26, "Furniture and Woodwork of the Seventeenth Century," with illustrations; by Mr. Arthur Marshall, A.R.I.B.A. Dec. 10, "Beauty in Colour and Form: how to seek, where to find," by Mr. J. Aldam Heaton. Jan. 7, 1889, "Art Metamorphosis," by Mr. J. Starkie Gardiner. Jan. 27, "Architects of the English Renaissance," by Mr. Reginald T. Blomfield, M.A. Feb. 4, "Plea for Old English Art," by Mr. Robt. Johnson, F.R.I.B.A. Feb. 18, "Interior Decoration and Furniture," by Miss A. Garrold (London). March 4, "Colour in Architecture as Interior Decorations," by Mr. Wm Scott Morton. March 18, "Canterbury Cathedral," by Mr. Hadfield, F.R.I.B.A. April 29, Secretary's Report; Election of Officers.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |           | £. | s. | d. | 2 <i>s</i> . |
|----------------------------------------------|-----------|----|----|----|--------------|
| Teak, E.I.                                   | load      | 8  | 0  | 0  | 12 10        |
| Sesquiu, U.S.                                | foot cube | 0  | 2  | 3  | 0            |
| Birch, Canada                                | load      | 2  | 15 | 0  | 15           |
| Fir, Dantisc                                 | load      | 2  | 0  | 0  | 4            |
| Oak                                          | load      | 2  | 0  | 0  | 4            |
| Canada                                       | load      | 4  | 0  | 0  | 10           |
| Fine, Canada red                             | load      | 2  | 10 | 0  | 3            |
| Canada                                       | yellow    | 2  | 10 | 0  | 4            |
| Lath, Dantisc                                | fathom    | 3  | 10 | 0  | 5            |
| St. Petersburg                               | load      | 5  | 0  | 0  | 0            |
| Walnut, Odessa, crown                        | load      | 2  | 10 | 0  | 3            |
| Deals, Finland, 2nd and 1st                  | std. 100  | 7  | 0  | 0  | 10           |
| " 4th and 3rd                                | std.      | 7  | 0  | 0  | 9            |
| Riga                                         | std.      | 8  | 0  | 0  | 8            |
| St. Petersburg, 1st yellow                   | std.      | 9  | 10 | 0  | 15           |
| " 2nd                                        | std.      | 9  | 0  | 0  | 10           |
| " white                                      | std.      | 7  | 10 | 0  | 10           |
| Swedish                                      | std.      | 7  | 10 | 0  | 10           |
| White Sea                                    | std.      | 8  | 0  | 0  | 17           |
| Canada, Pine, 1st                            | std.      | 18 | 0  | 0  | 25           |
| " 2nd                                        | std.      | 10 | 10 | 0  | 17           |
| " 3rd, &c.                                   | std.      | 7  | 10 | 0  | 10           |
| Canada, Spruce, 1st                          | std.      | 9  | 0  | 0  | 10           |
| " 3rd and 2nd                                | std.      | 7  | 0  | 0  | 10           |
| New Brunswick, &c.                           | std.      | 6  | 10 | 0  | 8            |
| Baltic, the kinds                            | std.      | 0  | 2  | 0  | 12           |
| Flooring Boards, sq., 1 in., prepared, First | std.      | 0  | 11 | 0  | 0 14         |
| Second                                       | std.      | 0  | 8  | 0  | 0 10         |
| Other qualities                              | std.      | 0  | 5  | 0  | 0 7          |
| Cedar, Cuba                                  | std.      | 0  | 0  | 3  | 0 0          |
| Honduras, &c.                                | std.      | 0  | 0  | 3  | 0 0          |
| Australian                                   | std.      | 0  | 0  | 4  | 0 0          |
| Mahogany, Cuba                               | std.      | 0  | 0  | 4  | 0 0          |
| St. Domingo, cargo average                   | std.      | 0  | 0  | 4  | 0 0          |
| Mexican                                      | std.      | 0  | 0  | 4  | 0 0          |
| Tobacco                                      | std.      | 0  | 0  | 4  | 0 0          |
| Honduras                                     | std.      | 0  | 0  | 4  | 0 0          |
| Box, Turkey                                  | std.      | 6  | 0  | 0  | 12 0         |
| Walnut, Italian                              | std.      | 0  | 0  | 4  | 0 0          |

## METALS.

|                            |     |    |    |   |    |   |
|----------------------------|-----|----|----|---|----|---|
| Iron—Bar, Welsh, in London | ton | 4  | 17 | 6 | 5  | 0 |
| " at works in Wales        | ton | 4  | 7  | 6 | 4  | 0 |
| " Staffordshire, in London | ton | 5  | 15 | 0 | 7  | 0 |
| Copper—                    |     |    |    |   |    |   |
| British, cake and ingot    | ton | 80 | 0  | 0 | 81 | 0 |
| Best selected              | ton | 81 | 10 | 0 | 82 | 0 |
| Sheets, strong             | ton | 88 | 0  | 0 | 88 | 0 |
| Chili, bars                | ton | 78 | 5  | 0 | 80 | 0 |



| METALS (continued).    | £. s. d. | £. s. d. |
|------------------------|----------|----------|
| ow METAL.....lb.       | 0 0 7½   | 0 0 7½   |
| Spanish.....ton        | 13 10 0  | 0 0 0    |
| Spanish brands.....ton | 0 0 0    | 0 0 0    |
| at, English.....ton    | 14 15 0  | 0 0 0    |
| at, special.....ton    | 19 0 0   | 19 2 6   |
| inary brands.....ton   | 18 17 6  | 19 0 0   |
| ices.....ton           | 104 0 0  | 0 0 0    |
| iton.....ton           | 103 0 0  | 0 0 0    |
| itralian.....ton       | 103 0 0  | 0 0 0    |
| ish ingots.....ton     | 105 0 0  | 0 0 0    |
| English sheet.....ton  | 23 10 0  | 23 10 0  |

## COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

### COMPETITION.

| Nature of Work.                        | By whom required.                      | Premium.  | Designs to be delivered. | Page. |
|----------------------------------------|----------------------------------------|-----------|--------------------------|-------|
| ations to Present Chapel or New Chapel | Merthyr Tydfil Metho. Church Bldg Com. | 10l. 10s. | Jan. 1st                 | ii.   |

### CONTRACTS.

| Nature of Work, or Materials.        | By whom required.                                            | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|--------------------------------------|--------------------------------------------------------------|-----------------------------------|--------------------------|-------|
| al Repairs.....                      | 'School Bld. for London St. Margaret, (West-ministry) Vestry | Official                          | Nov. 7th                 | xi.   |
| Paving.....                          | The Committee Backenham Local Bd.                            | G. R. W. Wheeler                  | do.                      | xi.   |
| Re construction, Church, Southampton | Wickham Local Bd.                                            | W. H. Mitchell                    | Nov. 12th                | xi.   |
| ing and Paving Works.....            | Lewisham Bd. of Works                                        | G. B. Carlton                     | Nov. 13th                | xi.   |
| ing, Tar-paving, &c.....             | Fulham Vestry                                                | O. Claude Robson                  | Nov. 13th                | xi.   |
| making and Paving Works.....         | Fulham Vestry                                                | J. P. Norrington                  | Nov. 14th                | xii.  |
| inking, &c.....                      | Hastings Union                                               | P. H. Tree                        | Nov. 15th                | xi.   |
| ground Crinals, Water Closets, &c.   | Comm. of sewers                                              | H. Saxon Snell & Son.             | Nov. 15th                | xi.   |
| Tower, Wrought-Iron Tank, &c.        | Southwold Waterworks                                         | Official                          | Nov. 16th                | xii.  |
| Hall, Additions, &c.....             | Northampton Cor.                                             | G. Hodson                         | Nov. 20th                | xii.  |
| al, Eastbourne.....                  | U.R.S.A.                                                     | G. Hodson                         | Nov. 26th                | xii.  |
| on, &c., of Barrack Buildings, &c.   | The Salvation Army                                           | A. M. Mowbray                     | Not stated               | xii.  |
|                                      |                                                              | J. W. Dunford.                    | do.                      | ii.   |

### PUBLIC APPOINTMENTS.

| Nature of Appointment.        | By whom Advertised.   | Salary.          | Applications to be in. | Page. |
|-------------------------------|-----------------------|------------------|------------------------|-------|
| ary Architectural Draughtsman | York Corporation      | 3l. weekly       | Nov. 6th               | xvi.  |
| tor of Nuisances              | Fulham Vestry         | 27 l. 1s. weekly | Nov. 8th               | xvi.  |
| ent Clerk                     | Wandsworth Bd. of Wks | Not stated       | Nov. 12th              | xvi.  |
|                               | Civil Service Com.    | Not stated       | Nov. 21st              | xvi.  |

### TENDERS.

Communications for insertion under this heading must not be later than 12 Noon on Thursdays.

TON. For altering the old oil-cake and flour-mills, street, Boston, into Salvation Army barracks building. (General) Booth. Mr. J. Williams Dunford, architect and surveyor, 101, Queen Victoria-street, London.

head, Leytonstone..... 2678 0 0  
cker & Hinds, Boston..... 628 0 0  
reffield, Boston..... 604 0 0  
der & Legg, Boston..... 571 9 0  
me Bros., Cambridge..... 225 0 0  
erton & Wheeler, Cambridge..... 516 0 0  
afe, Boston..... 440 0 0

OMYARD. For the erection of a small coffee at Bromyard, near Worcester, for Mr. Richard A. Mr. F. W. Dorman, architect, Northampton.—  
John Inwood..... £389 0 0  
Lewis..... 604 0 0  
James..... 575 0 0  
puse Bros. (accepted)..... 495 0 0

OMYARD. For the erection of a mill cottage, at yard, near Worcester, for Mr. E. Phipps. Mr. F. W. Dorman, architect, Northampton.—  
John Inwood..... £410 0 0  
Lewis..... 380 0 0  
Robert Lewis (accepted)..... 335 0 0

TON-ON-TRENT. For the erection and completion of new Army barracks buildings for "General" Booth, accommodation provided for 800 persons, sites in latest seating lighting, and hot-water heating. Mr. Williams Dunford, architect and surveyor, 101, Victoria-street, London, E.C.—  
John Inwood..... £1,250 0 0  
Lewis & Sons, Burton..... 1,200 0 0  
Ellis, Burton..... 1,063 16 0  
Lewis, Burton..... 985 0 0  
Lewis & Sons, Burton..... 898 0 0  
head, Leytonstone (accepted)..... 848 0 0

CTON-ON-SEA. For the erection of a villa residence in Carnarvon-road. Mr. E. C. Horner, architect, Northampton.—  
John Inwood..... £325 0 0  
Lewis (accepted)..... £325 0 0

YDON. For the erection of two villa residences in Carnarvon-road, for Mr. J. Kendall. Mr. E. C. Horner, architect, Northampton.—  
John Inwood..... £2,100 0 0  
Lewis (accepted)..... £2,100 0 0

| OILS.                          | £. s. d. | £. s. d. |
|--------------------------------|----------|----------|
| Lined.....ton                  | 19 10 0  | 19 15 0  |
| Cocconut, Cochin.....ton       | 29 10 0  | 27 10 0  |
| Ceylon.....ton                 | 25 5 0   | 25 10 0  |
| Palm, Lagos.....ton            | 24 0 0   | 24 10 0  |
| Repacked, English pale.....ton | 31 0 0   | 0 0 0    |
| do. brown.....ton              | 29 10 0  | 0 0 0    |
| Cottonseed, refined.....ton    | 22 5 0   | 22 10 0  |
| Tallow and Oleine.....ton      | 19 0 0   | 45 0 0   |
| Lubricating, U.S.....ton       | 5 0 0    | 6 0 0    |
| do. refined.....ton            | 7 0 0    | 12 0 0   |
| TURPENTINE.....ton             | 1 13 6   | 0 0 0    |
| American, in casks.....cwt.    | 1 1 6    | 0 0 0    |
| TAR.....barrel                 | 0 11 0   | 0 11 6   |
| Stockholm.....barrel           | 0 11 0   | 0 11 6   |
| Archangel.....barrel           | 0 11 0   | 0 11 6   |

ENFIELD. For erection of eight cottages for Mr. H. Bostock. Mr. W. Hunter Turner, architect, 68, Finsbury-pavement, E.C.—  
Williams & Wright (accepted)..... £1,840 0 0

GRIMSBY. For the erection and completion of Salvation Army barrack buildings, Grimsby, accommodation for 1,120 persons, seating, lighting, and hot-water heating included. Mr. J. Williams Dunford, architect and surveyor, 101, Queen Victoria-street, London, E.C.—  
Alderton & Wheeler, Cambridge..... £1,380 0 0  
W. H. Smith, Grimsby..... 1,300 0 0  
Hewins & Goodland, Grimsby..... 1,240 0 0  
T. H. Barnett, Grimsby..... 1,182 0 0  
J. White, Grimsby..... 1,172 10 0  
F. J. Colhead, Leytonstone..... 1,159 0 0  
J. T. Young, Grimsby..... 1,130 0 0  
T. Enderly & Co., Grimsby..... 1,112 6 0  
H. Marrows, Grimsby..... 1,003 0 0  
E. Good, Hull..... 993 0 0  
Walker & Cook, Grimsby..... 880 0 0  
F. Grant, Cleethorpes..... 820 0 0

\* Accepted.

HENLEY-ON-THAMES. For new offices and premises, Reading-road, for Messrs. George Dunlop & Son. Mr. George W. Webb, architect, 14, Friar-street, Reading.—  
G. & Lewis, Reading..... £300 10 0  
Bottrill & Son, Reading..... 780 0 0  
G. Searle, Reading..... 747 0 0  
C. Clements, Henley..... 746 0 0  
J. Weyman, Henley..... 731 0 0  
W. Hamilton, Henley..... 685 0 0  
W. H. Simonds, Reading (accepted)..... 630 0 0

LAMBETH. For pulling down and rebuilding the "White Horse" Tavern, Cornhill-road, Lambeth, and improved dwellings adjoining. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within, E.C.—  
Ivory..... £4,545 0 0  
Walker..... 4,500 0 0  
Anley..... 4,472 0 0  
Spencer & Co..... 4,460 0 0  
Davies..... 4,324 0 0  
Beale..... 4,270 0 0  
Downs..... 4,185 0 0  
Balaam Bros..... 4,180 0 0  
Stephenson..... 3,942 0 0

LONDON. For the enlargement of the Newherwood-street School, Kilburn (Marylebone A.B.), by 600 places (exclusive of "provisions"), for the School Board for London. Mr. T. J. Bailey, architect.—  
Wall Bros..... £8,979 0 0  
Hart Bros..... 6,644 0 0  
Sitampson & Co.\*..... 6,500 0 0

\* Recommended by the Works Committee for acceptance.

LONDON. For erecting business premises, &c., High-street and Greenland-place, Camden Town, for Mr. William Cater. Mr. Robert J. Beale, architect.—  
J. W. Dixon, Highgate..... £3,350 0 0  
W. Scrivener & Co., Fitzroy-road, N.W..... 3,110 0 0  
G. Green, St. Pancras..... 3,057 0 0  
Macfarlane Bros., Hornsey-road, N..... 3,085 0 0  
S. R. Lambie, Kentish Town..... 2,927 0 0  
Gould & Brand, Camden Town..... 2,853 0 0  
E. Toms, Camden Town (accepted)..... 2,659 0 0

LONDON. For erecting business premises, &c., High-street and Greenland-place, Camden Town, for Messrs. Miller & Beale, glass merchants. Mr. Robert J. Beale, architect.—  
Gould & Brand, Camden Town\*..... £2,539 0 0

\* Accepted.

LONDON. For erecting sixteen houses and two shops, Alieck-street, Pentonville, for Mr. Alfred Atkinson. Mr. W. Gilbey Scott, architect. Quantities by the architect.—  
Colls & Son..... £13,362 0 0 ..... £202 0 0  
J. Woodward..... 13,162 0 0 ..... 192 0 0  
W. Downs..... 12,445 0 0 ..... 175 0 0  
C. Co. Ltd..... 12,133 0 0 ..... 150 0 0  
F. & F. J. Wood..... 12,127 0 0 ..... 150 0 0  
T. Boyce..... 12,095 0 0 ..... 145 0 0  
Scrivener..... 12,004 0 0 ..... 304 0 0  
Harris & Wardrop..... 11,912 0 0 ..... 135 0 0  
W. Johnson..... 11,859 0 0 ..... 150 0 0  
Faulkner..... 11,796 0 0 ..... 297 0 0  
Godfrey & Son..... 11,732 0 0 ..... 169 0 0  
J. H. Johnson..... 11,443 0 0 ..... 250 0 0  
Hearne & Co..... 11,373 0 0 ..... 190 0 0

\* Accepted.

A. Deduct, if alternate estimate not carried out.

LONDON. For the erection of seven shops and sundry buildings in Bermondsey New-road, for Mr. Armfield. Mr. Edward Crooke, architect. Quantities supplied by Mr. T. J. Fife.—  
Henderson..... £3,895 0 0  
Tyerman..... 3,677 0 0  
W. Downs..... 3,445 0 0  
Holway..... 2,944 0 0  
Tarrant..... 2,513 0 0  
J. & J. Greenwood..... 2,467 0 0  
Spencer & Co..... 2,430 0 0  
Rider & Son..... 2,441 0 0  
H. & F. H. Higgs..... 2,400 0 0  
A. White & Co..... 2,379 0 0  
W. Shepherd..... 2,367 0 0  
W. & F. Croaker..... 2,350 0 0

LONDON. For the erection of seven shops in the fore-courts of Nos. 207 to No. 217, Pentonville-road for Messrs. Howe & Smith. Mr. John Farrer, architect.—  
W. Smith..... £3,197 0 0  
E. Houghton, Stroud-green..... 3,148 0 0  
Wilkinson Bros..... 2,971 0 0  
J. Smith & Sons..... 2,929 0 0  
C. C. Brown..... 2,885 0 0  
Green & Lee..... 2,8 0 0  
Lobb & Oliver..... 2,778 0 0

LONDON. For structural alterations and repairs, Brushfield-street, for Mr. Saul Solomon. Mr. W. Hunter Turner, architect, 68, Finsbury-pavement, E.C.—  
J. A. Reed (accepted)..... £175 0 0

LONDON. For the erection of eight cottages for Mr. H. Bostock. Mr. W. Hunter Turner, architect, 68, Finsbury-pavement, E.C.—  
Williams & Wright (accepted)..... £1,840 0 0

GRIMSBY. For the erection and completion of Salvation Army barrack buildings, Grimsby, accommodation for 1,120 persons, seating, lighting, and hot-water heating included. Mr. J. Williams Dunford, architect and surveyor, 101, Queen Victoria-street, London, E.C.—  
Alderton & Wheeler, Cambridge..... £1,380 0 0  
W. H. Smith, Grimsby..... 1,300 0 0  
Hewins & Goodland, Grimsby..... 1,240 0 0  
T. H. Barnett, Grimsby..... 1,182 0 0  
J. White, Grimsby..... 1,172 10 0  
F. J. Colhead, Leytonstone..... 1,159 0 0  
J. T. Young, Grimsby..... 1,130 0 0  
T. Enderly & Co., Grimsby..... 1,112 6 0  
H. Marrows, Grimsby..... 1,003 0 0  
E. Good, Hull..... 993 0 0  
Walker & Cook, Grimsby..... 880 0 0  
F. Grant, Cleethorpes..... 820 0 0

\* Accepted.

HENLEY-ON-THAMES. For new offices and premises, Reading-road, for Messrs. George Dunlop & Son. Mr. George W. Webb, architect, 14, Friar-street, Reading.—  
G. & Lewis, Reading..... £300 10 0  
Bottrill & Son, Reading..... 780 0 0  
G. Searle, Reading..... 747 0 0  
C. Clements, Henley..... 746 0 0  
J. Weyman, Henley..... 731 0 0  
W. Hamilton, Henley..... 685 0 0  
W. H. Simonds, Reading (accepted)..... 630 0 0

LAMBETH. For pulling down and rebuilding the "White Horse" Tavern, Cornhill-road, Lambeth, and improved dwellings adjoining. Mr. R. A. Lewcock, architect, 88, Bishopsgate-street Within, E.C.—  
Ivory..... £4,545 0 0  
Walker..... 4,500 0 0  
Anley..... 4,472 0 0  
Spencer & Co..... 4,460 0 0  
Davies..... 4,324 0 0  
Beale..... 4,270 0 0  
Downs..... 4,185 0 0  
Balaam Bros..... 4,180 0 0  
Stephenson..... 3,942 0 0

LONDON. For the enlargement of the Newherwood-street School, Kilburn (Marylebone A.B.), by 600 places (exclusive of "provisions"), for the School Board for London. Mr. T. J. Bailey, architect.—  
Wall Bros..... £8,979 0 0  
Hart Bros..... 6,644 0 0  
Sitampson & Co.\*..... 6,500 0 0

\* Recommended by the Works Committee for acceptance.

LONDON.—For proposed additions to Infirmary, Havilland-street, Peckham-road, for the Guardians of the Poor of St. Giles, Camberwell. Mr. Robert P. Whellock, architect, 45, Finsbury-pavement, E.C.—Quotations by Messrs. Franklin & Andrews, 25, Ludgate-hill, E.C.:

|                                       |             |
|---------------------------------------|-------------|
| Barrett & Powell                      | £19,340 0 0 |
| R. & E. Evans                         | 14,210 0 0  |
| G. Parker                             | 17,385 0 0  |
| Banning & Sons                        | 17,269 0 0  |
| Hart Bros.                            | 17,216 0 0  |
| S. Grist                              | 17,110 0 0  |
| E. Lawrence & Sons                    | 17,029 0 0  |
| Martin, Wells, & Co.                  | 17,000 0 0  |
| W. Smith                              | 16,947 0 0  |
| Perry & Co.                           | 16,922 0 0  |
| Higgs & Hill                          | 16,900 0 0  |
| Geo. Gibson, Bouthall, Middlesex      | 16,876 0 0  |
| Wm. Smith, Kensington                 | 16,779 0 0  |
| W. & F. Croucher                      | 16,729 0 0  |
| Balaun Bros.                          | 16,679 0 0  |
| J. J. Greenwood                       | 16,630 0 0  |
| J. Shillitoe & Sons, Bury St. Edmunds | 16,625 0 0  |
| F. Tarrant                            | 16,592 0 0  |
| W. Stubbs                             | 16,564 0 0  |
| Dave Brothers                         | 16,520 0 0  |
| James Longley & Co.                   | 16,452 0 0  |
| Bisset & Sons, Sheffield              | 16,397 0 0  |
| Prestige & Co.                        | 16,360 0 0  |
| Hobbs & Co., Limited                  | 16,339 0 0  |
| Kilby & Gayford                       | 16,327 0 0  |
| F. & H. F. Higgs                      | 16,150 0 0  |
| Mark Gentry                           | 16,170 0 0  |
| A. Bruckel                            | 16,135 0 0  |
| R. P. Hooley, Grantham                | 16,099 0 0  |
| W. Sheppard                           | 16,100 0 0  |
| Holloway Bros.                        | 16,044 0 0  |
| H. & L. Holloway                      | 16,043 0 0  |
| Chas. Wall                            | 16,840 0 0  |
| J. T. Chappell                        | 16,831 0 0  |
| Kirk & Randall                        | 16,820 0 0  |
| John Mowlen & Co.                     | 16,809 0 0  |
| E. Nightingale                        | 16,740 0 0  |
| W. Downs                              | 16,688 0 0  |
| Chas. Ansell                          | 16,660 0 0  |
| Ward, Clark, & Co.                    | 16,612 0 0  |
| Hugh Knott                            | 16,586 0 0  |
| James Holloway                        | 16,539 0 0  |
| J. O. Richardson                      | 16,528 0 0  |
| Brass & Son                           | 16,463 0 0  |
| F. Taylor                             | 16,040 0 0  |
| J. Allen & Sons                       | 16,065 0 0  |

LONDON.—For the erection of warehouse, Green-street, Bethnal Green, for Mr. John Whitbread. Mr. Wm. Hunter Turner architect, 68, Finsbury-pavement, E.C.:

|                             |             |
|-----------------------------|-------------|
| Williams & Wright           | £1,677 10 0 |
| Reed, Walthamstow           | 1,240 0 0   |
| Wise, Bethnal Green         | 1,199 0 0   |
| C. Turner                   | 1,149 0 0   |
| Yardley & Sons, Clerkenwell | 1,100 0 0   |

NORTHAMPTON.—For the erection of four villa residences, for Mr. T. P. Dorman, on the East Park Estate, Northampton. Mr. F. W. Dorman, architect—

|                   |            |
|-------------------|------------|
| Co-ford           | £4,998 0 0 |
| Dunkley           | 4,272 0 0  |
| Martin            | 4,300 0 0  |
| Wingrove          | 3,996 0 0  |
| Green Bros.       | 3,990 0 0  |
| Beardmore         | 3,940 0 0  |
| Heap              | 3,796 0 0  |
| Treson            | 3,795 0 0  |
| Fisher (accepted) | 3,774 0 0  |

NORTHAMPTON.—For the erection of stables, coach-house, &c., for Mr. T. P. Dorman, Cliftonville, Northampton. Mr. F. W. Dorman, architect—

|                        |          |
|------------------------|----------|
| Co-ford                | £493 0 0 |
| Heap                   | 420 0 0  |
| Fisher                 | 497 0 0  |
| Martin                 | 405 0 0  |
| Wingrove               | 398 0 0  |
| Dunkley                | 385 0 0  |
| Green Bros. (accepted) | 384 0 0  |

PUTNEY.—For house, Putney-hill, S.W. Messrs. Lee Bros. & Pains, 8, Adelphi-terrace, architects. Quotations supplied—

|                         |            |
|-------------------------|------------|
| Lukely Bros.            | £2,829 0 0 |
| Adamson & Sons          | 2,653 0 0  |
| S. W. Aries             | 2,630 0 0  |
| Robert Ayles (accepted) | 2,480 0 0  |

READING.—For new bakehouse and premises, Prince of Wales-avenue, Elm Lodge Estate, for Mr. W. Childs. Mr. Geo. W. Webb, architect, 14, Friar-street, Reading—

|                           |          |
|---------------------------|----------|
| Estate Workmen (accepted) | £660 0 0 |
|---------------------------|----------|

READING.—For making upper portion of Cranbury-road, Elm Lodge Estate, including sewage and surface-water drains. Mr. Geo. W. Webb, architect, Reading—

|                               |          |
|-------------------------------|----------|
| W. Reeves, Reading (accepted) | £164 0 0 |
|-------------------------------|----------|

RINGSTEAD (Northants).—For the erection of a public-house at Ringstead, near Northampton, for Messrs. P. Platts & Co., Limited. Mr. F. W. Dorman, architect, Northampton—

|                           |          |
|---------------------------|----------|
| Ch yson                   | £660 0 0 |
| Stone & Co.               | 590 0 0  |
| Marriott                  | 580 0 0  |
| Adams                     | 568 0 0  |
| Freeman & Sons (accepted) | 500 0 0  |

STRATFORD (Essex).—For the taking down and rebuilding sundry works at Messrs. Dane & Co.'s Printing Ink Manufactory, Sugar House-lane—

|                        |          |
|------------------------|----------|
| Lascelles & Co.        | £737 0 0 |
| Bishop & Webb          | 515 0 0  |
| A. Nicholls            | 488 0 0  |
| Green & Co. (accepted) | 435 0 0  |
| Boughtwood & Co.       | 354 0 0  |
|                        | 350 0 0  |

WALTHAMSTOW.—For erection of five cottages, Tower Hamlets. Mr. W. Hunter Turner, architect, 68, Finsbury-pavement, E.C.:

|                              |          |
|------------------------------|----------|
| Williams & Wright (accepted) | £800 0 0 |
|------------------------------|----------|

WORKING.—For alterations and additions to Barracks buildings, for the Salvation Army, Mr. J. Williams Dunford, architect and surveyor, 101, Queen Victoria-street, London, E.C.

|                               |          |
|-------------------------------|----------|
| J. & T. Leatt, Working        | £450 0 0 |
| W. H. Lawe, Working           | 398 0 0  |
| F. Landell, Working           | 360 0 0  |
| F. J. Corhead, Leytonstone    | 348 0 0  |
| G. Baker, Working             | 315 0 0  |
| Alderton & Wheeler, Cambridge | 298 0 0  |
| C. Wright, Broadwater*        | 280 0 0  |

\* Accepted.

### TO CORRESPONDENTS.

S. & M. (should send amounts).—H. I. N. (ditto).—F. K.—O. F. I. C. One who sends a paper (see note).—W. H. (ditto). All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline printing tenders at books and prices. The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors. We cannot undertake to return rejected communications. Letters or communications beyond some reasonable limit which have been deposited for other journals, are NOT DESIRED. All communications relating to literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

### PUBLISHER'S NOTICES.

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CHARGES FOR ADVERTISEMENTS. SITUATIONS VACANT, PARTNERSHIPS, APPOINTMENTS, TRADE, AND GENERAL ADVERTISEMENTS. Six lines (about 800 words) or under ..... 6s. 6d. Each additional line (about ten words) ..... 6s. 6d. Terms for series of Trade Advertisements, also special advertisements on front page, Competitions, Contracts, Sales by Auction, &c., may be obtained on application to the Publisher.

FOUR Lines (about 2500 words) or under ..... 3s. 6d. Each additional line (about ten words) ..... 6s. 6d. PREPAYMENT IS ABSOLUTELY NECESSARY. \* Stamps need not be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, Covent garden, W.C. to DOUGLAS FOUNDRIES, Publisher.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY, and for the Front Page by the same hour on WEDNESDAY.

SPECIAL.—ALTERATIONS IN STANDING ADVERTISEMENTS. REVISES or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY morning.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in regard to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising to "The Builder," may have Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. Free of charge. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

Now ready. READING CASES. By post (carefully packed), 1s.

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"THE BUILDER" is supplied direct from the Office to readers in any part of the United Kingdom at the rate of 18s. per annum in advance. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittance payable to DOUGLAS FOUNDRIES, Publisher, No. 46, Catherine-street, W.C.

SUBSCRIBERS in LONDON and the SUBURBS, preparing at the Publishing Office, 19s. per annum in advance. 4s. 8d. per quarter, can ensure receiving "The Builder" by Friday Morning's post.

### BEST BATH STONE.

CORSHAM DOWN. FARLEIGH DOWN.

BOX GROUND. COMBE DOWN.

WESTWOOD GROUND. STOKES GROUND.

THE BATH STONE FIRMS, Limited.

HEAD OFFICES: BATH.

### DOULTING FREESTONE.

The stone from these quarries is known as the "West Bed," and is of a crystalline nature, and doubtless one of the most durable stones in England. It is of the same crystalline nature as the Cheltenham Stone, but finer in texture, and more suitable for fluted work.

Prices, and every information given, application to CHARLES TRASK & SON, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [Ad.]

### HAM HILL STONE.

Greater facilities have been provided working these quarries, and the stone can supplied in large quantities at short notice.

Prices, and every information given, application to the HAM HILL STONE CO., Norton, Stoke-under-Ham, Somerset.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [Ad.]

Asphalte.—The Seyssel and Metallic L Asphalte Company (Mr. H. Glenn), Office, Poultry, E.C.—The best and cheapest material for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and rooms, granaries, tun-rooms, and terraces. [Ad.]

### Asphalte.

Seyssel, Patent Metallic Lava, and White Asphaltes.

M. STODART & CO., Office: No. 90, Cannon-street, E.C. [Ad.]

SPRAGUE & CO'S

INK-PHOTO PROCESS, 22, Martin's-lane, Cannon-street, E.C. [Ad.]

W. H. Lascelles & Co. 121, Bunhill-row, London.

HIGH-CLASS JOINERY, LASCELLES' CONCRETE, CONSERVATORIES AND GREENHOUSES. Estimates given on Application.

Gardie's Noted Bedfordshire Coarse Fine Silver Sand.—Is perfectly free from impurities and the best and cheapest in the market. All quality stock, for every purpose required in the building trade, filtration, or for nursery purposes. All pure grit! Apply to GEORGE GARDIE, JUNR., F.R.S., Leighton Buzzard. [Ad.]

# HOBBS, HART, & CO., Limited,

PATENT PROTECTOR AND LEVER LOCKS, for all Purposes. STEEL SAFES, STRONG-ROOM & PARTY-WALL DOOR.

SELF-CLOSING DOORS, FOR THEATRES AND PUBLIC BUILDINGS, As approved by the Metropolitan Board of Works (used in large numbers at Covent Garden Theatre).

IMPORTANT COMMUNICATION.—FIRE AT WHITELEY'S.

WILLIAM WHITELEY, Westbourne Grove, London, Oct. 12th, 1887.

GENTLEMEN.—It affords me very much pleasure to express to you my satisfaction and admiration at the splendid fire-resisting power of your Strong-room doors and Safes.

The recent fire at my establishment in my opinion subjected them to the greatest possible test, and through all, they proved invulnerable. The contents of both Strong Rooms and Safes were entirely preserved, although the fire was of such intense destructive force.

You will be pleased to hear that it has been decided to adopt your Patent Clutch-rebated Doors for all the party-walls in the new building now in course of erection.—I am, Gentlemen, faithfully yours,

WILLIAM WHITELEY (Signed) WILLIAM WHITELEY

Offices and Warehouse: 76, CHEAPSIDE, London; Manufacturers, Wharncliffe Works, Arlington-street, London, N.



# The Builder.

Vol. LV. No. 2385.

SATURDAY, NOVEMBER 10, 1894.

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### The Life of Sir William Siemens.\*



LITTLE interest which the general public take in any new invention depends not so much upon the actual ingenuity and far-sightedness of the individual inventor, as upon the practical bearing of the discovery on everyday matters, and the facility with which its effects can be brought home to the average intellect. Nor must the ethical bearings of the discovery be too remote, or their connexion with it will be lost sight of by all but those who are thoroughly understand it. For instance, there has probably been no more brilliant discovery in the present century than that made by the effect upon a magnetic needle of bringing into its neighbourhood an electric current, for from it have resulted all the electrical developments of electro-magnetism which are revolutionising our habits of the present day; yet for one person at the Vienna Exhibition five years ago who was interested in the very needle which Professor Oersted used, there were probably a thousand who examined and endeavoured to make themselves acquainted with the dynamo-machines, the railway locomotive, and the brilliant arc lights, all actuated by that mysterious power which we call electricity. Although Oersted's discovery was the germ which fructified into all these wonderful inventions, it was too remote to be more than the subject of a passing curiosity. Thus it frequently happens that what may be called the secondary inventor, — a man who seizes hold of and adapts to the practical end the brilliant discovery of a scientific student, — reaps far more glory than the man to whom it is really due. Sir William Siemens was one of the few men who combined in himself both the acute theorist whose active brain could devise new combinations of scientific principles, and the patient, painstaking adapter whose mechanical skill and accurate knowledge enabled him to embody his abstract ideas in practically useful inventions. The life of such a man must

be of more than usual interest to the world, and in the work under notice Dr. Pole has given us not only an account of the scientific inventor, but, although inventions form the subject of the bulk of the book, a vivid picture of the man himself.

Carl Wilhelm Siemens, who was one of a family of fourteen children, was born on April 4, 1823, at Lenthe, a small place near Hanover, where his father occupied the position of a well-to-do farmer. An interesting account is given of his family, three of whom were in intimate business relations with the subject of this memoir all his life. In fact, his eldest brother, Werner Siemens, who was originally in the army, and who now enjoys a world-wide reputation as an electrician and man of science, was more like a father to him and his brothers; and the high position attained by the firm of Siemens Bros. in England, and Siemens & Halske in Germany, is largely due to the enterprise, skill, and judgment of this gentleman. This judgment was never more strikingly displayed than when he opposed the design which his parents had formed of sending William to a merchant's office, and induced them to allow him to prepare himself for mechanical and scientific pursuits. Accordingly, in 1838, William was sent to a Gewerbe-Schule in Magdeburg, where Werner was in garrison. In 1841 he removed to the University of Göttingen, where he stayed about a year, and during this time he must have had nearly all the theoretical scientific teaching that he ever obtained, for at Magdeburg the scientific appliances were absurdly few. In 1842 he obtained a place as pupil in Count Stollberg's machine-factory in Magdeburg, where his mechanical genius soon asserted itself, for in the first six months he sent his brother a description of a new kind of valve-gearing which he had invented for steam-engines. About this time Werner Siemens had patented a process of electro-plating, and he conceived the idea of sending his brother William abroad for the purpose of pushing the invention. Accordingly, in the early part of 1843, after spending a month in Hamburg, where, by the application of his new process, he was enabled to realise sufficient money to take him to England, he arrived in London. No words could better describe the spirit of the young German mechanic than those which he himself used nearly forty years afterwards when addressing an audience in Birmingham, and alluding to this, his first start in life. He said:—"A spirit of enterprise came over me

so strong that I tore myself away from the narrow circumstances around me, and landed at the East-end of London with only a few pounds in my pocket, and without friends; but an ardent confidence of ultimate success within my breast." He obtained an introduction to Messrs. Elkington, of Birmingham, who were much struck with his versatility and ingenuity. After further consultation with his brother Werner, he was able to convince Messrs. Elkington of the practical merits of the new processes, and they most liberally paid him nearly 1,500*l.* for his invention. In after-years he used jokingly to allude to the fact that before he had completed the negotiations with the Elkingtons his ready-money was reduced to half-a-crown. It must be a source of legitimate pride to the members of this firm to think that by their liberality they were the undoubted cause of the settlement in England of the man who became the foremost mechanical inventor of the century, and whose name will always be held in the highest honour in his adopted country.

It is not surprising that this quite unexpected success somewhat turned the heads of the whole family; they evidently looked upon England as an El Dorado for inventors, and in the following year we find William again in this country with two new patents,—one for a contrivance for regulating the rate of motion of steam-engines, called the "Chronometric Governor"; and another for a new method of obtaining facsimiles of drawings, letterpress, &c., called "Anastatic Printing." The modest value of 86,000*l.* was placed upon these inventions by Mr. Siemens, but he soon found out—as Werner told him—that "parental love is a beautiful thing, but it makes the sharpest eyes blind to the defects of the progeny," and after two years' attempt to work the "Anastatic Printing," with increasing worry and anxiety and the loss of all his capital, he finally was only too glad to get rid of the whole business. The Chronometric Governor never turned out a practical success for steam-engines, but it has been applied in a somewhat modified form at the Royal Observatory, Greenwich, to the Chronograph clock and to the water-clock for driving the large equatorial, and in both cases it is still in successful operation.

It was in 1849 that Mr. Siemens first brought his genius to bear upon a subject that afterwards constituted the main work of his life, viz., the economising of heat in the processes of manufacture. He first turned his attention to the steam-engine, devoting several

\*The Life of Sir William Siemens, F.R.S., D.C.L., D.S., By William Pole, F.R.S., Hon. Sec. of the Institution of Civil Engineers. (London: John Murray, 1893.)



years of labour and great ingenuity to what was called the regenerative steam-engine, the principle of which, shortly stated, was that the steam, after doing its work, deposited a certain portion of its heat in a kind of respirator, where it could again be taken up, instead of passing away and becoming lost. In connexion with this invention, Mr. Siemens read his first paper before a scientific body—the Society of Arts; the idea was generally approved, and he was awarded the Gold Medal. In spite, however, of all its merits, it never became a practical success, and its failure was a source of keen disappointment to Mr. Siemens; but there can be little doubt that his work and experiments with this engine were of the greatest use to him, as they gave him such an intimate knowledge of all heat processes that he was afterwards able, by means of his regenerative furnace, to completely revolutionise many industrial pursuits, and to obtain temperatures previously undreamt of.

The regenerative furnace was a much simpler idea than the regenerative steam-engine, and the original merit of it was due to Frederick Siemens, in whose name the patent was taken out on December 2, 1856. Instead of allowing the products of combustion to pass away directly into the air, they were led through chambers lined with fire-bricks, which absorbed a large percentage of the heat; and, when these chambers became quite hot, the atmospheric air to feed the furnace was passed through them, while the products of combustion were directed into another regenerative chamber, which, in its turn, served as the passage for the air, and so on alternately. The saving of fuel resulting from such an apparatus was enormous, but, in addition to this, vastly-increased temperatures were produced, so great, in fact, that in many cases the furnaces were entirely consumed. During their experiments with these furnaces the brothers Siemens hit upon a very important modification, viz., the conversion of ordinary solid fuel into gaseous fuel, which latter was alone used in the furnace itself. The impurities of the ordinary fuel were thus eliminated, and the results had a most important bearing upon all industrial processes where great heat is required, foremost among them being glass-making. The success of the new furnaces at Messrs. Chance's works near Birmingham attracted the notice of Professor Faraday, who described them at the last Friday evening lecture which he ever delivered at the Royal Institution, Albemarle-street, on June 20, 1862, and after this Mr. Siemens's high position in the scientific world was assured. One of the most successful adaptations of the Siemens regenerative principle was the Hoffman patent kiln, which is now extensively used for brickmaking, in which the heated gases produced by combustion are applied in drying the fresh bricks about to be burnt, and the heat of the bricks which are cooling after being burnt is used in warming the air which goes to feed the fires, thus producing a double economy. Some time before the regenerative furnace had been elaborated, Mr. Siemens had designed a water-meter, which at once became a success, and brought him in a considerable income from royalties, and from this time (1853) he was rid of the pecuniary troubles which had hampered him for the previous ten years. In 1859 Mr. Siemens became a naturalised Englishman, and in the summer of that year he married, his wife being the youngest daughter of Mr. Joseph Gordon, W.S., of Edinburgh.

It soon became apparent that the regenerative furnace was capable of quite unforeseen developments, and Mr. Siemens began experimenting upon the production of steel; and the account which Dr. Pole gives us of the difficulties which were encountered, and of the patient ingenuity with which these difficulties were met and conquered, forms one of the most interesting chapters in the book. The plan adopted by Mr. Siemens to bring his discoveries and processes into practical use was characteristic of the business qualities of the man. He appreciated the fact that the railways would be the great users of steel

rails, if these could be produced at a moderate cost; and, as the essence of his invention was the production of steel by the mixture in a fused state of ordinary pig-iron and malleable or "scrap" iron, he conceived the idea of converting old worn-out iron rails into new steel ones, and he made a proposition to the North-Western Railway Company to do this. After some deliberation his proposals were accepted, the experiment was perfectly successful, and the conversion of old rails to new ones is still carried out in this way. As a result of the large orders for steel rails which now poured in upon him, Mr. Siemens determined to form a company for the establishment of steel-works. This resulted in the formation of the world-renowned Landore Siemens Steel Company, the produce of whose works could always be depended upon for the highest quality; but of late years, from various causes, heavy losses ensued, and the premature death of the founder, coming as it did in the midst of the serious depression in the iron trade, must have been a crushing blow to the company.

Twenty years after the invention of the regenerative furnace, Mr. Siemens, who, in 1870 had had the degree of LL.D. conferred upon him by the University of Oxford, was still hard at work on various applications of it; and now he endeavoured to revolutionise, not extensive industrial processes, but ordinary household appliances, more particularly with the view of obviating the terrible discomfort, disease, and death occasioned by the smoky atmosphere of large cities, by diminishing the amount of smoke given off by ordinary coal-fires. The introduction of the Siemens gas-stove—or, rather, its adaptation to ordinary fireplaces—is of so recent occurrence that it must be fresh in the mind of every one who takes an interest in these matters; but it may be remarked—as Dr. Pole very justly observes—that, simple as this stove is, it is based upon the strictest scientific principles. The gas and atmospheric air combined are brought into contact after ignition with ordinary coke, which is thus supplied with the elements abstracted from it during the manufacture of gas, but in a more economical form. We have often regretted that so little practical use has been made of this invention, and, although it has been on several occasions alluded to in this journal, it may not be out of place to recapitulate the advantages which Dr. Siemens claimed for his fire. These are:—"1. Absence of smoke. 2. Greater heating power at less cost. 3. Facility of lighting without the usual laying of paper or wood. 4. Keeping alight without attention or stirring. 5. Ease of regulation or adjustment, according to the heating effect required. 6. Capability of being lighted or allowed to go out at any moment, which is not only a great convenience, but means considerable economy." Since 1880 the smoke nuisance has not in the least diminished, and we can only hope that Dr. Pole's reference to the subject, and to the great interest which Sir W. Siemens took in it, may revive attention to an invention which, if more extensively used, would prove of inestimable benefit to all dwellers in cities. As an instance of Sir W. Siemens' intimate knowledge of the minute details of everything connected with his inventions, we may mention that not long before his death he took considerable personal interest in fitting-up several of his gas-fires in the house of a friend, and that one of them would not work satisfactorily. After many attempts to remedy the defect, Sir William suddenly said, "I am convinced there is some slight irregularity in the interior of one of the burners." The whole thing was taken to pieces, and it was found that a workman had by mistake just commenced drilling the inside of one of the burners, and, in consequence, the gas in passing through it was slightly diverted from its proper course. The delight with which Sir William exclaimed, "I told you so," will be long remembered by those who were with him. The regenerative principles involved in the Siemens furnace were afterwards successfully applied to gas-lighting in the Siemens regenerative gas-burner, which utilised the

heat given off by the gas-flame to warm the incoming gas before it arrived at the point where it was ignited, and considerable increase of lighting-power and economy was the result.

We have devoted so much space to a account of Sir W. Siemens's work in relation to heat and its applications because we have always felt that herein the innate inventive genius of the man mainly asserted itself. A considerable portion of Dr. Pole's work taken up with an account of the improvements and discoveries in the electrical world, of which the subject of the memoir had so large a share, but while fully admitting the immense amount of ingenuity and talent which William Siemens brought to bear upon this subject, we cannot help feeling that to the elder brother, Werner Siemens, was due the origination of many of the most successful applications of electricity. It was Werner who in 1833 foresaw the immense field which electric science would open to industrial arts and manufactures; it was he who, in conjunction with Mr. Halske, in 1847 established the first factory for telegraphic construction, with reference to which he wrote thus:—"I am resolved to establish for myself a fixed career for telegraphy. This will become a special and important branch of scientific engineering, and I feel that I have a call to take up telegraph organisation, as it is, I am convinced, yet in its infancy." It was Werner who, in 1848, proved the practicability of submerging, in Kiel harbour, copper wire coated with gutta-percha, without detrimentally affecting its conductivity, and this led to the firm carrying out the laying of several submarine cables during the years 1858 and 1859. Again, we find that in 1856 Werner Siemens, working on the lines suggested by Faraday's great discovery of the possibility of obtaining electric currents from ordinary magnetism, had constructed an armature of novel shape, and winding insulated wires round it, and thus causing it to revolve between the poles of permanent magnets, he obtained very powerful alternating currents, which, by means of a commutator, were easily rendered continuous. Ten years afterwards came the inestimably important discovery, that for producing electric currents, permanent magnets could be dispensed with, and that the residual magnetism always remaining in the iron core of an electro-magnet was sufficient of itself to induce feeble currents in the coils of revolving armature, which currents intensified the original magnetism of the inducing coil, and thus in a very short time, by mutual action and reaction, effects of great magnitude could be produced. This discovery was communicated to the Royal Society by William Siemens on February 14, 1867, a day ever memorable in the annals of science, from the fact that Professor Wheatstone and Mr. Varley simultaneously announced that their same discovery had been made by themselves independently. Once more, we are told that in 1878 Werner Siemens worked out a design for an electric railway, and constructed it on a small scale, and thus initiated the electrical transmission of energy. There is not the slightest doubt that William Siemens was of the greatest possible assistance in improving, elaborating, and developing the idea, which his brother's active brain had first suggested, and the story of his share in carrying out the numerous undertakings which the firm had on hand forms one of the most interesting portions of the book. We find him negotiating with the various Governments interested in the construction of the Inter-European Telegraph, superintending the arrangements for the laying of the first Atlantic cable, devising improvements in the early dynamo machines, and arranging for their adaptation to purposes of lighthouse illumination, designing lamps, and taking the lighting by electricity of the Royal Albert Hall, and displaying versatile energy in a thousand different ways. The cable steamship *Faraday* was constructed from Dr. Pole's own special designs, and Dr. Pole justly observes "that the design of such a vessel, capable of doing what no other vessel afloat could do, by a landsman born in the interior of Europe, whose education and pursuits had little or no connexion with



nautical affairs, was a striking example of practical genius of the highest character." Shortly before his death Siemens set himself to devise means of making practical use of the great heat of the voltaic arc, and took out a patent for an electric furnace, the heat of which would far transcend his own regenerative furnace. Since 1883 more powerful machines have been constructed than were known previously, and one of the most important developments of the electric furnace has been in the production of pure aluminium and its alloys. This metal exists in the state of ore of so stubborn and refractory a nature that no furnace was capable of reducing it, but Messrs. Cowles, of Stoke-on-Trent, are now able, by the aid of a Crompton dynamo of 500-h.p., giving a current of from 6,000 to 6,000 amperes, to obtain either the pure metal or its alloys after about one hour-and-a-half's firing, at a far less cost than was ever previously possible.

We have not space to allude to the many miscellaneous inventions of Sir W. Siemens, such as the electric pyrometer, the deep-sea photometer, the bathometer, an instrument for showing the depth of the sea without sounding—the description of which is almost startling in the boldness of its conception; the instruments for measuring electric currents, one of which is of such extreme delicacy that it can detect the infinitesimal currents passing in a telephone wire; nor can we do more than allude to his daring speculations upon the cause of the permanence of the sun's temperature. Sir William Siemens was in the highest sense a scientific man, but it was the practical side of science to which he attached most importance. He appreciated to the full the immense advantage it is to a nation to foster a scientific education for all classes of society, and in the latter years of his life he was always ready to give his aid towards improving technical education in his adopted country, while his generosity to poor and struggling inventors will never be fully known except to the recipients of it. His success in life was doubtless due in no small degree to his innate genius, but this would have been unavailing without the energy and determination which accompanied it. This record of his life and work should be read by every student, and should be in the library of every Mechanics' Institute in the country. Not only were all the distinctions showered upon him richly deserved, but every society and institution to which he belonged was honoured by enrolling him among its members. No more fitting epitaph for such a man could be found than the words uttered by his brother Werner after the funeral,—"Ein so volles Leben! ein so schöner Tod! und eine solche Anerkennung."

#### BATTERSEA FREE LIBRARY COMPETITION.

**T**HE parish of Battersea is one of the largest of the metropolitan parishes, and extends, roughly speaking, from near Millbank to Tooting. It comprises about 2,200 acres, and has a population of some 170,000 souls, which is rapidly increasing. The present Free Library, which has only been a few weeks in existence, is accommodated temporarily in one extremity of the parish, and is quite out of the reach of a large proportion of the parishioners who help to support it by contributing to the rates. The Committee have, after the customary delays and difficulties, succeeded in acquiring an ample site in almost the centre of the district which the Library is to serve, and they have lost no time in setting about obtaining designs for the erection of a suitable building. Ten architects were invited to prepare designs, and all of them responded to the invitation, and, as the result shows, expended not only time and money upon the work, but an immense amount of thoughtful consideration. Their names are Mr. E. W. Mountford, Messrs. Chatefield Clarke & Son, Mr. Rowland Plumbe, Mr. C. Jones, Mr. Francis Hooper, Mr. H. T. Bonner, Mr. Henry

Branch, Mr. I. W. Hanson, Mr. Walter Lyon, and Mr. Sydney Smith.

Premiums of 30*l.*, 25*l.*, 15*l.*, and 10*l.* were offered for the best designs in the order of merit, and they have been awarded to Mr. Mountford, Messrs. Chatefield Clarke & Sons, Mr. Rowland Plumbe, and (the late) Mr. C. Jones, respectively.

The Committee wisely availed themselves of a clause in the "Instructions," and called in the assistance of Messrs. Hunt & Steward to assist them in making the awards. The recommendations of that firm have, we understand, been followed, and we are of opinion that the result is satisfactory.

The instructions to the competing architects were unusually full and minute, prescribing not only the required rooms, but—within a margin of ten per cent.—their areas, capacity, &c.

The sum to be expended was limited to £6,000, and herein, as usual, lay the real difficulty. We are given to understand that Messrs. Hunt & Steward's report pointed to only one design as fulfilling this condition. It is fortunate that it is one of the three designs almost identical in plan which give, on the whole, the best disposition of the several portions of the building. It is a well arranged and good working plan—the news-room on the right of the entrance, the magazine-room on the left, the lending library extending almost across the rear frontage, the librarian's office being placed between it and the news-room. The one doubtful point in the arrangement is, perhaps, the lighting of the latter room, which has an end light only; and, of course, the same remark applies to the ladies' reading-room over it. But with certain borrowed lights this may prove sufficient.

The elevations are broadly treated but dignified, and quite void of useless detail. What there is is well-designed and well-proportioned, and the general effect is pleasing.

This design has been put to the test of open tenders, and one has been received from a substantial firm for a sum within the prescribed limit.

The design placed second has an admirable plan, the lighting throughout being very good. It is sent in, curiously enough, under the same motto as the successful one, but proved, we imagine, upon analysis, too expensive for the funds at disposal.

The design placed third in order of merit is very similar to the chosen design in plan, but the lighting is inferior, the reference library suffering severely in this respect. It is treated in the prevailing Queen Anne manner, and has many good points.

The remaining premiated plan has a general similarity to the foregoing, but the elevations have less architectural merit.

The other designs do not call for detailed remarks. The plan submitted by Mr. Bonner is by no means equal to the selected plans, but the grouping of his buildings is effective, though obviously too elaborate and expensive for the object in view. They are shown in a boldly drawn and nicely tinted perspective.

Mr. Branch has devised what is in some respects an excellent plan, but the lighting of the lending library went far, we fear, to condemn it.

The most original plan is that by Mr. Hanson. The distinguishing feature is the large oval top-lighted reference library on the first floor, with book-stores ranged in the spandril spaces outside. If a reference library were the central requirement, which is not the case, this plan should have commended itself strongly to the assessors. It fills the whole area available, and is marked by great ingenuity of treatment, and is well arranged and lighted throughout.

The most artistic elevations we take to be those of Mr. Walter Lyon. They are in a refined variety of Renaissance, treated with much grace, freedom, and power; but they are handicapped by a plan which gives a library of 80 ft. in length lighted only at the ends.

Mr. Sydney Smith has removed his drawings.

We think the Committee are to be congratulated on the success of their enterprise so far; their invitation has been cordially responded to by the selected architects, who have submitted thoughtful designs unusually well represented. The chosen design will provide the required accommodation in a building of quiet and appropriate exterior, and in adopting it substantial justice to all has, we think, been done by those entrusted with the delicate and difficult task of making a selection from so many excellent plans.

#### NOTES.

**W**E are very glad to observe from last Tuesday's *Times* that the leading journal has at length come to the perception that the opening meeting of the professional representative body of architects, and an address on architecture from a leading member of the profession occupying the presidential chair, are matters worth some better kind of notice than a condensed paragraph in an out-of-the-way corner of the paper. The discovery has come rather late in the day; but it is never too late to mend, and we hope this is a sign that the *Times* is about to show a somewhat more intelligent interest in the subject of architecture for the future. It must be admitted that Mr. Waterhouse's presidential address furnished every excuse for special attention on the part of outsiders as well as the profession. There can have been few better addresses of the kind delivered from the chair in the Conduit-street rooms; an address remarkable for its common sense and practical character, as well for its enthusiasm, and for the broad view of the subject of architecture in regard to past and future which it included. We are glad to see that the President took the opportunity of dwelling on the importance and value of the compulsory examination for Associateship of the Institute, and pointed out to the profession and the public the practical guarantee of proficiency which in future the fact of membership of the Institute of Architects would give to those who had attained it through the examination test to be now made the condition of membership. We were very much in want of a clear and decisive declaration of policy on this head from the President of the Institute, and nothing certainly could be more clear or precise than Mr. Waterhouse's opinion on the subject. This kind of examination, of course, is quite a different thing in principle from that kind of competitive examination, against which, or against the abuse of which, there is a strong reaction in public opinion setting in. What is proposed is not examination as a test of relative ability as between one person and another—a test so often illusory, and bringing in its train all the evils of the "crum" system; it is an examination to test proficiency in professional knowledge up to a certain standard. Genius, of course, cannot be tested by examination; what can be secured by this means is that genius should have a solid platform of knowledge to start from. Nor can moral character be tested by examination; but the Institute has shown its determination to deal strictly with lapses from professional *morale* by striking off from its list of members one of the architect Members of the Board of Works whose method of feathering his own nest was among the exposures of the recent Royal Commission.

**T**HE current number of the *Nineteenth Century* contains a characteristic exposition by Mr. Shaw-Lefevre of the entire excellence and success of all the schemes of architectural improvement in London of which he claims to be the official author and origin. The way in which he has ordered things, in moving the Constitution-Hill arch, building sham antiques at the Tower, and tacking a so-called restoration on to Westminster Hall, is the one possible and excellent way, and there is no other. We have had all this over before, in nearly the same words, in the same magazine, so that there is nothing to be surprised at in Mr. Shaw-Lefevre's admiration of him-



self as a public edile. What one is inclined to wonder at is why Mr. Shaw-Lefevre's advertisement of himself should be considered a matter of so great public interest that he should be allowed twice to repeat it in the same magazine; and how it comes to pass that the Editor of the *Nineteenth Century*, who is himself an architect, should allow a self-complacent dilettante, whose knowledge of the subject is obviously of the most superficial kind, to act the part of architectural lecturer, and to pose as his own critic. In the face of such an ignorant architectural public as ours, this kind of thing does a great deal of mischief. That wise print, the *Pall Mall Gazette*, has already suggested that Mr. Shaw-Lefevre should be appointed "permanent edile" for London, apparently taking Mr. Shaw-Lefevre's architectural perceptions at his own valuation.

WE gave a long quotation last week from an article in the *Quarterly Review* on the subject of Technical Education, advocating the view that the workshop was the real School of Technical Education. The current number of the *Nineteenth Century* contains an article by Lord Armstrong, "The Cry for Useless Knowledge," on just the same line of argument. Lord Armstrong has, at all events, had experience enough of what workmen can and cannot do. At the Elswick works, he says, schools and a mechanics' institute have been built, and evening science and art classes established, which have been largely attended. But he distinctly denies that the way of turning out work in his foundries by the average hands has been in any way affected by these advantages afforded for education out of the workshop. Where he thinks the effect is to be found is that the class of men who, from their superior ability and thoughtfulness, would naturally rise to the position of foremen and directors of labour, are assisted in acquiring a fitness for such positions by knowledge which they acquire in the Elswick Schools; but he entirely denies that it has affected the quality of the workmanship generally as turned out in the foundries. Lord Armstrong puts the question, where the line is to be drawn in giving scientific education at the national expense. He says there are in London about 4,000 different industries, which all might claim to have a scientific basis. If all these are to have the foundation of special technical education, the task is impossible; if there is to be a selection, it is unfair. Lord Armstrong here, however, seems to do an injustice to the advocates of technical education, or to most of them. They are not proposing to teach trades, but to give the education in technical matters which would be supposed to better fit the man to learn his trade. Even on this view, however, there can be no doubt that a technical education intended to have a bearing on all trades would have to be on a very extensive scale indeed. The increase and improvement of technical schools, of course, would be of great value to a number of persons. The question is, would it materially affect the average workman, or would it not even throw him backward in learning his trade, by keeping him longer away from the practical training in the workshop, the only school in which he can really acquire dexterity and familiarity with his tasks? And there is the further question, would it really give us any assistance as against foreign competition? These are questions deserving serious consideration on the part of those who are, it is to be feared, too sanguine in their expectations as to the practical influence of technical schools.

THE last volume of the "Transactions" of the Institute of Architects, which is just out, derives a special interest from its including Mr. Penrose's exceptionally-valuable paper on his investigations on the site of the temple of Jupiter Olympius at Athens, and his plans of the ascertained position of the walls and colonnades. The paper by Mr. Gerald Horsley (Owen Jones Student), on "Notes of a Tour in North Italy," is also of special interest, as illustrating, both with pen

and pencil, some things that are more or less out of the beaten track of architectural sketching in Italy. A sketch of a palace on the Corso Garibaldi at Cremona shows a treatment exceedingly unusual in Renaissance architecture, an elevation with two orders of pilasters, and crowned, not by a Classic cornice of the ordinary type, but by a large cove with a tenia below and a comparatively small crown moulding above, the cove decorated in colour. Such a cornice would form a good position for the introduction of external mosaic decoration, supported and led up to by coloured marbles or terra-cotta below. A charming sketch is also given of a marble wall-tomb in San Fermo Maggiore, Verona: a highly-enriched coffer, or sarcophagus, carried on large cantilever brackets, projecting from the wall-face.

THE Railway Commissioners delivered judgment last week in a case brought against the Rhymney Railway Company, the snug little Welsh line of fifty miles, which always pays 10 per cent. dividend. It appears that a large quantity of coal is sent into Cardiff by this line from Dowlais and from Rhymney, and that there is a difference in the respective rates in favour of the former colliery of about 2d. per ton, which, the Commissioners were asked to say, constituted an undue preference. Of course, the preference was not denied, but some ingenious arguments were put forward to show that it was not undue. It was urged that Dowlais undertook to send a larger amount of traffic,—their total for six months being 177,000 tons, against 56,000 tons from Rhymney; that the company were willing to give the same terms to every one who gave the same large amount of traffic, and were therefore entitled to give the reduced rate complained of without being laid under the charge of undue preference. Another point was that the proportion of working expenses of the Rhymney Railway Company to the receipts had decreased to a marked extent since they had the carriage of the traffic on the Dowlais line (to which the Dowlais collieries had been very large and useful contributors), and that the company were therefore entitled to give some preference to those collieries. The Chief Commissioner (Sir Fredk. Peel) decided that a reduction in working expenses over a railway system consequent upon an enlargement of the operations of the company did not entitle them to single out a particular customer for benefit. It would certainly have appeared more reasonable had they taken the opportunity of reducing rates all round, than to have practically given a new customer a bounty, to the prejudice of old ones in the same line of business. The fact appears to be that the railway company entered into an agreement with the Dowlais Company to grant them this lower rate conditionally upon their sending a certain proportion of their traffic upon this line, relying upon the arguments alluded to, and other points, to protect them from a charge of undue preference. Possibly, if it could have been shown that in the larger business a smaller profit per ton was as valuable to the company as a larger profit per ton in a less business, the Commissioners might have looked upon the difference in treatment as being reasonable; and it must be remembered that the new Act, setting forth various considerations which may be had regard to in deciding cases of this nature, does not come into operation until next year, and does not affect cases now before the Commission. Under the existing law, and upon the evidence given, the Commissioners decided that the difference in treatment was not justified and could not be sanctioned.

HOW hard it is for public bodies to overcome difficulties in regard to sanitary matters in many places is well exemplified by the recent decision of the Queen's Bench Division, in the case of Regina v. The Staines Local Board. It appears that the owners of certain houses at or near Staines have a prescriptive right to drain them into a sewer which runs into the Thames. The conse-

quence, of course, is that the river is thus polluted to a larger or smaller extent. The Conservators, under their statutory powers, as was their duty, tried to prevent this nuisance by a long course of proceedings against the Staines Local Board. This Board, however, pleaded that they could not prevent this state of things, in consequence of the before-mentioned rights, as no sewage from any drains under their control passed into this particular sewer. There is no reason to suppose that the Local Board would not, if they had had the legal power to do so (which it was clear they had not), have prevented this sewage from running into the Thames. The case, therefore, clearly shows, —as, indeed, previous ones have already done,—how necessary it is, in the interests of the community, that these prescriptive rights should not be allowed to obstruct the course of sanitary reform. There are plenty of places on the Thames and other rivers where similar prescriptive rights exist. It is obvious that the right of draining into a river or water-course is not in itself a valuable privilege, so long as the house in question can be otherwise efficiently drained. It is clear, therefore, that Urban Sanitary Authorities should have the legal power to take away prescriptive rights, provided that in place of them they give efficient drainage accommodation to the houses to which the right is attached. The matter is not very difficult, and it should be possible to reconcile public and private interests, which ought not really to be in conflict.

FROM the Registrar-General's "Quarterly Return" No. 159, just issued, we learn that during the three months ending September 30 last 270,720 births, and 139,821 deaths were registered in the United Kingdom. The natural increase of population during the quarter was therefore 130,899. Taking the population of the United Kingdom in the middle of 1888 at its estimated number of 37,440,505 persons,\* the birth-rate for the quarter was 28.7, and the death-rate 14.8 per thousand. For England and Wales, during the same period, the death-rate was equivalent to an annual death-rate of 15 per thousand of the estimated population. This death-rate, the Registrar-General informs us, was 3 per thousand below the mean rate in the corresponding periods of the ten years 1878-87, "and was considerably lower than that recorded in the third quarter of any year since the commencement of civil registration in 1837." This is the more noteworthy when taken in conjunction with the statement that "the mean temperature of the air during the quarter was 57.6 deg., and was 2.1 deg. below the average for the corresponding quarters of 117 years. The mean was below the average in each month of the quarter, the largest deficiency occurring in July." These figures are given by the Registrar-General on the authority of Mr. James Glaisher, F.R.S. "The weather in July," it is pointed out "was remarkably cold and wet, and the deficiency of sunshine was also remarkable; the rain-fall of the month was, with one exception (1828), higher than in any corresponding month so far back as 1815." In the twenty-eight great towns of England and Wales (including London) the death-rate was 16.9 per thousand, which exceeded the urban rate by 1.2, but was 3.6 below the mean rate in these towns in the corresponding quarters of the six years 1882-87. The death-rate was only 16.2 in London, while it averaged 17.5 in the twenty-seven other great towns. The lowest rates in the provincial towns were 12.7 in Bristol, 13.7 in Nottingham, 13.9 in Brighton, and 14.3 in Hull; while the highest were 20.2 in Bolton, 20.3 in Leeds, 22.4 in Preston, and 23.5 in Manchester. A summary of the weekly returns with which the Registrar-General is favoured by various local authorities abroad shows that the annual death-rate during the quarter ending with September last in thirty colonial and foreign

\* This total being made up thus:—England and Wales, 28,028,804; Scotland, 4,031,188; and Ireland, 5,777,545.



ties, having an aggregate population exceeding sixteen millions of persons, was 25·3 per thousand. In the twenty-one European cities included in the above, the mean rate was 22·7, against 16·9 in the twenty-eight large English towns. The death-rate of Paris during the period covered by the report was 19·7, that of Berlin 22·3, that of Vienna 22·1, that of New York 28·9, and that of St. Petersburg, 30·4, so that London, with its exceptionally low rate of 16·2, more than maintains its distinction of being the healthiest capital in the world.

WE have received Dr. Airy's Report to the Local Government Board on an epidemic of diphtheria at Walthamstow. In this case, though some parts of the district appear to be efficiently drained, the report leads to the conclusion that there was some special cause for the introduction of the disease from outside, and that personal communication was the chief means of spreading it within the district. Dr. Airy refers to the existence of bell-pumped yard gullies in connexion with one of the houses, all built by the same builder, but it was not found that disease had specially attacked these houses. Dr. Airy recommends, however, that the Sanitary Authority should examine and repair or relay any portions of the sewerage of the district which they have reason to suspect to be unsound, and provide for the more efficient flushing of the sewers; and more especially that they should make suitable provision, either by erecting a hospital of their own or by combination with some neighbouring Sanitary Authority, for the treatment of persons suffering under infectious disease.

A CASE of considerable interest to German architects has just been decided at Berlin, after a delay of more than a year. A large hospital, consisting of separate and distinct blocks, is being erected in this city, Mr. Hiller being the architect, and a Mr. Siber the contractor. One of these blocks had been built up to the cornice, which was to be in terra-cotta, when, on August 22 of last year, some 60 ft. of this cornice suddenly gave way, bringing nine workmen to the ground, of whom eight were killed. The cornice had a backing of 14 in., and the two upper courses of mouldings, projecting 15 in. beyond the face of the wall, rested on a continuous iron plate, which was tailed down into the backing by means of iron rods 3 ft. long at intervals of 6 ft. This construction seems to have been approved by experts at the trial, but it is contended that, when the terra-cotta was it being delivered as fast as wanted, the works should have been stopped. Instead of this, the fixing of such blocks as had been delivered was proceeded with, the result being improper work and the collapse of the cornice. For their fate had been hanging over them for more than a year, both architect and builder were condemned to six months' imprisonment. Apart from any question of the immediate cause of failure, the method of construction described appears to us open to the strongest objection, being rather to be called bandaging than building.

ATTENTION has been called recently to the at present vacant site of Poplar-ace, north-westwards of the Foundling Hospital. The condemned houses here were recently pulled down, and the hospital governors have let the land, being about 67 ft. square, for the building of a block of artisans' dwellings. Inasmuch as the site is already surrounded by a double row of houses standing *dos-a-dos*, and can be approached by only a narrow wide, but covered passages, (through those houses) that lead out of Compton and Judd streets, Mrs. Holmes justly represents that if the space is allowed to be covered with a high block of artisans' dwellings it cannot but become a breeding-place for all that is unwholesome, unsavoury, and pestilential, devoid of sufficient light or air." She urges that the area should rather be converted to a free playground for the many poor children of that already over-

crowded locality, whose liberty in sport is somewhat, albeit necessarily, curtailed in the new St. George's-garden, as lately opened to the public. It appears that the St. Pancras Vestry acquired, and for about 1,000*l.*—in terms of the Artisans' and Labourers' Dwellings Acts, 1868 and 1879,—the residue, being twenty years of the term for which Poplar-place was held from the Hospital. In 1886, they surrendered the lease to the governors in exchange for relief from the covenants and rent thereunder. In the *Times* of the 1st inst., Dr. Sykes, Medical Officer of Health for St. Pancras, writes a letter to show that this entire site of just under two acres, the vacant area within being included, has a population of 430 persons per acre, as compared with the ratio of 54 per acre for the metropolis by the census taken in 1881. He argues that sanitary considerations quite forbid any more building over an area where the death-rate is double that of the rest of the parish.

WRITING in the *Times* of Monday, October 29 last, the Rev. C. E. T. Roberts, Vicar of St. Clement's, Potteries, Notting-hill, appeals for further subscriptions, —600*l.* being already promised,—towards the purchase of a recreation-ground. The field, of 4½ acres, lies in that poor and thickly-populated district where Pottery-lane still commemorates a past industry for which it was once known. Notting-hill "Potteries" lay between Notting Barn Farm and the district (southwards) where are now Norland and St. James's squares. Norland-square owes its name to Norlands, or Norland House, a former home of the Vulliamys, the famous clockmakers in Pall-mall. We spoke of that house, and its artesian well sunk in 1794, in our obituary notice (Nov. 20, 1886) of the late Mr. George John Vulliamy, architect. The well, as we were subsequently informed (see our "Note" of April 16, 1887), was sunk by George Vulliamy's grandfather. His father, Benjamin Louis Vulliamy, died on January 8, 1854, aged 74 years.

MR. ALBERT HARTSHORNE (Bradbourne Hall, Wirksworth) has in hand a work on seventeenth and eighteenth century wine-glasses and goblets. He will be glad of any notes of dated examples, with descriptions, and heights of such glasses, their shapes, and the fashion of their stems, and references to collections of such objects.

THE annual exhibition of old embroideries, brocades, and laces, at Messrs. Howell & James's, in Regent-street, is as interesting this year as ever. It must be difficult by this time to find anything of the kind that seems very fresh. We have seen so many embroidered Persian and Turkish table-covers and prayer carpets, and so many heavily embroidered Italian altar-frontals, vestments, and banners, of late years, and they are mostly so much alike, that, however beautiful a piece of such work may be, one too often has a feeling, when looking at it, that one has seen it over and over again previously. This is, however, not the case with the principal exhibits in the present collection, and the specimens of Spanish embroidery made in the convents of Manila, which are among them, have an especial air of freshness. The old Italian and Spanish ecclesiastical embroideries nevertheless hold their own, as probably they always will do, for richness of effect, harmonious colouring, and excellence of decorative design. Some of the old vestments in Messrs. Howell & James's galleries are in a wonderfully perfect state of preservation, but in others it has been necessary to work over the old silk ground—a proceeding which seems to produce a less satisfactory result than that obtained in other cases by transferring the embroidery to a new ground of similar material. A very fine piece of work is No. 73, a white satin coverlet embroidered with flowers in soft colours, with a centre composed of two hearts transfixed, across which is an undecipherable inscription. Another fine piece is No. 52—a part of a vestment richly worked in silk and

gold threads in Spanish basket stitch. Nos. 99 and 100 are beautiful specimens of Italian brocades, and we remarked also a piece of French work embroidered with chenilles, which has a very soft and pleasant effect. Among the laces, the finest specimen is No. 15, a piece of so-called "drawn work" worked over in point-lace stitches. The antique Cretan borders, in green, red, and terra-cotta, are also most interesting. The exhibition is to remain open for a month, and designers and makers of lace and embroidery might get many useful hints from an examination of such fine specimens of harmonious colouring and skilful and conscientious workmanship.

MR. WILLIAM MORRIS'S lecture on Tapestry at the Arts and Crafts Exhibition last week was an excellent lesson as to the value and meaning of decorative treatment in work of this class, as opposed to the pictorial treatment of the French Renaissance designers. This has been already urged, as we observed, in his essay prefixed to the catalogue of the Exhibition. The lesson will bear repetition, no doubt, though it is fortunately by no means as necessary now as it would have been twenty years ago. Few persons in England, with any pretence to culture, would now desire or admire tapestry designs of the Boucher school.

WE have received from Messrs. Longmans, Green, & Co. some specimen-copies of progressive drawing-books, price 2d. and 3d. a number, prepared "in accordance with the illustrated syllabus of the Science and Art Department." We presume, however, that they are not prepared under the authority of the Department, because we some time ago took notice of a somewhat similar series issued with the authority of the Department, and under the direction of Mr. Poynter. Those were, if we remember right, published at 6d. a number, so that these of Messrs. Longmans' issue have an advantage in cheapness. The first two or three numbers are evidently intended to afford the first elementary lessons in making lines or using the pencil at all, in the case of very young children. The majority of the lessons of this kind consist of geometrical figures in straight lines, or of single curves of various character, which are first to be copied on a dotted line which the pen or pencil is to follow, and then to be reproduced in freehand on the remaining space of the page, with or without some few dots to guide the eye to the leading proportions. The idea of making the pupil first follow out the lines on a dotted guide-line is a good one in the case of very young beginners, as it would accustom their fingers first to the mechanical effort of holding and guiding the pencil, leaving the effort of the eye to be made afterwards, when the hand has first had a little initiation into its work. The more advanced freehand copies of scrolls, artificial foliage, &c., are for the most part not nearly as good as those in the South Kensington books before referred to. The design and colouring of the wrapper of this set of instruction-books in drawing is one of the most unfortunate instances that could be shown of the national artistic deficiencies in taste which we still labour under. It might have been thought that a first-class publishing firm like Messrs. Longmans, if they wanted to print an ornamental cover on a cheap book of this kind, would have thought it worth while to get an artist to make them a sketch for it; but the English publisher is still far from understanding that. The design on the cover is one of the worst and most commonplace, in details and lettering and its detestable colour, that could well be seen; it is enough to frighten away any purchaser with the least eye for colour or design. A plain brown-paper wrapper would have been far preferable.

THE following letter, which will interest some of our readers, appeared in the *Times* of Monday last:—

"SOUTH LONDON ART GALLERY.

Sir,—Will you allow us, a few working men of South London, to ask for further help in our attempt



to keep before ourselves and our fellow-workmen and their families an ideal of a higher life than even technical education? Many generous friends have lent us several pictures and helped towards our expenses, and within the last twelve months more than 100,000 people, nearly all genuine artisans, have visited our art galleries. We spend less than 300*l.* yearly for every expense, including heavy rent, and towards this we have this year but 200*l.* We ask for donations towards our expenses, and for the loan of pictures for such times as their owners can spare them, however short. All letters should be sent to our secretary, Miss Oliver, and cheques should be crossed 'Roberts, Lubbock, & Co., account of South London Free Art Gallery.'

J. BISS, cigarmaker.  
M. BOUNDS, mason.  
W. BRAGG, carpenter.  
R. BROOKS, carpenter.  
R. BUTCHER, polisher.  
W. CLARK, slunter.

Free Art Gallery, 207, Camberwell-road,  
Nov. 2."

What particularly interested us in this appeal was to see this decided recognition, on the part of a group of artisans, of an ideal "higher even than technical education,"—in other words, the perception that there are other and higher intellectual interests than that of the scientific and economic treatment of material in manufacture, which practically, important though it be, is not quite "the be-all and the end-all here." We have taken an opportunity of visiting the exhibition for which this appeal is made. What we saw was a by no means despicable collection of works of art, exhibited in a good-sized shop and house in the Camberwell-road, in which the Free Library is also located. The collection includes a portrait by Vandyc, and some other first-rate works, lent by Lady Burdett-Coutts; a small picture and a series of oil-sketches of landscape by Sir F. Leighton; an original portrait and several copies of pictures by Mr. Watts; a cartoon, "Ministering Angels," by Mr. E. Burne-Jones; landscapes by Mr. John Collier; and many other good oil-paintings. In the shop, with their backs to the light, are the original drawings for Mr. Walter Crane's "Book of Old Songs," and scattered about are a number of the original drawings for the *Graphic* and for Messrs. Cassell's publications, to say nothing of several of Mr. Haig's etchings, and of engravings of Sir F. Leighton's and other works, and some first-rate photographs of landscape and architecture. The collection seems terribly cramped for room, and to be constantly changing, many of the loans being, we were informed, liable to be reclaimed at an hour's notice. It is, therefore, hardly to be wondered at that the arrangement is entirely without system. One thing we would suggest, and that is that the custodian, who evidently knows good from bad, would do well to get rid of a good many worthless prints and amateur sketches which are scattered about among the works of art in a very uncomplimentary way, which help to fill up valuable wall space, and too often attract the attention of ignorant visitors more than the good pictures.

WE are glad to see that the rector and churchwardens of St. Mary-le-Strand are appealing to the public for funds to put the church in thorough repair. They say, in a letter to the *Times* of the 6th:—

"We are anxious to restore it to its original state. To effect this it will be absolutely necessary to remove all the fractured stones and to cut out from the wall the iron chain bonds and cramps which have oxidised and split the stones, and which, unless removed, will continue to injure the building. The cost of thoroughly restoring the church and making it safe for public worship has been estimated by an architect of experience at about 3,000*l.* The parishioners are quite unable to defray the cost. The population of the parish is nearly 2,000, and those living behind the Strand are for the most part very poor people. The church in the Strand is the only place of worship which they can attend. It is, therefore, urgently necessary to solicit those who have the means to come forward as speedily as possible to save this beautiful building."

The writers quote the opinion of the Bishop of London (in which we quite concur) that "it would be a discredit to us in the eyes of all Europe if we show ourselves careless of such a work of art." The church is, in fact, the great architectural ornament of the

Strand, and is an object of admiration to visitors from other parts of the world. We hope the rector will get the money he wants; and, in the meantime, that he and the churchwardens will take care of the decorative vases which are now, or were recently, lying on the ground in a row just inside the church railing, and looking as if they were likely to share the fate of the Burlington House Colonnade. The first result of the appeal, however, has been to elicit an article in that cultured journal, the *Daily Telegraph*, urging the immediate pulling down of the church, to remove an obstruction from the Strand. The dogged Philistinism of the English daily press in regard to architecture is certainly a curious phenomenon. It has been several times pointed out, in our own columns, and we believe elsewhere, that the ultimate treatment for this part of the Strand will be to open up Holywell-street, and carry the Strand roadway on each side of the two churches. The property to the north of them is bound to be removed and built up in time, and a noble effect will then be combined with public convenience for traffic,—if the prophets of the *Daily Telegraph* will only spare us the churches till then!

#### THE PRESIDENT'S ADDRESS, ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AT the opening meeting for Session 1888-89 of the Royal Institute of British Architects, held on Monday evening last, at No. 9, Conduit-street, there was a crowded attendance. After some preliminary business, which will be found reported on p. 341.

The President, Mr. Alfred Waterhouse, R.A., rose amidst considerable applause to deliver his inaugural address. He said:—

Gentlemen and Colleagues,—The task of addressing you, on the opening meeting of a new session, is one which becomes to him, whoever he may be, who occupies this Chair more and more difficult. The interesting "Journal of Proceedings" published by the Institute, and our many professional journals, record everything that has happened of architectural interest and moment during the year: successes achieved, new inventions likely to be of service to us, important publications, architectural meetings, and notices of members whose deaths we have to deplore.

When I look at the addresses given by former presidents on occasions similar to the present, I feel that I cannot hope to say much that is new on the topics which of late years have so much interested you, and which have formed the staple of such addresses, nor approach the ability with which my predecessors have handled these themes. I must ask your indulgence, therefore, if I pass with slight reference many of the questions so ably treated by them, and refer to others, which, if not equally important, have at least been to me the object of some thought.

The most important event of our last session is undoubtedly the passing of the new By-laws under the provisions of the supplemental Charter granted last year, though they have not even yet received the approval of the Privy Council (applause). The chief feature of this new instrument is the Examination (no longer voluntary, but obligatory) through which for the future the ranks of our Association will have to be recruited. I look upon this as an immense stride in the right direction, first as an incentive to the student to study, and secondly as showing him the direction in which he ought to study; pointing out to him the sources from which he can acquire the knowledge necessary to pass the Examination with credit to himself. There has hitherto been, from what I have seen of architectural pupils, not so much a want of will to study diligently as an uncertainty as to the way. The way is now made clear, and from the commencement of his articles the student of the future will know, if he cares to know, what he has to make for, and accomplish, before he can be recognised either by himself or others as one fit to practise as an architect (hear, hear). This is likely to be of incalculable advantage to our profession, and we owe a debt of gratitude to those who have so long and so earnestly laboured to establish these examinations, and to perfect the machinery by which they are conducted. May they go on in this good work,

gradually raising the standard of requirements so that in time the Examination for admission may completely satisfy the public that those who have passed it are men armed at all points and ready, so far as their intellectual acquirements are concerned, to do credit to their position as Associates and future Fellows of the Royal Institute of British Architects (applause).

A President of the Architectural Association said, in a recent address, that "the recognition of our profession depends upon each individual one of us." This is most true, and, lived up to would incline us, perhaps, to think less of "Registration," the advantages of which have been much debated during the past year, some architects thinking it of great importance and others being strongly of a different opinion (hear, hear). As is well known to you, a Bill was introduced into Parliament last session by means of which architects, engineers, and surveyors were all unceremoniously to be huddled together in one act of registration. The Bill would, if carried, instead of narrowing the several professions interested to their most competent members only, have tended, for generation at any rate, to injuriously widen them by giving a certain legal status to those who otherwise could have no claim as fit to practise in any of them, and in this way would have done incalculable mischief (applause). The Bill was vigorously opposed by the recognised representative bodies of all three professions, and, after a brief but satisfactory debate on the second reading in the House of Commons, was withdrawn; not, however, so far as we were concerned, before considerable trouble and expense had been incurred. The whole scheme was, in my humble opinion, a beginning at the wrong end (hear, hear). Education is what we want—not registration (hear, hear). To the student I would say, "Prepare for the Institute Examination so as to pass it creditably without resort to cram, and so become Associates and Fellows of this body. You will then be registered architects in an effective use of the term" (hear, hear). In my opinion we want no other registration, and ought to be content with nothing short of this (applause). Older men, who had none of these advantages and find ourselves, perhaps, too rusty to pass the ordeal, must be content to offer our experience in lieu of it, and get on as best we may. Our younger brethren have a brighter future before them. The number of students passing last session (68) encourages me to believe that they are beginning to appreciate their opportunities.

The article by Mr. Connon, published in our "Journal of Proceedings" in November of last year, is a most valuable contribution to the subject, though, for my part, I should be inclined to try the result of the present examinations for entrance into this body before calling for the compulsory education of all architects. It may at last have to come to that, and the course, registration will follow. Let us, in the meanwhile, have as large a body of competent architects to register as possible. The more we have, the more we are likely to have for, if apathy is contagious at present, the prospect of successful application towards the attainment of a definite aim will be contagious also. The entreaties of the master have often less effect upon a naturally indifferent pupil than the example of his fellows.

The other subject, somewhat allied to the questions, which was confided to the care of the Institute by the General Conference of last year—that of Federation, was most thoroughly considered by the Committee appointed for the purpose. Their recommendations were adopted by the Council, and a series of By-laws authorising the alliance of any non-metropolitan architectural society in the United Kingdom, India, and the Colonies with the Institute, under certain regulations, is the result (applause).

The new Local Government Act has not made any provision for the proper examination of technical officers employed by the Urban and Rural Authorities. Surveyors have hitherto qualified for certain appointments by examinations held under the direction of a Board of Examiners of this Institute—a proceeding which has worked well, and been of great public service. Your Council have done the utmost, both while the Bill was under consideration in the Commons, and also in the Lords, to call the attention of those responsible for it to this defect, but without success, probably owing to the haste with which it was hurried through its later stages. It is to be hoped that if in the future the Act comes to



her amended and enlarged, as we are advised that it shall be, our recommendations be listened to. Such a provision has been made to secure the proper qualification of all Officers to be employed by the County Councils, and it is obvious that the Surveyors, and Rural, so employed should also be persons whose fitness for the very important duties they are called upon to perform has been in every case properly attested (hear, hear).

The Imperial Institute building is making progress, under the skilful superintendence of Mr. Colcott, and promises, when complete, to be a very imposing structure. Our late lamented friend implied in his last address that, if it were considered that the President of the Royal Academy (our Honorary Associate), represented Architecture as well as Painting and Sculpture (and so he does, and most ably), the representation of Architecture was conspicuously absent on the Executive Council of the Imperial Institute; but I have now good reason to think that Architecture will be represented on it, such a representation is likely to be of much use both to our colonies and to the profession at home and abroad (applause). Mr. Anson's suggestion that the Imperial Institute might fitly collect a complete record of the architectural wonders of our Indian Empire appeared to me most valuable, and I trust it will be the right time brought before the notice of the Executive.

In this case we may congratulate ourselves on being likely to have a public building which will be fairly seen at any rate on two sides, though, had it been placed on the north side of the street instead of being set back from a road so wide, its effect would have been considerably enhanced (hear, hear). The idea of confining anything in the way of space for the architectural splendour and effect seems alien to the English nature,—at any rate, our tastes are rarely, if ever, preserved for our own use, and, if we have, we are inclined to elaborate efforts, owing, I suppose, to there being no supreme special authority to decide questions. It does not appear to be generally appreciated that an elaborate design ought to have a southern aspect if its beauties are to be fully enjoyed, and as a building's site is not invariably determined upon before its site is chosen (except in the case of private dwellings), there is at present nothing for us but to get the best of what are often unworthy sites. If we go abroad we at once see that things are better ordered in this respect. Look at the Palais de Justice of Brussels. Its commanding position on the crest of a hill overlooking the old town, the open spaces which surround it, its magnificent Salle des Pas-de-Loi, its stately staircases in the Salle itself, that leading up to it from the lower town, never may be thought of the design of the building itself, show the advantages which have been secured by allowing ample space, both in and without, for architectural display; to what good purpose the skilful architect turned them, internally at any rate, in giving artistic effect. It is instructive also to note that the cost of so noble a work should be defrayed by so small a country as Belgium, cost equal, if I remember rightly, to about one head of the entire population.

Vienna also sets an example for imitation in this respect. The demolition of her ancient fortifications has given her a splendid opportunity for the erection of magnificent buildings worthy sites (as we had on our Embankment), and to good purpose she appears to be using those sites. If we examine the plan of the Parliament Houses, designed by our Royal Architectural Medalist for this year, Baron von Hansen, we shall have an instance of this. There is a serious stiffness about the building which does not often fall to the lot of an English architect to be able to achieve. Contrast this with our own Palace of Justice, jammed in on one side (for the present unoccupied ground to the west is, I believe, reserved for the building's extension). In Brussels or Vienna they would have had wider and better-lighted courtyards, but these advantages would have involved extra space, and of this there was no room on the restricted Law Courts' site without giving up some of the accommodation intended. It is impossible adequately to see the building from any side. The improved approach to it from the north have yet to be made.

On the other hand, the domestic buildings of this country are without rivals elsewhere. Compare an English country-house, erected in accordance with the designs of any of our architects who

have made themselves a reputation for such work, with a modern French *château*—even with the published ideal of Viollet-le-Duc—and the superiority of the English work is evident; and not only in sanitary appliances is this superiority apparent, but the arrangements of plan to promote comfort, and the air of homeliness which pervades the vast majority of modern English houses, have, I believe, never been approached in former times or in any other country. America may be very near us in this matter. She has certainly surpassed Europe in the originality and boldness of some of her buildings for other purposes, but the English home is still unrivalled in its quiet attractions. One can hardly leave the home without a word about the garden which surrounds it, and which adds so much to its charm. If those of us who devote our attention to domestic architecture were to make more of a study of landscape gardening than we do, I believe that there would be more complete harmony between the house and its surroundings than is now often the case; while to the architect himself there can hardly be a more delightful change of occupation than to turn from the disappointments inseparable from building operations, to the development of those surroundings in which Nature is to play her part; as those know from experience whose clients have sought their advice in the garden as well as in the house. In the "Journal of Proceedings" we have been recommended on the one hand to turn to the grand style—that is, the formal garden of the seventeenth century; on the other, to give a free hand to the picturesque. But what may suit one house and one site may not suit another. In my opinion advantage would result if we cared to qualify ourselves to give an intelligent opinion on what may add so immensely to the attractions of our work as architects, or do so much to ruin its effects.

To return from country to town. The schemes for the improvement of communication in London too often leave much to be desired. The properties adjacent to those actually interfered with by such new thoroughfares should, if possible, also be scheduled where necessary to secure eligible building sites; and so prevent difficulties of light and air, do away with jobbing, and give the public some more adequate return for the cost of a new street. Instead of which, building plots on the streets recently made through the heart of London have been too much composed merely of frontage, with rookeries of dilapidated tenements in the rear, whose proprietors through their representatives have reaped a harvest of compensation for injured lights.

The effect of new streets upon the adjacent existing architecture ought also to be most carefully considered, and, if unsatisfactory, some means should be taken to mitigate the awkward blemishes thus occasioned (hear, hear). The way in which the southern end of Shaftesbury-avenue has destroyed one of the segments of Piccadilly-circus is unfortunate (applause), however welcome the open space thus created may be in itself. The erection of a statue, which appears to have been contemplated, on the triangular island west of the Avenue, would do little or nothing to remedy the now somewhat unpleasant grouping of the surrounding buildings; but three plane-trees planted at the corners of the island would, by their soft outlines, obliterate, in measure at any rate, the architectural discord which has been created, and add a charm to a somewhat meaningless open space. They would not, of course, prevent the erection of a group of statuary or a fountain in the centre.

Members of the Institute have, from time to time, made very pertinent remarks on the subject of our unfair and oppressive law with regard to the rights which one neighbour may acquire over another's property by putting out windows overlooking the latter, and so restricting its use as a building site. This is pre-eminently a subject for the attention of the Institute; and surely, if it were gone about in the right way and with sufficient energy, an Act might be passed removing, to a certain extent at any rate, one of the greatest sources of annoyance and expense incident to building in towns. We know that in Scotland no such vexatious restrictions exist. I believe in America there is similar freedom. In France, too, the difficulties of the building owner are as nothing compared to what they are with us, though he is subject to the very proper regulation that the extreme elevations of buildings lining streets should bear a certain proportion to the width of the street. The un-

reasonable enjoyment of light which a dominant owner may have been blessed with for a certain period, simply because his neighbour has delayed the exercise of his own rights during that period, should be no cause, it appears to me, why he should be left in undisturbed possession of such unreasonable enjoyment for ever, to the detriment of his neighbour and his successors. Unfortunately, the length of time that the present law on the subject has run presents serious, but I trust not insuperable, difficulties in the way of an alteration for the better (applause).

But though we may long for this, there is something to be said on the other side. As artists, we must often have to deplore the excessive height to which our buildings have been allowed to go when unrestricted by questions of light and air, not so much on their own account perhaps as because of their injury to neighbouring buildings. The effect of many a fair and beautifully-proportioned building of modest height has been utterly destroyed by the overgrowth of some upstart by its side; and, though we may not always be able to control our clients in this respect, I feel sure that no true artist would willingly by his own work injure that of another. Nor are architects the only offenders against good taste in this respect. There are works of sculpture which I think are on too gigantic a scale for their surroundings. Nobody who observes these things would regret if His Majesty George IV. were not so prominent an object when seen in front of St. Martin's Church, of which it destroys the scale; and the same may be said of other monuments in the vicinity (hear, hear). In contrast, I would call attention to the old statue of Charles I. and to that of General Gordon by Mr. Thornycroft, just erected in the centre of Trafalgar-square (hear, hear). The figure here is but 9 ft. 6 in. high, and the pedestal, the object of evident consideration on the part of the sculptor, is correspondingly modest in size. The statue does not fail to attract due attention, though it cannot be said to dwarf anything in its neighbourhood.

During the past year we have had to lament, and do still lament, the death of several influential members of this Society. January was a fatal month. George Godwin, the founder of the Bursary for the Study of Modern Architecture, a prominent figure in the architectural world for nearly fifty years, and an active Member of the Royal Commission on the Housing of the Poor, died on the 27th; our President, Mr. Anson, on the 30th; and M. Questel, our Corresponding Member, and the Senior Architect Academician of the Institut de France, on the same day. Our late President, like Street, died during his term of office. He was seventy-six, looked back upon more than half a century of practice, and was universally respected and held in honour by all who knew him (hear, hear).

Then there was Edmund Woodthorpe. Though by the measure of years he had attained the age of seventy-five, he was the most juvenile among us whenever he appeared. Long will his joyous tones and genial wit dwell in our memories, and make us lament the removal of so young and elastic a spirit (hear, hear).

Joseph Clarke, past Vice-President, whose death I have also to record, was identified with the Gothic revival by his numerous churches, the active part he took in the establishment of the Architectural Museum, and the unflagging energy with which he promoted its interests.

Nor must I omit the name of Richard Popplewell Pullan from the list of our losses. He and I sat side by side as fellow-pupils of Mr. Lane, of Manchester. He then showed his powers as an artist, and his great interest in ecclesiology and kindred subjects. His practice as an architect was not great, but he devoted himself with enthusiasm and success to archaeological pursuits. His works in conjunction with M. Texier on Ancient Remains in Asia Minor, and on Byzantine Architecture, are of lasting value. We are indebted to him also for the publication of some of the drawings left by his brother-in-law, William Burges.

The Institute has also lost Mr. T. Gambier Parry, who had been an Hon. Member since 1865, and whose services to architecture and the subsidiary arts were of a high order; his latest literary work, entitled "The Ministry of Fine Art," and published in 1886, is a series of thoughtful essays on subjects which their author was peculiarly fitted to discuss. Another death, that of John Pennethorne, who first detected the horizontal curves of the Parthenon, and to whose memory a just tribute has been paid by



Mr. Penrose, occurred in January of the current year.

Our sympathy must be offered to our Scotch brethren in the recent loss of one of their most prominent members, James Sellars, President of the Glasgow Institute of Architects. He died comparatively young, but not before having made his mark in his native city, the International Exhibition buildings being one of his latest successes. His high character and engaging kindness of manner made him hosts of friends to lament the premature shortening of a career in which he had already done so much so worthily (applause).

The biographies of two of our most remarkable modern architects, which have both appeared since November last, are of great interest. George Edmund Street's "Life," by his son, has about it an unusual freshness and charm, arising partly from the father's marked individuality of character, and partly from the skill with which the materials for his "Life" have been put together. In amazing power and energy, love of work, beauty of draughtsmanship, and skill as a designer, he can hardly have had his equal. His sterling honesty of purpose and kindness of nature, even if occasionally hidden behind a determined manner, endeared him to those who knew him best. He was the most thorough and consistent supporter of revived Mediaeval architecture throughout his remarkable career—a career full of interest to every architect from the days of his pupilage under Carter to his burial in Westminster Abbey. His Presidential Address from this chair is probably the most outspoken we have ever listened to. His lectures as Professor of Architecture at the Royal Academy supplement his "Life," and should be in the hands of every student.

The other biography I would allude to is that of a very different but also very remarkable man, Henry Hobson Richardson, of Boston, U.S.A., an Honorary Corresponding Member. Street was the king of draughtsmen, and drew every detail of his innumerable buildings himself. Richardson, on the other hand, was supposed never to have designed one of his later and more perfect buildings with his own hands; yet no architect ever put his name to structures which were more unmistakably his own creation. Street made the pointed arch the key-note of all his construction; Richardson saw the capabilities of the round arch, and his work in great measure was based upon Romanesque, though he treated it in his own original fashion. His works are so remarkable that I feel sure you will allow me to say a little more on a subject which has for me a singular fascination.

Richardson was a student of the Ecole des Beaux Arts. He remained in Paris six years, working as a student and draughtsman, for he had to earn a living as well as to study, and lived practically two lives in one. In those days his great ambition was to go to Athens and Rome. He never, in fact, went to either, and in spite of his training, never was architect, less influenced by what these two centres of past art would have had to teach him. On his return to America in 1866, his first designs were in thirteenth-century Gothic, and in no way remarkable. But in 1870 he gained in competition the execution of Brattle-square Church in Boston, a building remarkable for its campanile with deep sculptured frieze, a tower so original as to be like nothing he could have seen or heard of elsewhere, though it has about it a certain Romanesque air. The neighbouring Trinity Church followed soon after, with a central tower of excellent proportions, both in itself and as part of the composition of which it was, of course, the crowning feature. In construction it is no less bold than its detail is beautiful. Its weight of 3,500 tons is supported by four granite piers with a collective area of 100 square feet. His public libraries, of which he built several, have a family likeness in their plan and style, though each proclaims its distinctive character. His Pittsburg Court House, Field's Chicago Buildings, and Cincinnati Chamber of Commerce are buildings of a monumental character, and give evidence of an original creative mind, free from prejudice and unfettered by precedent. Richardson's peculiarities may be seen in all. These peculiarities appear to be chiefly the discarding of the orders, the Romanesque feeling, admirable planning, appearance of strength and solidity, the value put upon mere wall surface whenever attainable, the treatment of this surface by the varied coursing of the stonework, and the contrast between tooled and rough surfaces; the use of coloured materials, especially of stone of different hues; battered

bases, sparing use of string-courses, the introduction of deep voussours, the rounding of salient angles, and a leaning to circular forms on plan. In his later work his corbels are rounded and covered with delicate incised carving instead of mouldings, and his capitals are convex rather than concave. All these peculiarities appear to be based on sound judgment, and to be excellent in every way. On the other hand, if criticism were in such a case allowable, there seems, to my eye, almost an affectation in the shortness of some of his columns, and want of height in many of his circular archways. There is something ungainly in the upper part of transomed windows being made wider than they are high. It is also to be regretted that in many of his buildings the ridge and hip tiles and gable finials appear to be so heavy as to dwarf the general effect. In 1862 Richardson visited for the first time Southern France, Northern Italy, and Northern Spain, and only then saw the best specimens of architecture from which he drew his inspiration. The effect of this tour, though he allowed himself no time for sketching, is visible in the works he executed in the short time afterwards left him. His becoming so devoted to, and so skillful an originator in, a style the best examples of which he had not seen, is in itself extraordinary, unless, indeed, a Romanesque wave had affected the American architectural mind before his advent. He seems to have created a new-born interest in architecture in America, perhaps by doing exactly what he thought best suited to the expression of his buildings, without going out of his way to look for precedents. In consequence, his work is never commonplace. He has left behind him a school of young Americans who appear to be following his steps in developing the capabilities of Romanesque Art,—an art which, we must bear in mind, did not die of inherent weakness, but was extinguished before its time in the twelfth century by the difficulties of vaulting oblong spaces, and the consequent introduction of the pointed arch. I have, perhaps, said enough to show that Richardson's "Life," by Mrs. Van Rensselaer, illustrated by photographs of his works, is worthy of earnest study (applause).

An appeal has just been issued by M. César Daly to his brother-architects of France, England, and America, in favour of what he calls the "Hautes-Études." He would have those who are interested in, and gifted for the work, seek for the causes which have affected architecture in different times and places, and given it its varied outward development. He is sanguine that such search for first principles would lead to progress, and tend to check pure archaeological work on the one hand, and irrational eclecticism on the other, which he describes as the pilage, more or less skilful, of old monuments, but not the conservation of great traditions. He condemns the present fashion of following our individual tastes, each architect being a law unto himself, and laments that Duc's prize for an "Essay to determine the style and form of modern architecture" has not been properly competed for. The "Hautes-Études," if set about in earnest, ought to do much to remedy these and other evils so eloquently set forth in the appeal. M. Daly proposes an International Congress of Architects to be held in Paris next year during the great Centenary Exhibition, for the purpose of considering these higher questions. All must heartily wish him success in these his persistent endeavours to advance our art by a deeper and more systematic study of its principles.

Of new publications within the year I must mention Professor Hayer Lewis's "Holy Places of Jerusalem," which will appeal to various classes of readers. By his intimate acquaintance with the authors, ancient and modern, whose works bear on the subject, and by his conscientious study, on the spot, of buildings which illustrate his theories, the writer has produced a work of unusual interest.

Mr. R. Phené Spiers's book on "Architectural Drawing" has brought a valuable addition to the architect's library. His subject is handled with such care and thoroughness that draughtsmen must find in his letterpress and illustrations much to interest and instruct.

Mr. Alexander Graham and Mr. H. S. Ashbee, in their "Travels in Tunisia," describe a ruined country in lively fascinating style. The work is replete with valuable information, not only on architectural and archaeological subjects, but on the everyday matters of life and ordinary commerce. They give also an excellent biblio-

graphy of the country they describe, and their book is a guide of great value to the traveller, and search not only of general knowledge, but of deeper acquaintance with the remains of Roman civilisation in an important part of Northern Africa than falls to the lot of the ordinary tourist.

Our profession being, in an especial degree, among the fine arts, based upon study of the past, the value of historical research respecting it, and of pictorial reproduction of the works of great masters, can hardly be overrated; and I am, therefore, induced to mention a large folio work\* upon which our esteemed Member, Baron de Geymüller, in concert with other distinguished men, is now engaged. It is proposed to do, under his superintendence, for Tuscan what has already been done for the Renaissance works of Rome, in the illustration and analysis of great public and private buildings. Baron de Geymüller has presented to the Library the first two numbers, and our "Journal of Proceedings" will from time to time contain detailed notices of this valuable work.

Of the numberless exhibitions of the year that of the "Arts and Crafts" is one to which we may give a more cordial welcome (applause). It brings into notice those arts to which the ordinary picture exhibition turns the cold shoulder, and which, delightful in themselves, are essential to the architect. The decorative artist and the art workman have, within the walls of this exhibition, an opportunity of length afforded them of making themselves known to a wider and appreciative public.

The important questions to which I have been alluding,—the direction and design of new streets, the law of light and air, the heights of new buildings and their relation to the width of the streets,—are all subjects pre-eminently to be submitted at no distant date for the consideration of the new Council of the County of London, of which I am glad to think our distinguished Hon. Fellow, the Duke of Westminster, is to be the first Lord-Lieutenant. They are, however, other questions of like importance as far as we architects are concerned, which, if we choose, of our own will settle,—or, at least, bring to such a point as will conduce to future settlement, when our profession is, perhaps, in a more homogeneous condition than it is at present, and when uniformity of professional practice will be regarded as necessary to the position and welfare of the members of the liberal profession (hear, hear).

My predecessor, in his first Address to you, Gentlemen, from this Chair, urged us to remember that the Institute and the profession are in principle one and the same force, inseparable and indistinguishable one from the other. I entirely agree with the proposition, and in my opinion the first duty of the Institute is to guard the honour of the profession (applause)—to take care that its members are nothing derogatory to their professional character; or, at the worst, that they shall not do so with impunity (hear, hear). I am not alluding to illicit or surreptitious commissions or allowances, or of the offers sometimes made of something by way of consideration for employing certain people or their wares on clients' works. I trust that, owing to the powers vested in the Institute and the high feeling of its members, such malpractices are of the past. I mean that when any of us undertake duties of public trust, whether it be in an honorary or a paid capacity, in any office or on any Council or Board, we ought scrupulously avoid using our position for private ends or gains, whether as professional men or as individuals. In an address delivered nearly ten years ago from this chair, at the opening of the Session for 1879-80, the late Mr. Whichcord referred to the Metropolitan Board of Works and the professional men who might be members of it in the following terms:—

"Architects may be elected members of the Board just as barristers, solicitors, and doctors may be so elected. It would be ridiculous to say that professional men shall not sit at that Board because they may have had a pecuniary interest in some of its building transactions. But I shall run the risk of censure when I say that a Fellow or an Associate of this Institute, if he be elected a member of the Metropolitan Board of Works, ought not, from the moment, to have any professional connexion whatsoever with the purchase of land offered for sale or lease to the Board; nor should he be professionally engaged in the superintendence of buildings to be erected and which the property of ratepayers whose aid and representative he is" (applause).

\* "Architectur der Renaissance in Toscana nach werken der meister geordnet." Munich, Published, continued by Dr. Karl von Stegmann. Members should examine the two Parts in the Library.



The late Mr. Street, in 1881, repeated those words, as I have just done; and I cannot but think that the advice they offer, or the warning they convey, may be advantageously studied by who aspire to sit on the County Councils at about to be summoned under the provisions of the new Local Government Act. If the Institute is still to flourish,—if the character of the profession is to be maintained,—it must be by jealously raising the standard of conduct of the individual members rather than allowing to be lowered through the indulgence of any od-natured laxity (loud applause).

We need not despair of success in stamping out abuses if only we are convinced of the necessity of so doing, and are earnest in the endeavour. Something, at least, has been done in the last few years to render architectural competition less liable to unfairness and absurdity than before. It is now well understood that there is one man who must not under any circumstances undertake the office of architect of the building competed for, and that is the selector. Nothing would be easier for an assessor than to play cuckoo to the poor hedgehogs of competitors, who are pretty much his mercy, and nothing obviously more unfair. It is such an abuse, if it has occurred, may now be considered a thing of the past.

There is another point of professional practice which we might probably see more justly than at present. We are in the habit of regarding the Bills of Quantities issued to competing builders as final instruments, incapable of containing error unless the successful builder does it out between the day on which he signs his estimate, and the day on which he signs his contract, which may be the day after. Are we in these matters as scrupulous as we ought to be that justice be done to the builder? His, owing to the severity of the competition to which he is generally subjected, is a sufficiently hard one, without our making him practically responsible for other men's errors. Our Scotch brethren measure up the work after completion, though competed for in the ordinary way on preliminary bills of quantities. If we are not spared for that, let us at least be willing to allow for the correction of errors in taking out the quantities, when it is obvious that omissions have been made (hear, hear). Some few architects are in the habit of telling their clients that they must not hold their surveyor personally responsible for the correctness of his quantities, but that he is a man of position, will do his work with the greatest care, and allow a margin for contingencies. I have rarely met with an employer who failed to see the justice and even advantage of such an arrangement. There would be obvious convenience and uniformity of usage in this matter, and in other points of professional practice also; for instance, I believe great divergence of opinion exists as to whether an architect is bound to do more than one set of drawings, or of copies of his drawings, for the use of the works. I have until lately adhered to the view that he is not, but the great facility now offered by the ferro-prussiate sun-printing and other modern processes enabling us to reproduce an unlimited number of copies of a tracing without the possibility of error, and thus saving all trouble of re-amination, seems to put this question in a new light. I am of opinion that the Institute might suggest a mode by which a somewhat more generous supply of fac-similes of the contract and detail drawings might be supplied gratis to the contractor with little more expense to the architect than at present (hear, hear).

To things are obvious, the necessity of relieving payment from the builder for additional copies of drawings should be done away with, and uniformity of practice in this matter should be aimed at. It is known that in France, where, owing to the great number of independent contractors employed on the same work, the "duplication of drawings is a more serious matter than with us, the architect, nevertheless, considers it part of his duty to supply them all without extra charge. The great number of drawings required by municipal and other corporate authorities is also a considerable tax on us or our clients, and it would be well if all bodies could be persuaded to take mounted copies instead of tracings on cloth.

Then there is the desirability of a more liberal application of the arbitration clauses (Nos. 20 and 21)\* of the "Conditions of Conditions

of Building Contracts," sanctioned by the Institute and agreed to with the representative builders of the country. I know that there are architects who put in the building contracts they make, as the agents of their employer, a clause to the effect that the architect is to be sole judge, arbitrator, or umpire in any dispute which may arise between the two parties,—the architect, as the agent of his employer, being one of the said parties; and I know that there are builders,—sharp, shrewd, and alive to their own interests,—who are willing to put their names to such documents; but it is a practice of doubtful expediency, and I urge upon the young men who are here to-night, before they impose arbitrary conditions of the kind, to reflect that no man can be fairly or safely judge and party in the same case (hear, hear).

We have heard something lately of the conflicting terms "professional man" and "artist" as applied to the architect. Now in my opinion the true architect is both. The higher and more systematic education, which we are hoping for and getting, will train us in the efficient and easy practice of our profession,—a profession which is open to all men of education, intelligence, and industry, and one in which the greatest successes will attend those to whom further an artistic perception has been given, and in whom it has been carefully cultivated. In speaking of an architect as an artist I do not mean that he is to be a clever draughtsman merely,—far from it. A man may be the most exquisite of draughtsmen, and yet be entirely deficient in the critical sense of what it is that makes a work of architecture beautiful. His works then will not be beautiful, and, so far as his artistic career is concerned, he will not be an artist. While not neglecting to cultivate our powers of delineation, we might, perhaps, do more to make those powers of use to us than many of us do at present. If, for instance, instead of sketching ancient examples so much, we were content to do half as much in this way, and afterwards were to endeavour to reproduce our sketches and scale drawings from memory, we should accomplish two things,—marvellously sharpen our observing powers, and greatly increase our facility in design. We should make the building we are studying our own; it would be in our heads and not merely in our sketch-books. Our memory drawings would be tinged with our own individuality and shortcomings, which it would be well to correct by after-reference to our original drawings, or, better still, to the building itself if accessible. And, further, if time could be spared to analyse the sources of our satisfaction in the object of our study, to take notes of its excellences or defects of plan, construction, and detail, that time would not be lost; though we might have less to show to admiring friends, fewer trophies to hang on their walls as evidence of our industry and powers of draughtsmanship on our return from a tour, the result of victory in some Institute prize competition. I wish it were possible for the Institute to discover, not merely what our prizeholders draw during their tours, but what they have learnt, what they have assimilated, what has become part of themselves (hear, hear). I believe the study of one excellent

through no fault of the contractors, or by reason or on account of any directions or requisitions of the architect, involving increased cost to the contractors beyond the cost properly attending the carrying out of the signed drawings and specification, or as to the works having been duly completed, or as to the construction of these presents, or as to any other matter or thing arising under or out of this contract except as to matters left during the progress of the works to the sole decision or requisition of the architect under clauses Nos. 1, 8, and 10, or in case the contractors shall be dissatisfied with any certificate of the architect under clause No. 7, or under the proviso in clause No. 16, or in case he shall withhold or not give any certificate to which they may be entitled, then such question, dispute, or difference, or such certificate, or the value or matter which should be certified, as the case may be, is to be from time to time referred to the arbitration of a final decision of..... architect, or in the event of his death or unwillingness to act, then of his..... architect, or in the event of his death or unwillingness to act, then of an architect being a Fellow of the Royal Institute of British Architects, to be appointed on the request of either party by the President for the time being of such Institute, and the award of such referee is to be equivalent to a certificate of the architect, and the contractors are to be paid accordingly.

21. Upon every or any such reference the costs of and incidental to the reference and award respectively shall be in the discretion of the referee or arbitrator, who may determine the amount thereof or direct the same to be taxed as between solicitor and client, or as between party and party, or otherwise, and may award and direct by whom and to whom and in what manner the same shall be borne and paid, and this submission may be made a Rule of any Division of the High Court of Justice upon the application of either party, who may instruct Counsel to consent thereto for the other party without any notice being given to such party.

example,—say a church,—if thoroughly done, would do more to make an architect than rushing, sketch-book in hand, through half the cities of the world, even if years were spent in this sort of travel. I speak not as one who has already attained to any sort of excellence in this way, though I begin to see clearly what I have lost by not practising it.

It is to our young architects that we look for triumphs in the future. We rejoice in the prosperity and vitality of the Architectural Association, and make its members again welcome to the use of this room for their Friday evening meetings (applause). The desirability of establishing a kind of "Common Room," in which the young and old of our profession may meet and exchange ideas, was strongly urged by Mr. Appleton in his recent address. I can only repeat that in this, as in all other things, the Institute will help the Association as far as lies in its power. The annual prizes which the Institute has to bestow, through the munificence of its members, are largely competed for, as they should be, by members of the Association. There is certainly a most encouraging excellence in the draughtsmanship of many of the designs sent in, and I think also in design itself there is to be noted an advance on former years. When the prizes were distributed last, it was remarked how few of those we wished thus to honour were present to receive their rewards. This was to be regretted, as it is always a pleasure to those who meet here to see, and it may be make the acquaintance of, their younger brethren who have so distinguished themselves. At the Royal Academy, the prizes won are not given at all unless the victors present themselves on the occasion appointed for their distribution. On behalf of competitors for travelling studentships, I would express the hope that means may be devised to reduce the length of time during which it is compulsory for the student to travel if the sum awarded fall very far short of the expenses likely to be incurred. The Soane 50L studentship, for instance, involves a six months' tour. More may now be done in a shorter time than formerly, but at a proportionately greater outlay, and the inadequacy of the sum to cover the expenses of so long a period of travel no doubt prevents many, who would otherwise be inclined to contest the prize, from entering the lists.

Our reverence for the excellence of our forefathers' work, and our delight in what has been superadded to that excellence by the finger of Time, making it yet more lovely, is a characteristic of our own day, and will induce us to deal tenderly with old work when it comes under our care. But there are now, unfortunately, not many buildings left upon which the architect and workman can exercise their forbearance and show their reverence for the "charm of mutilation and the fascination of decay." It may be proper to enlarge, add to, or even pull down old work for new, but surely never to endeavour to make old work look like new. The mischief which has been done in this way in England is immense, but nothing to what has been endured in France and Italy. Now a better state of feeling on the subject of restoration is gradually extending to the latter country. If they appear to agree with us in theory, however, they do not yet altogether in practice. When in Venice last Spring I looked out in vain for an old friend, the Fondaco dei Turchi, by the Rialto. It had been rebuilt, and failed altogether to recall the impression of the old building which it is supposed to reproduce. Occasionally we may see our way to replace old work when research has made clear to us what it was originally, as Scott did at St. David's, and as Mr. Pearson is doing at Westminster Hall. Such cases must, however, be exceptional. It is certain that the past did not respect its own past as we do ours, and our practice, commendable as I think it, has, no doubt, its dangers. If we are for ever dwelling on the past, we shall not be self-reliant; and if not self-reliant, we shall never be bold originating architects (hear, hear). The Greeks spent their powers as artists in perfecting their own work, not in resuscitating a dead style; our mediæval brethren theirs in the marvellous development of their own phase of architecture; the artists of the Renaissance, in spite of their name, were likewise originators. It has been left to us to copy, or, as M. Daly puts it, "to pillage ancient monuments"; not, like the church-builders of Byzantium and Venice, by boldly robbing other buildings, to create fresh architectural marvels out of the material thus provided, but by reproducing old forms, with more or less

\* 20. Provided always that in case any question, dispute, or difference shall arise between the employer, or the architect, or the contractor, or the contractors, as to the conditions, if any, ought in fairness to be made to the conditions of the contract by reason of the works being delayed



ability, but also with more or less inappropriateness. Does it not behave us occasionally to consider this question seriously, and to ask ourselves to what good end this eternal copying and adaptation is to lead? We see that in America they are shaking themselves free from tradition. No doubt it is comparatively easy for them to do so; but are we to allow them to monopolise the guidance of common sense in architecture? May we not also make greater efforts than we have hitherto done to express the purpose of our works in a language of our own; to clothe our buildings, not in the cast-off garments of bygone ages, but in materials cut out and fashioned to suit ourselves and our own needs? We may love and reverence the past as archaeologists, but as architects let us not forget that archaeology is the bane of living progressive architecture, and that if our art is ever again to evoke popular enthusiasm, it must do so by embodying the thoughts, the aspirations, and the genius of the living people for whom we build (hear, hear).

I fear I have already tried your patience (No, no), so I will detain you no longer, but conclude these somewhat discursive remarks by expressing the hope that we may all, both in our private practice and as members of this body corporate, do our utmost to give our art a firmer hold on public admiration and attention, and our profession respected by all with whom we come in contact, so that every member of the Royal Institute of British Architects, whether his work be lovely or not, may, at any rate, show in his life the things that are honest and of good report (loud applause).

Of the speeches which followed the address we give a report on a subsequent page.

#### ALL SAINTS', EDMONTON, AND ST. JOHN, SOUTH HACKNEY, PARISH CHURCHES.

On Thursday, 25th October last, Dr. Tristram, Q.C., Chancellor of London Diocese, presided over a sitting of the Consistory Court in St. Paul's Cathedral. Two faculties were granted by the Court. One is for restoring and converting into a side chapel the southern transept, now occupied by the organ and for the vestry, of St. John of Jerusalem parish church, South Hackney, at an estimated expense of 1,900*l*. This fine church, designed by Mr. E. C. Hakewell, architect, was consecrated in 1848. The other faculty relates to All Saints' parish church, Edmonton. There, under the directions of Mr. Scott, architect, it is proposed to increase the accommodation by 200 seats, and to make in addition sundry minor alterations. This will be effected by enlarging the aisle along its southern side—an extension which it is contended will result in a great improvement to the fabric from an architectural point of view. This church was built in the middle of the fifteenth century, and consisted of a chancel, nave, northern aisle, and a square, embattled tower, after the type that is not infrequent in that part of the county. In 1772 the body and chancel of the church were encased with brick, and some of the window tracery was replaced with woodwork. Partly through the munificence of a late vicar, the Rev. R. E. Copleston, in 1871 choir stalls, a new font, and a stone reredos were set up, in supplement to a restoration of the interior five years before. The monument to John Kerton, to which a reference was made in the Court, was erected in 1471; it rests beneath a depressed Gothic arch, ornamented with foliage. This monument will be transferred to a corresponding position on the new wall. Weever speaks of some early fifteenth century monuments or tombs that are now lost or destroyed. There are, however, brasses to John Asplyn and Geoffrey A-kew, and Elizabeth, who was widow to the one and wife to the other, also to Nicholas and Edward Boone (or Bohun), early sixteenth century, with one of 1616 to Edward Nowell and his family. The eastern and two southern windows were inserted to the memory of Mr. E. T. Busk and Mr. R. E. Copleston, respectively. About twenty-two years ago a new tenor bell, weighing 11 cwt., was added to the peal.

Edmonton Manor, the Adelmeton of Domesday Survey, belonged *temp.* Edward the Confessor to Asgar, stallarius or Master of the Horse to the king, and was valued at 40*l*. The Conqueror bestowed it, together with Eia Manor and other possessions held *ex officio* upon Geoffrey de Mandeville, or Magnaville, whose descendant was created by King Stephen, Earl of Essex, and, having been killed at Bur-

well, 1148, was re-interred in the (second) Temple, London, where his effigy may be seen in the Round Church. His shield, charged with a sun, is supposed to furnish the earliest instance of armorial bearings so displayed. Until 1370 the manor was vested in the Lords Saye of Berling, from whom it passed to the Charltons. On the attainder, 1st Henry VII., of Sir Richard Charlton, the property escheated to the Crown, and eventually became part of the marriage settlement of our Queens Henrietta Maria and Katharine of Braganza. The vicarage, which dates from 1335, had long been appropriated to the monks at Hurley. At the Dissolution Henry VIII. granted it to Thomas, Lord Audley, who surrendered it again to his Sovereign in 1544. The following year the King gave it to the present patrons, the Dean and Chapter of St. Paul's. One Peter Fanelour, a landholder in Edmonton, and co-founder of the chapel dedicated to St. Mary Magdalen and All Saints, which formerly stood by the Guildhall, built a little chapel next to the parish church, and founded therein a chantry for two priests. He died in 1361. The registers record the baptism, July 5, 1686, of Elizabeth, who by marriage to Charles Stuart, Earl of Lennox, was mother of the unfortunate Arabella Stuart; and the burial, on June 25, 1737, of the Lord-Treasurer Harley's widow. Archbishop Tillotson, when Dean of St. Paul's, often sojourned here, at the parsonage-house, whence he removed his collection of exotics to Lambeth. Amongst other worthies should be mentioned Charles Lamb, who spent the two closing years of his life at "Mr. Walden's, Church - street, Edmonton." — Bay Cottage; Keats, who served his time under Hammond, the surgeon, of Church-street, where he first read Chapman's Homer and Spenser, and composed his earliest volume of poems; and Cowper. Lamb's grave is on the right-hand side of the path leading from the south-western corner of the churchyard: his friend Gray, the translator of Dante, wrote the epitaph. In 1847, Mary Lamb was buried in her brother's grave. Some of the roadside inn-herabouts are commemorated in a little book dedicated to John Olley, of Madely Manor, co. Stafford, and printed for Rich. Marriott, in S. Dunstan's Churchyard, Fleet-street, 1653, which concludes with an invocation of "the blessing of Saint Peter's Master . . . upon all that hate contentions, and love quietness, and virtue, and Angling." One of these is the "Bell," at Edmonton,—a favourite resort of Lamb, by the bye,—which, dating from the end of the sixteenth century, and as rebuilt in 1878, and by its new sign of the Bell and Johnny Gilpin, perpetuates the story of the most humorous ballad that ever was written in our English tongue. On September 8 last we announced that Mr. T. Milbourn, architect, would furnish a design for a mural monument, in the church, in memory of Cowper and Lamb.

### Illustrations.

#### CHASTLETON HOUSE, OXFORDSHIRE.

THIS interesting house, picturesquely situated on the borders of Oxfordshire, about four miles from Moreton-in-Marsh station, was built by one Walter Jones, originally of Grismont, in Monmouthshire, in the reign of King James I. He purchased the estate from Robert Catesby, of Gunpowder Plot renown.

It is built of local stone, and the roofs are covered with green slates, all weathered to a beautiful colour.

The house is full of interesting objects,—tapestries, cabinets, furniture, &c.; and almost of the rooms are panelled and have elaborate plaster ceilings.

The illustration shows one of the sides, with the staircase tower, and was exhibited in this year's Royal Academy Exhibition.

E. G. D.

#### DESIGNS FOR WALL DECORATION.

THESE designs are reproduced from large cartoons designed by Mr. J. Aldam Heaton, and which were exhibited in the Architectural Room at the last Royal Academy Exhibition, when we drew special attention to the fine and original quality of design which they displayed.

Mr. Heaton says: "The larger of the two

is a wall panel, introducing acanthus, oak, and privet: oil painting on roughish canvas, backed with paper-mâché; one of a series of foliage subjects for the sides of the saloon of an Atlantic steamer. Before painting, the canvas has been silvered and lacquered down to a quiet, bronzy-gold colour, forming a tolerably neutral middle tint, which appears continually in small fragments, thereby considerably reducing the amount of painting in small details, and rendering the decoration of a large surface by one hand possible. The acanthus and privet are in varied greens, inclining to gold and russet, the oak in blues and greys, on a ground of deepish greeny-blue. The foreground follows the style of the finer kinds of mediæval tapestry.

The smaller illustration constitutes a frieze to the former, of the same materials and treatment (but somewhat gayer), only that it is bordered by a simple and severe frame of leaf and scroll, all in transparent gold-coloured lacquers, while the centre of the composition is in solid oil colours, green, blue, yellow, and delicate flesh tints.

The much too great depth of the frieze, in relation to the wall panel below it, was the result of constructional necessities."

[We may observe that it is only since the lithograph was prepared that we have received from Mr. Heaton the information that the long narrow panel was in reality the frieze to the other portion of the design. There was no hint of this in the Academy catalogue. Had we been aware of that, we should have had the two lithographed in their proper relative positions as wall-space and frieze, even at the cost of some further reduction in scale. The designs being sent to us as two independent pieces of work, they were arranged on the page with the view of getting the detail to as large a scale as the space would admit of.]

#### STABLES, NORTHLEACH.

THESE stables have been recently erected from the design of Mr. John Belcher, local stones being used for the walling, dressings, and roofs.

The *Builder* critique on this year's Royal Academy Exhibition having remarked upon a Roman-Doric feeling in the Colonnade, it will be interesting to state that the remains of Roman buildings at Chedworth, in the neighbourhood, furnished the motif for their details.

The drawing was hung in the Architectural room at the last Royal Academy Exhibition.

#### "HERNBROOK," HORSHAM.

THIS house has been built for Mr. W. Barclay Sandeman. It stands in an elevated position on the road from Horsham to Brighton, and is surrounded with a small park.

The materials are red brick, with dressings of Box-ground Bath stone, the roofs being covered with dark red tiles. The interior is plainly finished, its chief feature being the entrance and staircase-hall, of which the ceiling is ornamentally panelled, and will be decorated in colour; while the window is filled with stained glass made by Messrs. Moore & Son, of Southampton-row.

At a short distance from the house are the stables, constructed of rough local stone, with the upper parts half-timbered. The entrances are from the St. Leonard's-road, where there is a rustic lodge, and from the Brighton-road, where the proposed lodge has not yet been erected. The whole has been executed from the designs and under the superintendence of Mr. Charles Barry, F.S.A. The contractor was Mr. Mitchell of Dulwich, and the cost of house and stables has been 5,720*l*. The clerk of works was Mr. Hogan, of Dulwich. Mr. Cannon, of London-road, has executed the gas and warming apparatus, and the hot-water arrangements.

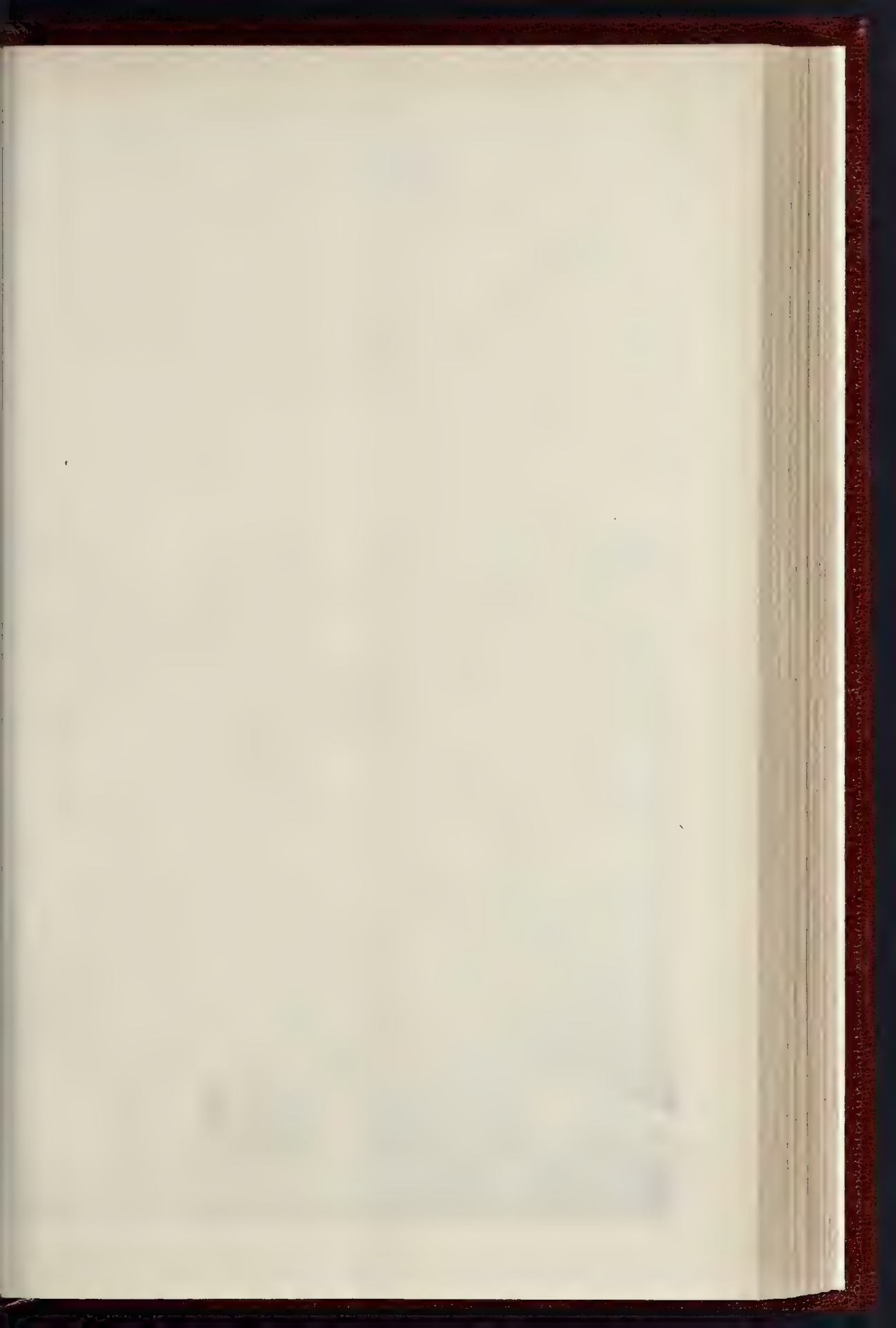
#### COTTAGE HOSPITAL, RUABON.

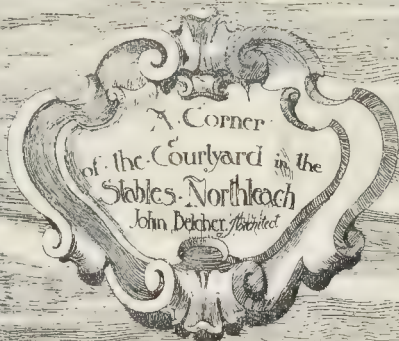
THIS hospital (of which we gave a full description in the *Builder* for January 21st of this year (p. 51), has been built, with special view to meeting "accident cases," by Sir Watkins Williams Wynn, Bart., in memory of his late uncle, the sixth baronet. It has been erected from the designs of Mr. W. H. Spaul, architect, Oswestry, and is situated on the left side of the road leading to Rhoslanerchrugog, in close proximity to the village, and in the centre of a large colliery and manufacturing district.

The lower part of the building is faced with red bricks and terra-cotta; the upper part is

\* In the *Athenæum* of November 30, 1833, was printed the very last Essay of Elia; on December 27, 1834, he died.





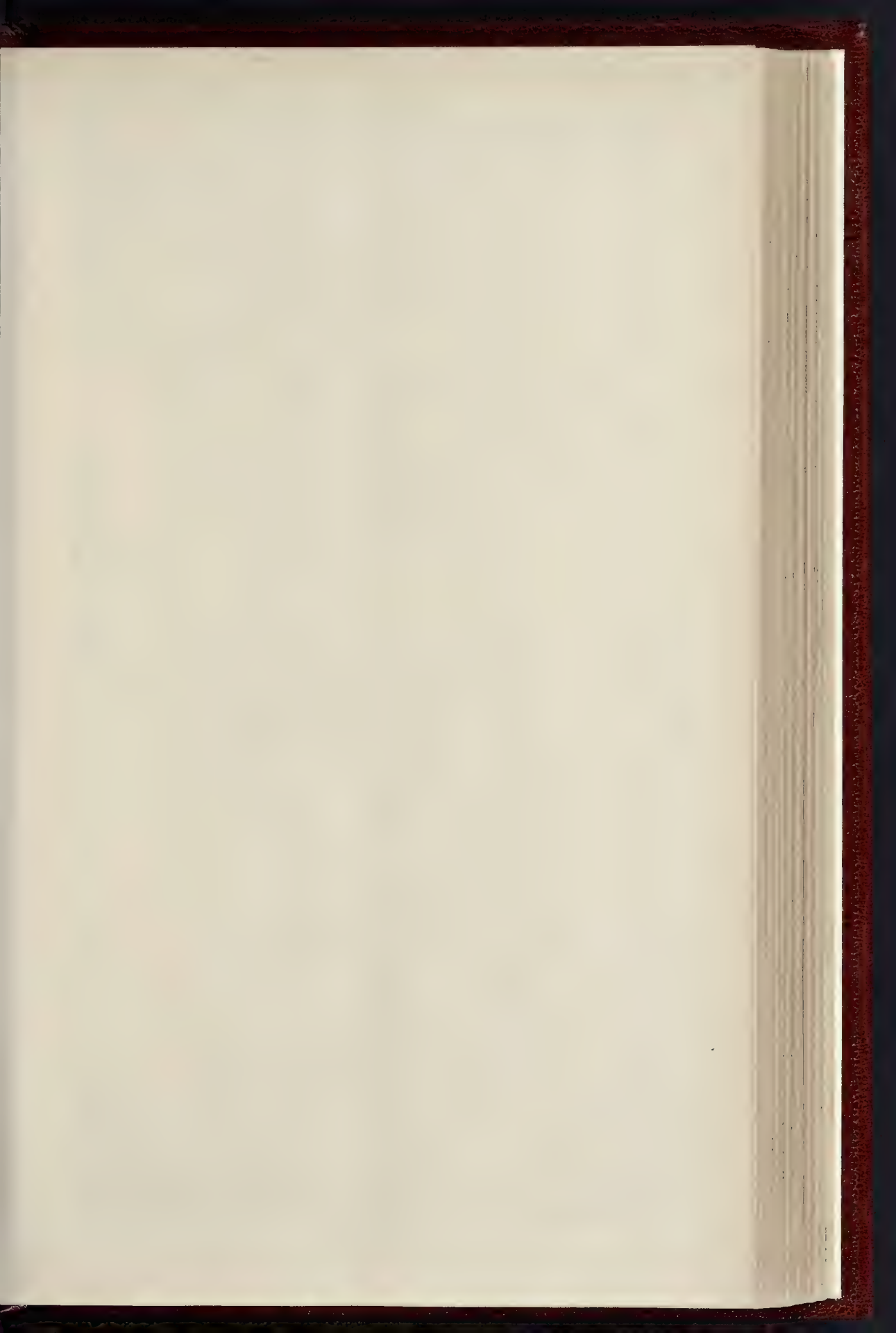












THE BUILDER, NOVEMBER 10, 1888.

"Hornbrook," Horsham  
The Residence of W.B. Sandeman Esq.  
Charles Barry. Architect.



Plan of Ground Floor.





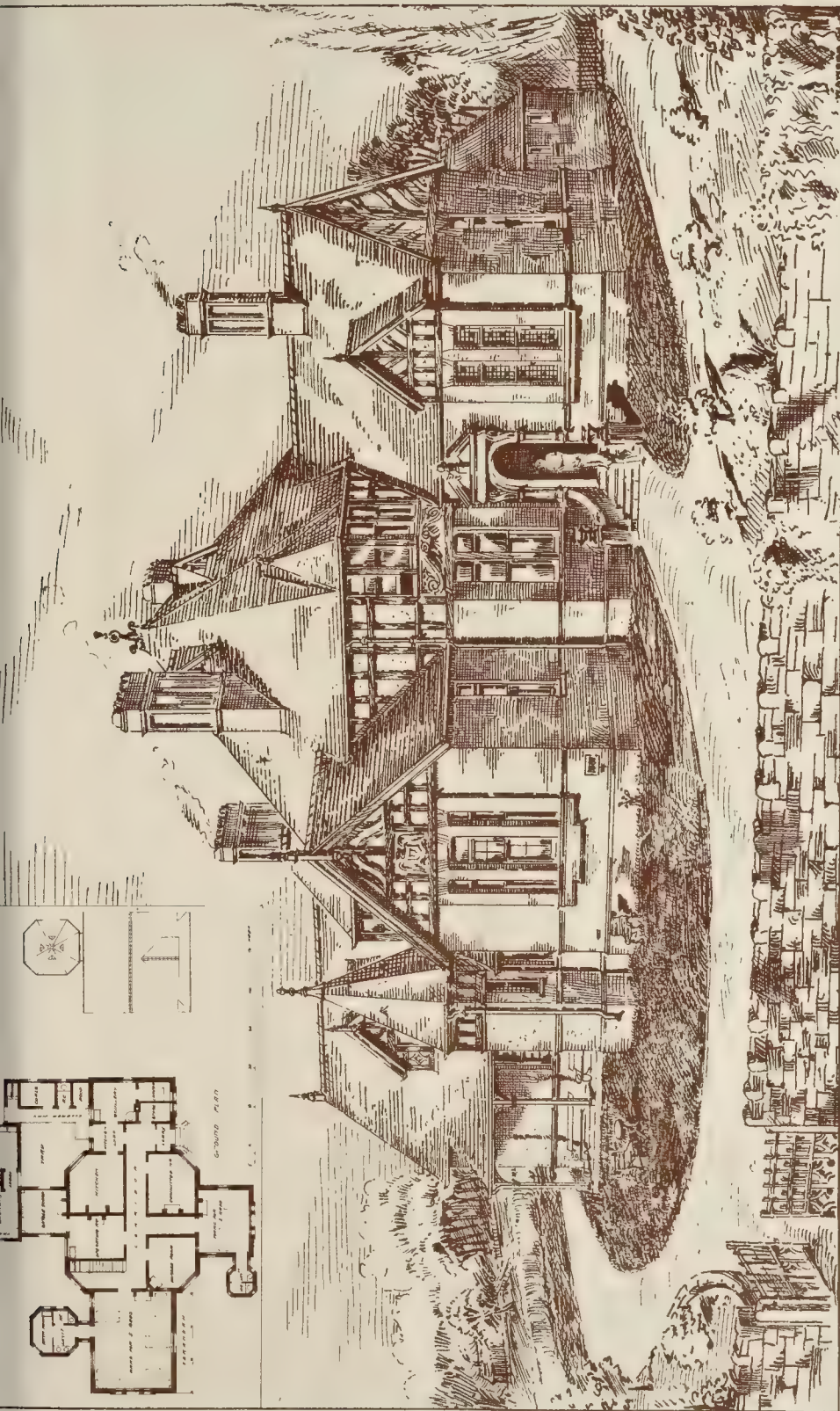
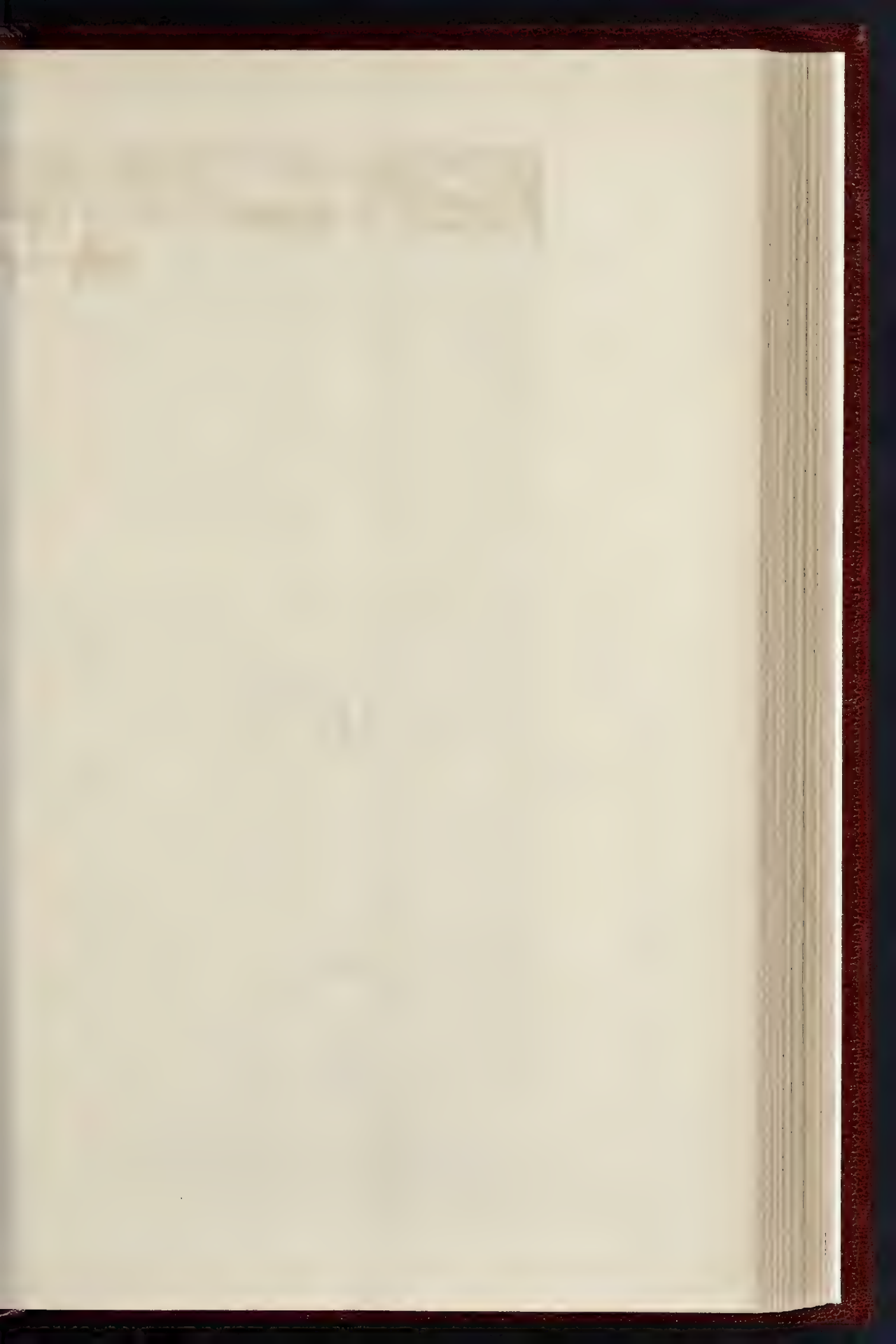


PHOTO LITHO SPASKE & CO 22, MARTIN LANE, LONDON, E.C.

COTTAGE HOSPITAL, RUABON.—MR. W. H. SPAULL, ARCHITECT.







THE BUILDER, NOVEMBER 10, 1898



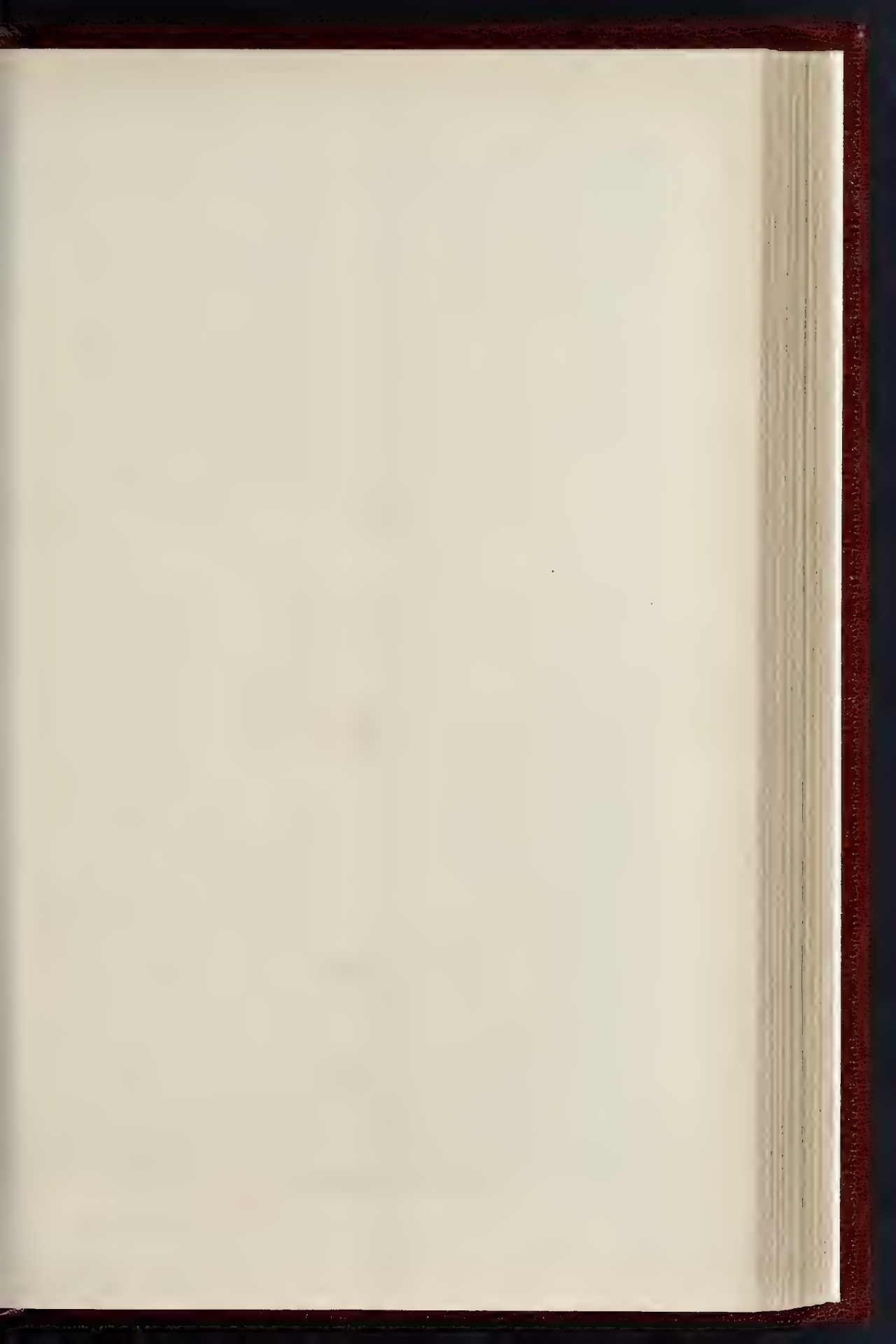


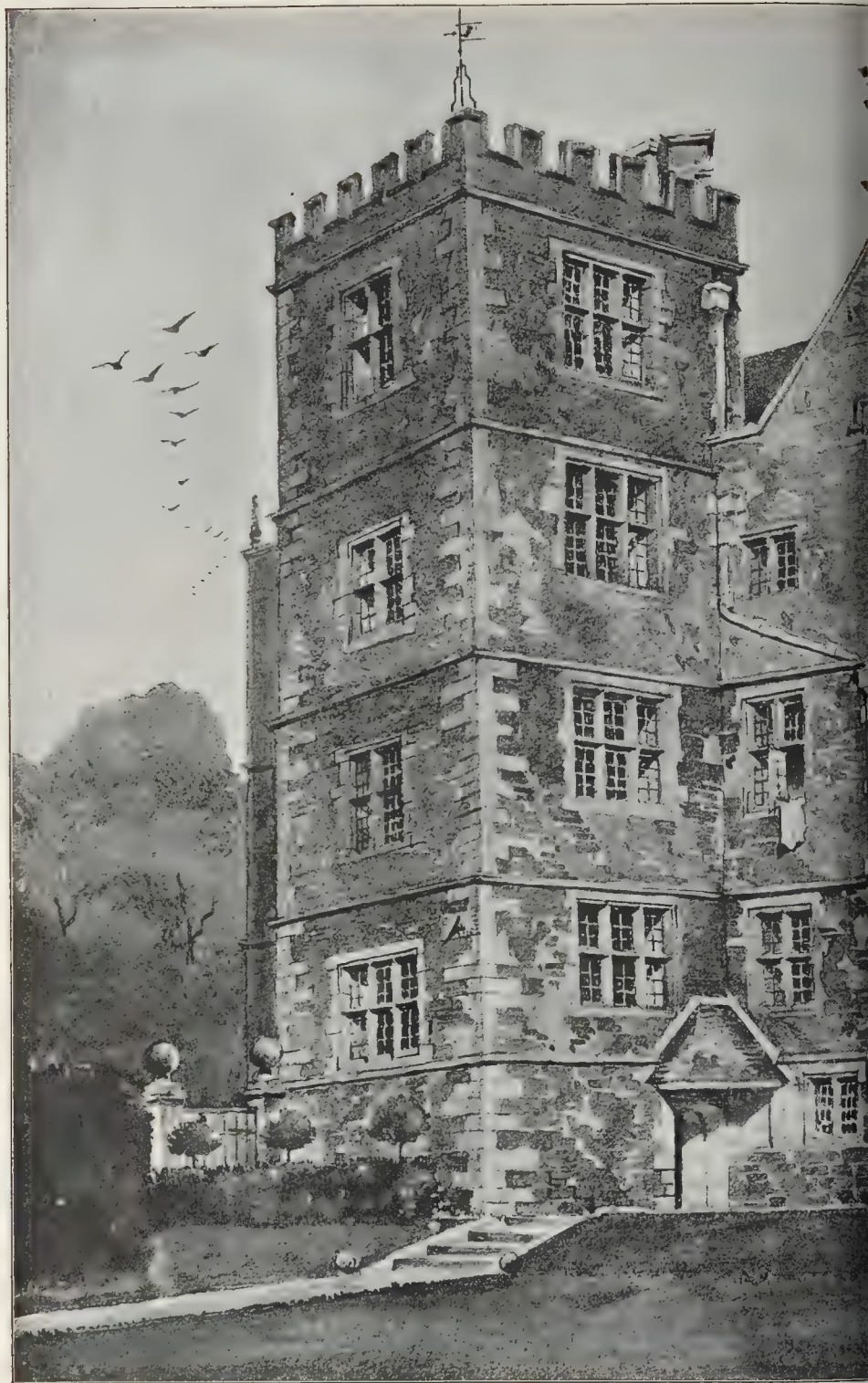


DECORATIVE PANELS.—By MR. J. ALDAM HEATON.









CHASTLETON MANOR HOUSE, OX





FROM A DRAWING BY MR. E. GUY DAWBER.

The Phototype Co., 25, Strand, London.





umbered, the oak used for the purpose been grown on the Wynnstay estate, and are covered with red tiles. The wards, lavatories, corridors, &c., are lined with glazed bricks from the works of J. C. Edwards, of Ruabon, who also supplies the terra-cotta. It will be noticed that the rooms, lavatories, &c., are properly out into the wards by cross-ventilated passages. We informed that the ventilating-pipes and the drains are carried up out of sight, the outlets through the centres of the pipes on the octagon roofs. The bricks were supplied by Mr. Bowers, the heating-apparatus by Messrs. E. Thomas & Co.

The cost of the building, exclusive of land and furniture, was 2,030*l*. The cost of furnishing the hospital was also defrayed by Sir John, with the exception of the two-bed-rooms for which Mr. J. C. Edwards, of the Terraces, Ruabon, made special request to be allowed to provide the furniture.

The hospital was originated by the Dowager Duchess of Williams Wynn to meet a sudden emergency caused by a terrible colliery explosion, and was carried on for many years in the name of the property of the late Sir Watkin Williams Wynn.

# ROYAL INSTITUTE OF BRITISH ARCHITECTS.

An opening meeting of this Institute for the present session took place on Monday evening 19, Conduit-street, Mr. Alfred Waterhouse, (President), in the chair.

## The By-Laws under the New Charter.

Mr. J. Macvicar Anderson (Hon. Sec.) said:—I desire to make a very brief statement in regard to the By-Laws. It will be in the recollection of the members of the Institute that at the annual meeting held last May, the By-Laws, which had been printed as amended, were presented, in accordance with the Supplementary Charter, to be submitted with as little delay as possible, for the approval of Her Majesty's Privy Council. No time was lost in forwarding the By-Laws, and passing them into the hands of our solicitors, Messrs. Markby Stewart & Co., who also lost no time in passing them into the hands of the Privy Council. In fact, that the members of the Institute may be in the exact position of the matter, I will read the letters received from the Privy Council. On the 30th of June our solicitors received the following letter:—

"Privy Council Office, Whitehall, June 30, 1888. Gentlemen,—I am directed by the Lord President of the Council to acknowledge the receipt of your letter of the 24th inst. in respect to the proposed By-Laws of the Royal Institute of British Architects, and I am instructed to inform you that His Lordship is advised that there are no objections to the By-Laws as defective."

No provision is made in the Charter of Association in accordance with Clause 4 of the Charter of 1887, in the passing of such examination required by the By-Laws now before the Privy Council. It is observed that by Clause 46 of the By-Laws the provisions of competition for prizes, &c., are left to be decided by the Council of the Royal Institute, whereas in the Charter of 1887, Sub-sections (a) and (b) require these matters to be dealt with in the By-Laws.

The Lord President is advised that the By-Laws ought to be approved by the Privy Council until they are supported by others which supply the deficiencies mentioned, and I am to request that you will lay this letter before the Council of the Royal Institute in order that the necessary alterations may be made in the By-Laws.—I am, Gentlemen, your obedient servant, (Signed) C. L. PERL.

That letter, after being submitted to the Council, Messrs. Markby Stewart & Co. replied:—

87, Coleman-street, London, E.C.

July 6, 1888.

"Your letter of the 31st ult. has been submitted to the Council of the Royal Institute of British Architects, and we are desirous, in reply, to call attention to Sections 3 and 4 of the Charter, which provide not only that persons desirous to be admitted as Associates are from the date of the Charter to be admitted after the expiration of five years from the date of the Charter pass certain examinations, and it was considered necessary, therefore, to do more in the By-Laws than to leave the appointment of examiners in the hands of the Council, but, in view of the amendments proposed, however, to the view expressed in your letter, the 2nd of the By-Laws has been amended by making it a condition that, in applying to be admitted, a candidate should declare that he has passed the examination required by the provisions of the Charter, and an addition has been made to Clause 41, under which the Council are bound to appoint a Board of Examiners in Architecture, the purpose of conducting the examinations required by the Charter to be passed by persons seeking admission as Associates or Fellows."

In reference to Clause 46 of the By-Laws, it is impossible to describe in detail the precise terms of any amendment, which naturally vary from year to year. Therefore, the Council have been accustomed to issue a time-table programme, which we enclose two copies, and a new clause has now been substituted for Clause 46 in the original print, which we trust will be con-

sidered to be a sufficient compliance with Clause 34, sub-section G, of the Charter.—We are, Sir, your most obedient servant, (Signed) MARKBY STEWART & CO., The Clerk of the Privy Council.

To that the following letter was received, dated August 16:—

"Council Office, August 16, 1888."

GENTLEMEN,—With reference to your letter of the 6th ult., and to previous correspondence on the subject of the proposed By-Laws of the Royal Institute of British Architects, I am directed by the Lords of the Council to inform you that the amended draft By-Laws do not sufficiently meet the objections referred to in my letter of June 30 last. As to the admission of Associates, the By-Laws should, in our opinion, be amended, define—at any rate by general description the character of the Examination which Associates have to pass, and as to the terms and conditions of competition for prizes, &c., the By-Laws should embody such of them as do not necessarily, or usually, vary from year to year.

The above omissions must be supplied before their Lordships can approve the By-Laws.—I am, Gentlemen, your obedient servant, (Signed) C. L. PERL.

Messrs. Markby Stewart & Co., 87, Coleman-street, E.C.

Drafts of amended By-Laws meeting the views of the Privy Council have already been prepared, and are now in the hands of our solicitors for consideration, and will, as soon as possible, be submitted to the Privy Council. We hope, although in legal matters any hope, of course, must be qualified, that before long we shall be able to submit the revised By-Laws.

## Action of the Council under By-Law 23.

The President said: It is my duty, in accordance with By-Law 24, to announce that by a resolution of the Council, unanimously passed on the 7th July, pursuant to By-Law 23, Mr. James Ebenezer Saunders, Fellow, has ceased to be a member of the Royal Institute of British Architects (loud applause).

The President then delivered his inaugural address, which we print in extenso elsewhere.

Mr. Ewan Christian, in moving a vote of thanks to the President, said:—I am sorry that the task, or rather the pleasure, of rising to ask that you will accord your most hearty thanks to our President, for the very interesting and practical address with which he has favoured us this evening, has not fallen to abler hands. Mr. Waterhouse has traversed a very large and wide field, and I do not propose to follow him through all his wanderings, but I hope to be able to say a word or two upon some of the points on which he has touched. First of all, he has congratulated us on the completion of the work which was commenced during my presidency—that of revising the Charter, and completing the By-Laws by which it had to be accompanied. That, happily, is now within a short time, I hope, of being completely consummated. I am sure we must all rejoice in that, because it has been a source of great trouble and anxiety to get this properly and wisely completed, and I believe now we are within sight of it. Mr. Waterhouse has spoken upon a great variety of subjects. What he said upon the subject of Registration I most heartily agree with—indeed, I think most of us will concur with him when he says that education is what we want, and not "registration." I quite agree with him also in his advice to the student, that he should prepare for the Institute Examination, so as to pass it creditably and without resorting to cram. We want well-educated men as members of our body, and we hope we shall see a great many more of them as time goes on. There is one point on which the President has spoken very strongly, and I think very rightly,—that is upon the work of laying out our cities. He has commented very properly upon the dreadful work that has been done in destroying Nash's line in the laying out of Regent-street (applause). Nash may not have been a very superior architect, so far as his buildings were concerned, but he certainly had a genius for laying out a city, and Regent's Park and the line of Regent-street are, I think, works that even we in these days may recognise as being very excellent indeed (applause). His work was tampered with in the first instance, when they destroyed the colonnade of the Quadrant, which was an excellent and characteristic feature of his design; but in destroying the Circus a very much greater evil has been committed. Surely something might have been done to avoid the destruction of the excellent arrangement which he first laid down (applause). It is now, I fear, hopelessly lost; how it is to be remedied I, for my part, cannot see; I am afraid it cannot be done. Then the President has rightly spoken of the necessity of space for public buildings, and he has told you what was done in Brussels, of the magnificent position the great building for the law courts

recently erected there occupies, and how very finely the whole scheme has been laid out. We have not the space in London that they have in Brussels, and therefore we cannot do things on the same magnificent scale; but we can, and I hope we always shall, try to do what we can to prevent the light and air and the blue sky being shut out of our streets. I really cannot help rejoicing that the scheme for the Admiralty and War Offices was abandoned (applause), because, so long as I live, at any rate, I shall have the delight of seeing the sky over the tops of the buildings on that side of Whitehall, which would have been completely shut out if those buildings had been carried up, and anything more dull than the result would have been I cannot imagine. The President has also referred to the new Courts of Justice as illustrating what he means. Now, I think that that building has been most cruelly treated (hear, hear). Street's design was a very fine one, whatever people may say about it (cheers). But it was absolutely ruined because they would not give him a few more feet of ground, although now they have plenty to spare on the western side, now to be laid out as a garden; but if they had allowed Street the space he desired, it would have made his building a totally different thing, and given plenty of space for corridors. It would have then been perfect, and one of the most magnificent structures of modern times. As it is, it is really cruelly destroyed. There have been some very absurd remarks in the public press of late about it, but we architects know how shamefully Street was cramped with reference to the building. If there had been a proper care for the laying out of public buildings at the time that design was decided upon, probably things would have been different. The next point upon which the President touched was the losses we have sustained during the past year. I cannot forget that when I came here to the opening meeting of last session, I saw sitting there Edmund Woodhouse, I saw our then President, and I myself sat next to Godwin, Tanson, Godwin, and myself, were old friends—now two of them are gone, and I remain. Woodhouse, our genial friend, has left us, and I shall always regret the loss we have sustained, also my enthusiastic old friend, Joseph Clarke; but the President was probably not aware that he it was who was the practical founder of that valuable stimulant to young men, the Pugin Studentship. The President has referred to country as well as to town buildings, and I think there are few people who know what an immense deal has been done in England during the past few years in the construction of private residences. Dotted about the country, in almost all parts, these buildings are to be found, so that this Victorian age has been quite as prolific, or even more so, than the time of Queen Elizabeth, in the erection of fine houses and buildings, which will be of interest to those who follow us. And I have no doubt that the Homes of England will be as famous in the future as they have been in the past. I agree cordially with the President as to the importance of the architect, when designing buildings in the country, being capable also of designing their surroundings. Any one who has travelled in Yorkshire, and visited the magnificent house of Castle Howard, cannot fail to see that the architect of that building was a consummate artist, as well as an architect in stone and mortar, because nothing more excellent can be seen anywhere than the way in which he has laid out the grand avenues, and all the surroundings. To any one who has the opportunity of building a country-house, there is nothing more delightful than imagining how the thing is to be completed, with all the surroundings and beautiful gardens, and unless men are able to see that from the commencement of the work, I think their work is very likely to be a failure. The President has spoken of the biographies of architects. The biography of George Edmund Street is a book which ought to be in every student's hands. I hope there will be another edition of it, and combined with the letter-press there should be a few facsimiles of the wonderful sketches Street was in the habit of making. I had the great privilege and satisfaction of travelling with Street two months before his death. I was with him and Pearson in Savoy when we went a trip to the Lake de Bourget, and visited a convent. We had an hour to stay there, and Pearson and I strolled about; but Street immediately seized upon a very fine doorway on the south side of the church, and before the steamer departed the whole thing was in his note-book—a complete drawing of the doorway, with every detail that



could be wanted for its execution in the hands of the workmen. A more rapid and wonderful piece of work I have never seen done. The "Life of Street" ought to be in the hands of all who are diligent to study, as showing how that great man arrived at the success he undoubtedly attained (applause). The President has spoken of another man—Henry Hobson Richardson, and has remarked that in America things are done in a different way to what they are done here. American architects are hampered by the unfortunate circumstances of their country—nothing being ever permanent in the way of administration. Every four years there is a general upset, and architects are changed just as other employes are changed. Therefore some of the buildings in the United States give very strong evidence of the deleterious effects of that operation. When I arrived at Boston I well remember how dumbfounded I was when I saw the wonderful tower of Trinity Church. We build a few towers in England, too, but we never go to such dimensions as are illustrated in that work, and Mr. Richardson has produced the most powerful example of a modern tower that I have ever seen. But what struck me in America was that the country was in a very interesting condition as regards art. There was evidently a giant at work, but he seemed hardly to know how to use his tools. He was gradually arriving at a result which would one day be a grand one indeed, and the death of Mr. Richardson was, to my mind, a national calamity for America. It takes a long time to train or produce an artist like that man, though I hope his pupils may be architects of genius. The President has spoken strongly and well, and in words which I am sure we must all emphatically endorse, on the paramount importance of guarding unsullied the honour of our profession, words not one whit too strong or that will bear in any way to be softened, and which it behoves every one of us carefully to ponder. Mr. Christian concluded by moving a vote of thanks.

Mr. T. J. Flookton (President of the Sheffield Society of Architects and Surveyors): Gentlemen,—I have been honoured, and somewhat surprised, by the request that I would second the proposition of a vote of thanks to our President for his very able address. I have very great pleasure in doing so, although my notions of modesty would not permit my attempting to make a speech, even were I able to, at so short notice on this my first appearance before you. The President has evidently devoted a great deal of time and ability to the address which we have had so much pleasure in listening to (applause). That such efforts require both time and trouble I am in a position to speak personally. Having in a very humble way recently had to compose a Presidential address myself, I have found it not merely required trouble, but attended with labour, and also with a good deal of anxiety, anxiety that one might say everything that should be said on the subject under consideration, anxiety that one should say nothing that one would afterwards wish had not been said, and, at the same time, anxiety to so far interest one's audience as to occupy their attention and prevent their going to sleep. Our President has fulfilled all these conditions most ably to-night. He has said everything in a most exhaustive manner on the subjects he has introduced to our notice. I think he has said nothing with which any of us will be at all likely to disagree, and he has certainly kept our interest maintained from the beginning to the end. I have, therefore, the very greatest pleasure in seconding the vote which has been proposed by Mr. Christian, that our hearty thanks should be given to the President for his most able and interesting address (applause).

The resolution was then put and carried by acclamation.

The President: You have heard so many words from me this evening that I shall content myself by thanking you most sincerely for the very kind reception you have given me, and the very close attention with which you have listened to the words I have had to read to you. I was particularly gratified to hear from the lips of Mr. Christian the manner in which he supplemented my remarks about the Law Courts, with which I entirely agree, and the further remarks he made about our late lamented President, Mr. Street. He also remarked that he had visited Boston and America, an advantage which I have not had. And I was particularly gratified to hear what he had to say about Mr. Richardson, and his remarks about there having been a giant at work not knowing exactly how to use his tools. That is a fine description, cer-

tainly; and I have no doubt it is true. Gentlemen, I am extremely obliged to you for having listened to me so attentively (applause).

The President then announced that the next meeting would take place on November 19, when there would be a ballot for the election of members, and when business questions would be discussed.

The proceedings then terminated.

#### "ELIZABETH AND VICTORIA."\*

IN traversing this beautiful country of England with a view to examine its architectural remains, the two objects that we look for wherever we go are the Gothic church and the Elizabethan manor-house. I am not altogether sure, indeed, that with many of us the Elizabethan manor-house does not attract more attention than the Gothic church. How far this would have pleased or shocked our fathers in the profession it would be useless to inquire. Fashion sways our clients as it sways the hatter's customers. These will accept a wider or a narrower brim even as they are persuaded thereto by the young man behind the counter, and as his choice agrees with what they can recollect seeing in fashionable places. Those will accept a pointed or a round arch according to the dictum of their architect, so long as it is not at variance with what their neighbours are accepting on all sides. But each and all desire the cheapest of its kind, and are highly gratified at obtaining much show for little money.

Twenty or thirty years ago the pointed arch and its accompanying features were the only acceptable wares. Accordingly, to look at ancient work less ancient than the thirteenth century was a grievous waste of time, not to say the mark of a dissolute mind. Now, however, the partakers of our annual excursion, though quite prepared to accord its full archaeological value to the thirteenth century, seek their inspiration for the nineteenth from work dating about half-way between the two,—namely, from the times of Elizabeth and James. The reason of this is not far to seek. We are gradually awakening to the fact that forms and features which satisfied the equations that the Middle Ages had to solve, do not satisfy those presented to us five or six centuries later. In ecclesiastical architecture, it is true, those forms and features are still not out of place. But ecclesiastical architecture is demanded by a select few. Domestic architecture is sought for by the million; and in the domestic architecture of Elizabeth and James is to be found much that offers clues and hints towards solving the problems of to-day. Apart from this practical reason for the change of taste, there is what we may call the historical reason. The sixteenth century marks sharply and decisively a complete change in men's habits of thought. With the Cecils and the Hattons, and the innumerable builders of mansions under Elizabeth, we have much in common; their ways are, many of them, our ways, and their thoughts our thoughts. But what have you and I to do with the celestial hierarchy that adorns the west front of Wells Cathedral, or with St. Edmund, king and martyr, whose severed head was miraculously joined to his body after death, and whose corpse thus supernaturally "restored" was the sole and sufficient cause of the erection of the enormous Abbey at Bury St. Edmunds? Or what with the sacred thorn that for centuries was the mainstay and support of the magnificent Abbey of Glastonbury? You and I, at any rate, are architects, and we love to know of these things, and some of us from loving to know of them come to love the things themselves, and even perhaps to feel towards the celestial hierarchy, and St. Edmund king and martyr, and the sacred thorn, some of the reverence which filled the minds of men six centuries ago. But then we are architects, and our sympathies are largely with the past. How is it with the pushing men of business with whom the world is peopled? Like Gallo, they care for none of these things.

But they do care for comfortable homes, for handsome houses, for labour-saving appliances, and for all the conveniences which modern progress affords; and from their architects they expect, first of all, these material things, and they sympathise but little with any desire that their architects may have to work in some particular style which prevailed when the fortress still left its trace upon the dwelling-house, when

security was preferred to light and cleanliness, and when the quantity of the meat was of more importance than the quality of the cooking or the convenience in cooking it.

It is not surprising, therefore, that the taste for Gothic houses was short-lived. Their pointed windows, however successful on the outside, were failures on the inside, obstructing the light where it was most wanted, and putting the upholsterer at his wit's end how to fix his blinds and curtains. Their wide-open fires were liable to smoke, were costly to feed and warmed the chimneys where the family did not sit, in preference to the rooms where they did. The stained and varnished woodwork and the indecorous display of naked construction produced a feeling of chilliness and discomfort. After all, the most blameless life will not bear to have the whole of its motives exposed; the most beautiful houses are better for a covering of flesh. And so the desire for bare Gothic declined, and attention was diverted, with better prospect of success, to the great house-building epoch of Elizabeth.

That period and the one in which we ourselves live are unrivalled for the amount of building which marks them. The building trade at the present time is one of the largest interests in the country. The ever-increasing numbers of our own Association are themselves a proof of the amount of work that is being done in bricks and mortar. The innumerable illustrations which appear week by week in our excellent building journals, faintly suggest the amount and the variety of the work undertaken by the architects of Victoria's time. But we have to go back to Elizabeth's days to find anything like the same amount of general activity, though even then it was but as a placid lake compared to the stormy ocean. There was, however, hardly a squire then who did not either rebuild his house or materially modify it. While most of the nobles and nearly all the high functionaries of the Court erected mansions which to this day are, such as remain to us, models of stately design and magnificent taste.

To name only a few: there was the great Lord Burghley, who built Burghley House and Theobalds; there was Sir Christopher Hatton, who built Holdenby and enlarged Kirby; the Earl of Dorset, Lord High Treasurer, who built Buckhurst; the Earl of Suffolk, another Lord Treasurer, who built Audley End; Lord Robert Cecil, who built Hatfield; Sir Thomas Heneage, Treasurer of the Queen's Chamber, who lived at Copt Hall; Sir Percival Hart, Chief Sewer and Knight Harbinger to Queen Elizabeth; Sir Thos. Lake; and Sir George Coppin, Clerk of the Crown to James I.

Besides these, who were in some way attached to the Court, and probably made the money there which enabled them to erect such noble houses—which were always, in their letters to each other, built solely in order to entertain her Majesty in a suitable manner; besides these there were great noblemen like the Duke of Buckingham, who built Burley-on-the-Hill, and wealthy gentlemen like Sir Francis Willoughby, who built Wollaton, and Sir Walter Covent, who built Slaught Place, in Sussex. These are only a few of the great building-owners of the time, only a small selection from the army of clients who were willing to spend half their fortunes in obtaining houses with all the stately apartments and the conveniences which the change of manners then rendered necessary. These men it was who inaugurated a new era in architecture, whose habits led them to require a new type of dwelling, and whose tastes demanded magnificence and display. They are sharply marked off from their predecessors, who were content to lurk in dark places, if sufficiently strong; and it is because they were men of so much wider ideas that we find it worth while to study their houses closely to-day.

But though Elizabeth's days are more suitable sources of inspiration to us than the earlier times of unalloyed Gothic, far be it from me to advocate blind copyism for the architect, or to recommend a client to build himself a house strictly after the fashion of those built—as Evelyn phrased it of Kirby in the middle of the seventeenth century—*à la moderne*. Not at all. Mere copyism is the resource of the feeble; but, on the other hand, there is every reason why we should profit by the ideas, the successes, and more especially the failures of those who have gone before us. And for that reason it seems to me that an examination of the work of Elizabeth's time in the light of these days of Victoria will not be out of place.

\* A paper by Mr. J. A. Gatch, F.R.I.B.A., read before the Architectural Association on the 2nd inst.



Now, to begin with, of all the thirteen houses which have just been named, how many have come down to us? Only Burghley and Kirby, Audley End, and Hatfield and Wollaton. Hebbalds is gone completely, and so are the houses of Sir Thomas Henegge, Sir Percival Hart, Sir Thomas Lake, and Sir George Coppin. Holdenby little but the memory remains. Langham Place is reduced to a few columns and arches, and the grass-grown foundations of an extensive walls. Burley-on-the-Hill has been replaced by a great Palladian structure, so far as we know, they have not been destroyed by fire, nor by any hostile agency, but they have come to decay because no one was found to reserve them. And what of those which have arrived? Kirby has been deserted for more comfortable houses; Audley End has been shorn of two-thirds of its extent; Burghley and Hatfield and Wollaton retain little of their original arrangement beyond the shell. The wellings which suited our forefathers of Elizabeth's time do not suit us in Victoria's.

It is the same wherever we go. If we find in Elizabethan house occupied, either some radical alteration has been made, to the detriment of the architectural harmony, or else the inhabitants put up with manifold inconveniences rather than disturb the ancient order of things, which has served many generations of their predecessors. One of the most obvious drawbacks of the Elizabethan plan is the number of thoroughfare rooms. Burghley House has been helped by building a corridor round the courtyard. At Canons Ashby, for want of some such addition, you have, from a considerable number of bedrooms, the choice of two ways to get to the breakfast-room. One is through the drawing-room, and down the main staircase; the other is down a subsidiary staircase and across the open courtyard. At Kirby the same difficulty was present, and before that house can be inhabited again that difficulty must be surmounted. A corridor here would be ruin to the beauty of the courtyard; while to roof the courtyard in, and to exclude the sunshine from laying amid the badges of the Staffords and be long lines of swelling fruit, and to prevent the shadows from creeping across the grey and olden walls, marking from day to day "Time's hieish progress to eternity," this might make Kirby habitable, but it would be a Kirby with half its poetry gone.

The fact is these large houses were built for entertaining guests rather than as homes for their owners. The long rows of small rooms arranged round a courtyard were separate groups of apartments, self-contained, and designed to accommodate visitors and their servants, in the same way that each undergraduate has his separate establishment at college. One of these groups is designed to include a bedroom, a reception-room, a servant's room, and a room for "wood, coal, and privy." There were certain larger rooms where the guests assembled together, such as the hall or the gallery, and to such these the courtyard probably had to be reversed, just as to-day it has to be traversed by undergraduates for the sacred ceremony of lining. But in Elizabeth's days people seem to have cared less for the weather than we do; though, as rain would wet as much then as it does now, the gay gallants must have grumbled exposing their finery to a sharp shower; and if they did get damp there would have been amid the brilliant assembly much the same kind of stuffy odour as pervades in our own times an ambitious on a wet day.

In the present day our habits are different. We do not entertain on the same sumptuous scale; a separate suite of rooms for every guest is not expected; people like to get to their beds under cover, and would as soon thank us to put them up at a neighbouring inn, as to ask them to walk across a wet court in evening dress. We find in these days that it tends to be easier and better work of the house to get all the bedrooms upstairs, and the reception-rooms on the ground floor. There would, therefore, be no room for Lord Burghley's commendation of Holdenby, in that it had so fine an ascent from the hall to the great chamber. One of the governing features of an Elizabethan house we entirely omit from our designs—the long gallery. Almost all the old ceremonial has gone. Along with the gorgeous dresses went the stately manners, and the necessity for the stage whereon to display stately manners and gorgeous dresses. We look for large and lofty rooms now, because in themselves they are handsome and imposing, and not because they are picturesque backgrounds to our noble selves. We seek for comfort, not pageantry.

And for that reason we no longer hanker after brilliant processions from the hall to the great chamber, winding up the broad staircase, where rows of quaint animals in all the attenuation and lissomeness of thorough heraldic "condition" gaze proudly over the heads of the guests, unmindful of all but the sacred family arms which they support. Not at all: we care for nothing of this; we prefer going up in a lift.

But the smaller houses, such as were designed for Sir George Coppin, or Sir Percival Hart, or Sir Thomas Lake, in London, were much more compact, and were tolerably convenient. But it is obvious even in them that expense was but little studied. If there was less money to spend, the house was made smaller, but no pains seem to have been taken to contrive economical plans. All those ancient buildings must have cubed out at a terrible figure. Everybody concerned seems to have agreed that one of the first things to be secured was a handsome building. The idea of getting the house comfortable inside, and leaving the outside to take care of itself, with strict orders to spend no money on show, which is a not infrequent instruction to us, does not seem to have occurred to clients in those days. They were quite content to let the architect have his way, and he went on the principle of making his clients adapt their wants to his architecture, rather than that of adapting his architecture to their wants. There is no doubt that his method was the easiest, and produced the most stately buildings, but our way is the best, and it is for us to solve the problem how to combine attention to all modern requirements with a handling of materials that shall produce fine architecture. Our task is by far the more difficult, and the time given to do it is generally of the shortest; so let not these things be forgotten when critics abuse the architecture of the nineteenth century. The method of the Elizabethan architect was simple enough. He ascertained approximately the accommodation required by his client; he found that he wanted a certain type of house, and away he went. The plan, perhaps, worked out so that there was a room or two more than the number asked for. A very simple matter; he just labelled them "waste," and the client had to pay for their erection; and the client's grandchildren, probably, paid for their pulling down.

Symmetry was another great solvent of those days: it simplified matters wonderfully, since it was accepted by all alike as indispensable. There was no need to adjust the sizes of the rooms to their various purposes, or to study the best positions for the windows and fireplaces. A start was made probably with the hall and the adjacent rooms; the position of the kitchen in relation to these was usually carefully considered, provision was made for the longest possible gallery, and the rest was left to take care of itself. If it did not happen to work out quite happily for the best arrangement of some of the rooms, if the doors and windows quarrelled with the fireplace, or if the ladder found itself possessed of a great bay window, nobody minded, for symmetry demanded it, and this excuse satisfied everybody. In the present day it is otherwise. Not only do we have to be very careful how we plan our buildings,—so that not only our client and his wife are satisfied, but also his ox and his ass, and everything that is his,—but as every foot of material is reckoned up beforehand, we have to be particularly not to put in too many of them. Our predecessors had a freer hand; the masses of masonry in some of their chimneys would almost suffice to concrete the whole of the foundations; and yet amid those masses are generally to be found very delightful cupboards, the absence of which is the despair of the modern housewife. The wasteful planning of those times, at all events, carried some compensation with it.

Then, again, the great question of sanitation had not yet arisen. To-day we are slaves of the soil-pipe. That unsightly talisman has to be hidden as far as may be; and in the effort to hide it, we make the whole house revolve round the small apartment which it safeguards. Not so the architect of Elizabeth's days. He was lavish in his supply of such apartments. Generally each suite of rooms had one. If it could conveniently be placed next to an outer wall, it was. If not, any other place was suitable. Sometimes it led directly out of the winter parlour, sometimes it was in a passage, sometimes in the middle of the house. Sometimes, but not often, it projected from the side in a manner almost modern, but, as a rule, the situations chosen for it are truly astonishing;

and it is a matter of wonder whether our ancestors had any noses to offend, or any blood to poison.

It has already been pointed out that particular care was bestowed upon the position of the kitchen; indeed, this is done to the exclusion of the consideration whether the servants overlooked the precincts devoted more especially to the family. This is a factor which played no part in designing a house in Elizabeth's days. A room was a room, no matter what its destination. Its windows ranged with the others, and were as good; so that, to look at the house from the outside, it appeared equally imposing from all points of view. This does not suit modern views at all. They demand that the servants' department shall be quite separate from the family's; and, as money must be saved somewhere, it better be in the servants' offices, which need not be nearly so expensively finished outside as the rest of the house. At once, therefore, we have a back to the house; a large part of the building which has to be subordinated to the rest, which must be differently treated. This necessity alone is a factor which widely divides our ways from those of Elizabeth's time.

So, too, in the treatment of the elevation. In the old days they thought nothing of putting in numberless sham windows. The most picturesque side of Cobham Hall is riddled with sham windows, put there for effect merely, glazed to resemble their *bona-fide* neighbours, but built up at the back from the time of their erection. At Kirby, too, on one side of the entrance, are the noble windows of the lofty hall, 20 ft. high or more; on the other are a like number of noble windows, 20 ft. high or more, but a close inspection shows that a floor goes right across the middle of them. In so far as their noble height is concerned they are shams. We cannot do that now, nor anything like it. Nor need we be anxious to make our chimneys look like coupled columns, nor to set great heraldic creatures climbing about the stonework, nor to do many other of the things which our ancestors did, but which, being done, we do not wish to see undone. These things, from which our sober judgement revolts, we can avoid, and yet find much to help us in the manner in which stone and brick and wood were wrought in those days.

But who was responsible for these buildings? That is a question not yet satisfactorily settled. That there was anything like the autocratic and all-accomplished architect of our times I do not believe, who to-day designs his client a sideboard, to-morrow arranges his drains, and next week commences a stained-glass window to his memory. Things were much simpler in those days, and the various branches of the business of housebuilding were under the special care of separate men who may—indeed must—have been amenable to a central authority, but who certainly did not look to him for every morsel of design and instruction.

In the building of Cobham Hall, for instance, we find that one R. Williams, who was probably the clerk of the works, writes to Lord Cobham as follows:—"We have bargained with Giles de Whitt for making two chimney-pieces for the two chambers next to your new chapel. He demands £65 for both. I will not give above £50, and he will accept it in the end rather than fail." And later we find the same correspondent urging his lordship to "resolve what and how much you are pleased to have done by Giles de Whitt, either upon some new chimney-piece, or upon my lord your father's tomb, that the poor man have some work to get wherewithal to maintain and sustain himself." No doubt Giles de Whitt designed these chimney-pieces as well as made them; and, to judge from the different character of design in stone and plaster and wood, no doubt the masons designed their own carving, and the plasterers their own ceilings, and the joiners their own panelling; for the hand was not yet divorced from the mind. To read the letters relating to the building of Hatfield gives one the same impression. The only agents who appear are the clerk of the works and the foremen, or the surveyors who are sent down to ascertain in what state the buildings are, and why the cost so much exceeds the estimate. There is no architect mentioned, nor any one to whom all matters are referred, as they are in our days. The correspondence is carried on between the clerk of the works and the building owner, from whom instructions issue direct. Sometimes, however, a surveyor is employed to superintend, as was the case at Holdenby, for on one occa-



sion when Lord Burghley was going thither and Sir Christopher Hatton was unable to receive him in person, the latter wrote a letter of welcome to his "singular good Lord, the Lord High Treasurer of England, at Holdenby," in which he begged his guest to give "his opinion to the Surveyor of such lacks and faults as should appear to him in this rude building," which he averred was built "in direct observation" of Lord Burghley's house at Theobalds, and which he hoped might become really like it by means of Lord Burghley's corrections. How would an eminent architect in the present day like to have a high and mighty friend of his client's come down for the purpose of dictating alterations and corrections in a design practically completed? Perhaps, however, the request was merely a compliment on the part of Sir Christopher; at any rate Lord Burghley was charmed with Holdenby, praised its facade, the ascent from the hall to the great chamber, and the largeness and lightness of the rooms. As for its being an imitation of Theobalds, truly the latter place he liked as his own, but it was only a foil to Holdenby. There was a certain amount of truth in this, for Holdenby was considerably larger, and was an improvement in many respects upon the older building. But they were both fine palaces. Holdenby, indeed, was a vast and stately edifice, suitable to an age which delighted in magnificent displays; and Sir Thomas Heneage declared it would hold the pre-eminence of all the modern houses he had known or heard of in England.

Most of the large houses of the time were thus superintended by a surveyor, or architect, as we should now call him,—of whom the best known is John Thorpe. But his functions were far different from those that we have to fulfil. The hundreds of drawings that now go to the erection of any considerable building were wholly unknown. Plans and elevations were supplied, but, so far as can be gathered, the details were left to be arranged on the spot. A very much simpler method than ours, but one not compatible with the system of contracting which demands that everything must be foreseen and tabulated, from a staircase to a chamfer stop, and that every variation from the pencil-and-paper arrangement shall be duly noted and valued. Gentlemen, the existence of the quantity-surveyor is a marvellous tribute to the ingenuity of the human mind; and he is also one of the most noticeable barriers that divide the times of Elizabeth from those of Victoria.

But, gentlemen, it is not for us to deplore the fact that times have changed. They always have and they always will. It is for us to recognise that they have changed, and that we are expected to solve our own problems in our own way, instead of vainly seeking problems that may be solved by the old methods. The difficulties of Elizabeth's days are not exactly those of ours. The way in which the men of Elizabeth's days overcame their difficulties cannot be exactly our way. But we can recognise how well those difficulties were met, and if we are content to study the two things together, the questions and the answers, and to refrain from playing at cross-questions and crooked answers, we shall find great help in answering our own questions in our turn.

We have dwelt somewhat on the shortcomings of the architecture of Elizabeth's days to-night, but it must not, therefore, be supposed that we are blind to its excellences. The plans may be crude, but they are simple and stately in disposition, and the wants they had to meet were also crude. The elevations are to us always effective, partly from association but partly also from the quality of the means used. The mulioned windows give scale to the mass, the bay windows afford a simple method of avoiding monotony, the long lines of string-courses and the pierced parapets impart breadth to the design, while the gables and the tall chimneys produce a picturesque sky-line in a natural and easy manner. There is, undoubtedly, much in the detail of the time that is ill-considered and coarse, but we live in the light of the Victorian age, with all knowledge accessible and with better means for correcting our judgments and improving our tastes than were ever yet offered to mankind; and we may, if we will, find much in the architecture of Elizabeth which, purged of its coarseness and refined in the crucible of our minds, may go far to ennoble the architecture of Victoria.

[Of the discussion which followed, a report is in type, but we are obliged by want of space to hold it over until next week.]

#### SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

At the opening meeting of this Society for the present session, held on the 30th ult., Mr. T. J. Flockton, the President, delivered an address, in the course of which he remarked that the full attendance of members at the opening of the second session of the Society showed no falling off in zeal and energy, and augured well for its future. The first session had been a success; the sound policy "of walking before running" had answered in this, as in other undertakings, and good work had been done towards the objects specified in their rules,—professional advancement and the promotion of professional culture. Valuable papers by Mr. J. W. Cannon, of Leeds, on "The Legal Registration of Architects," and by Mr. J. Murgatroyd, of Manchester, on "Association and Federation," had been read and carefully discussed, and the action taken by the Society re the Bill introduced in Parliament for the legal registration of Architects had a direct and important bearing on it. There had been a difference of opinion amongst them on the merits and details of the Bill—and the mode of its promotion—but it was unanimously resolved, after final consideration, that legal registration of the profession was desirable. The acceptance of the invitation of the Royal Institute of British Architects for the alliance of the Society with the Institute was matter for congratulation, showing the desire of the Institute to establish a broader basis for a cordial, intimate, and practicable union with provincial societies than had hitherto existed. In his own case the modified form of declaration had removed all difficulty, and he had at once applied for, and had had conferred, the honour of election as a Fellow. The courteous action of the Improvement Committee of the Town Council of Sheffield in affording the Society an opportunity of carefully discussing the proposed new by-laws for new streets and buildings in the Borough of Sheffield,—and the manner in which their suggestions, given after much attention had been devoted to the matter, had been received—and especially the request that the Society should communicate with the Local Government Board, were proofs that the Society was making its influence felt. He had been asked to accompany the chairman of the Sheffield Highway Committee with the town clerk, and their member, Mr. W. C. Fenton, to the office of the Local Government Board in London to further discuss the by-laws. Finally, the draft by-laws had been referred back to the committee for further revision—and this had since been done—the alterations referring especially to open spaces to be left in front and rear of new property in central town sites. In the advancement of professional education, especially amongst the junior members, valuable papers had been contributed by Mr. C. Hadfield on the "Position and Attainments of the English Architect," by Professor T. Roger Smith on "Architectural Education," and by Mr. J. D. Sedding on "English Architecture." Looking to the coming session, papers on technical subjects would be read,—in November, "On a Proposed Improvement in Theatre-planning," by Mr. E. J. Farver; in December, by Mr. H. W. Brewer, on "Some of the Smaller Municipal Buildings of Germany"; in January, by Mr. J. M. Inery, on "Estimating"; in March, by Mr. W. Emden, "Theatres"; and probably by Mr. H. Stannus and others. On the whole, the prospects of their Society were cheering, and if the members all pulled together and did not allow interest and exertion to relax, there was no doubt of its capacity for doing useful work, and of the prospect of its becoming a permanent and very beneficial institution; and he was sure he should not appeal to them in vain to keep up interest in the work they had so well begun. He then proceeded to review the state of architectural practice in Sheffield half a century ago—about the time of his entering the profession. In those days, work had to be carried on with few of the aids now available. The Royal Institute of British Architects had held its first meeting the previous year. There were no professional journals with their valuable illustrations and information; no photographs; lithography was in its infancy; facilities for study were limited, and travelling far in search of existing buildings difficult and costly. Nowadays all this was changed. But young men must remember that the men who preceded them were determined to acquire knowledge in spite of every difficulty, and if they wished to succeed nowadays,

they must avail themselves of every means of acquiring and storing information; and thus make themselves competent architects, ready to seize on their opportunity as it occurred. Their Honorary Secretary and himself had got together a few drawings of architectural work in Sheffield from about the year 1831 to 1847, which hung on the walls. They included drawings by his father, the late W. Flockton, the late M. E. Hadfield, and the late J. G. Weightman, and also some of his own work. Speaking of the changes in architectural fashion, he observed that the so-called fashionable Queen Anne style which had sprung up of late years, however beautiful and picturesque it might be when properly treated, was in different hands likely to degenerate into trumpery and common-place work. On the motion of the Vice-President, Mr. F. Fowler, a hearty vote of thanks was awarded the President for his address.

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

At the first meeting of Session 1888-89 of this Association, held on the 1st inst., the President (Professor G. Baldwin-Brown) delivered the opening address, taking as his subject "Some Aspects of the Work of an Architectural Association." After referring to the constitution of the Association, he asked what it could do for the benefit of the various classes of members composing it? The Architectural Hall should, he said, be made, first, a pledge of the solidarity of the architectural profession; secondly, a place of instruction, and still better of stimulus, for the younger members; thirdly, a centre of artistic influence that might affect the public at large. The architect, often to his sorrow, had to deal, not only with artistic matters, but with complicated matters of business; he had to avoid the danger of sinking the artist in the man of affairs. The Muses, if the nineteenth century had not driven them away, should be appointed doorkeepers of the Architectural Hall, and should suffer no business cares, no sense of professional rivalry, to follow those who entered to share in the work of the Association. On the important questions of more formal union among Scottish architects, on architectural federation, and the like, it became him, as a layman, to speak with reserve, but it was not satisfactory that there should be no body constituted for Scotland in general to represent architecture in questions, such as those of professional practice, which might from time to time arise. He desired to speak with all loyalty of the Institute in London,—an Institute, it must be remembered, of British architects,—and a good solution might be found through some process of affiliation. In any case, they should strive for more solidarity among the members of the profession in Scotland. In the country generally there seemed too many local jealousies, too little united effort. What was the use of a lively national sentiment if it did not result in hearty common action for the general good? The Association this year was doing something towards this end by interchange of papers with other Scottish societies, meetings in common, and the like. With regard to the educational work of the Association, there were the work-classes, which had been carried on since 1883. It was proposed now to endeavour to systematise the classes so as to make them a fit preparation for the Examination of the Royal Institute of British Architects. The great difficulty was the want of any endowment. There was a good work being done that might be greatly extended if a little help was afforded. Edinburgh was famous as an educational centre, but it would be a great advantage if some benevolent despot could lay hands on all the educational apparatus of the city, and redistribute the endowments and the work, so as to avoid the overlapping and rivalry which were now so prevalent. Then, again, more united effort, less jealousy and narrowness, were needed. But the younger members of the Association might usefully start some educational work of their own. Why should not a club or society for design and decoration be formed? It would need a name and a sort of patron saint, as St. Luke was patron saint of the artistic guilds of the Middle Ages. What name could be better than that of Robert Adam, who was as great in ornamental design as in monumental architecture? After sketching the possible work of such a society, the President concluded by reminding the younger



members that though they were practical students and not dilettanti, they must remember that the dilettanti had something to teach them. He dealt with art because he took a pleasure in so doing, and all artistic work should be done in the spirit of enjoyment.

# MANCHESTER ARCHITECTURAL ASSOCIATION.

THE opening meeting of the fourteenth session of this Association was held on Tuesday, the 6th inst., and was largely attended. One new member was elected, and fourteen were nominated.

The President, Mr. A. H. Davies Colley, A.R.I.B.A., in his address congratulated the members on the work of the past year, and said that the Association was in a better position, he believed, than they had ever attained to, and was able to exercise a greater influence in every way. Their thanks were due to the late Mr. P. Anson and to the Free Libraries Committee for the handsome addition of architectural books to the reference library, and he hoped that members would show their appreciation of them. The formation of classes for quantity surveying and figure drawing, and the revival of the sketch-book were referred to as most desirable and with their increased number more easily to be carried on. The President directed special attention to the work of the Competitions Committee of the Royal Institute of British Architects and to the meagre response it had met with. In July last out of 118 practising architects only 47 had signed the memorial. After some remarks upon federation and the new connexion of the Association with the Royal Institute of British Architects, he recommended members to qualify as Associates, and those already Associates or Fellows to use the titles on all reasonable occasions. In conclusion, he suggested that an evening might be devoted to the discussion of the artistic improvement and control of the city, which had been debated at a recent meeting elsewhere.

A vote of thanks to the President was proposed by Mr. L. Booth, F.R.I.B.A., seconded by Mr. Hodgson, and supported by Messrs. Mee, Chadwick, and F. B. Smith.

# THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

THIS is the title given by Miss Harrison to a course of five lectures, begun on November 2, in the lecture-theatre of the South Kensington Museum. The first lecture was exclusively concerned with the discoveries made (1) round the Erechtheion; (2) south of the Parthenon. The former, Miss Harrison thinks, go to prove that the goddess Athene may claim a much greater portion of her own hill from the earliest times than has hitherto been assigned to her. The foundations of a great pre-historic palace, similar to that of Tiryns, in all probability the *Ερεχθίδας πυκνός δῆμος* (Hom. Odys. vii., 81), have been laid bare, and close by, in part passing right under the Caryatic porch, and nearly parallel to the Parthenon, the foundations of a temple which, according to Dr. Dörpfeld, was the Temple of Athene herself, existing before the Persian war. Dismissing the vexed question of whether or no it was rebuilt after the Persian war, this temple is, from the point of view of the early cults, of supreme importance. It brings into proper relation Athene and Erechtheus. She is the relation Athene and Erechtheus. She is the Polias, the presiding goddess of the citadel, with her temple built close to the ancient palace of the kings; he is the kingly fostering, who probably had a small subordinate shrine in the neighbourhood of the great temple. The series of female statues found in 1885 by the north portico of the Erechtheion are, from the absence of characterising attributes, considered by Miss Harrison to be, not goddesses, but priestesses of Athene. This view is supported by a slab of similar character and technique to that of the statues. It represents the goddess, distinctly characterised by her helmet, with attendant worshippers, who have nothing distinctive. The number of these statues points to the all-important fact that this portion of the Akropolis was regarded as a precinct sacred to Athene. Close by, moreover, several bronze statues of Athene, four of the "Promachos" type, have been found. These bronzes are specially interesting, for three reasons:—(1)

The Athene "Parthenos" was directly derived from the "Promachos" type; (2) they are of the type with which the Athenians associated the Palladium of Troy; (3) they, no doubt, point to an early open-air worship of Athene "Promachos" on the Akropolis, and to an earlier statue of the goddess before the great bronze statue of Pheidias. An amphora (B.F.), in the Berlin Museum, shows such an open-air worship; the goddess in her warlike attitude stands behind her altar, towards which advance in procession a priestess, an aged man, and two youths leading a heifer. This vase helps to give a lively picture of the early supremacy of Athene and her worship. Turning to the excavations S.E. of the Parthenon, one of the most important discoveries noticed and illustrated was that of an archaic head in poros stone, probably representing Herakles. The description of the brilliant colouring,—hair and beard bright blue, eyes emerald green,—did not fail to raise a smile among the audience. An illustration of unique interest showed part of the foundations of the older Parthenon begun by Kimon, over which Perikles built his greater Parthenon. These foundations were laid bare by the excavators, but the ground has now been filled up again, and they are no longer visible. They were described in the letter from Athens in our issue of August 25 of this year. A last illustration was one of the latest discoveries; a relief of Athene looking down in earnest thought at a stele, the latter symbolic perhaps of a treaty between Athens and some other city. The theory that the goddess has consciously been given an expression of sadness was strongly repudiated by Miss Harrison as incompatible with the spirit of the archaic period to which the stele belongs.

# THE INTERNATIONAL TRADE CONGRESS.

A FRENCH correspondent of the *Times*, in its issue of the 6th, gives the following information as to the views and intentions of some of the French trade bodies in regard to the policy which the French delegates should uphold at the International Trade Congress:—

"The Parisian delegates have prepared collective reports and held a very interesting meeting, at which they decided the line of policy to pursue with respect to the four principal questions to be submitted to the Congress. Each trade sent in its special suggestions and report, and one and all agreed that it was necessary to reconstitute an international working men's association. The coopers thought that this should be done without official link or central federal committee, but merely by correspondence and mutual understanding. The blacksmiths insisted that it was the political element which caused the old International to fall to pieces. The Paris compositors wanted foreign workmen to be admitted into trade unions, and remarked that just as picketing is sometimes rendered illegal, so it ought to be illegal for employers to boycott trade unionists. The Commercial Employes' Society are in favour of political and economical labour parties being created in each country and federated internationally; while the representative of the book trades objected to the introduction of politics in trade organisations. In reply, the Cabinet-makers maintained that it was not politics but personal vanity and selfishness that caused divisions. The Coopers' delegate asserted that his trade had tried every method. They had organised a guild, then a co-operative society, a benefit society, and finally a trade union. None of these succeeded. There was no vitality in them. But when they established a trade union with a political economical programme, the workmen rallied round it, and their society is now a success. The Boller-makers' delegate pointed out that the English trade unions excluded politics, and, therefore, though strong and prosperous, they had only created an aristocracy of workmen, and outside their ranks there were 6,000,000 toilers helpless and unprotected. Trade unions had not merely to watch the interests of their members, but to compel the Government to pass laws benefiting the working classes as a whole. Consequently the Parisian delegation decided to demand the formation of an independent labour party in each country, having a political and economical programme, and being united internationally by a federal link.

The sculptors' alone did not approve of State

\* So in the *Times* correspondent's communication. Probably architectural carvers are meant.—Ed.

interference to fix the day's work to eight hours. The French delegates, apart from advocating an international eight hours' Bill, will argue in favour of laws suppressing the sweating system, of fixing a minimum rate of wages, of establishing public services, such as municipal bakeries and factories for the manufacture of the necessities of life. Further, they will insist that trade unions should be so organised as to take over directly from the State or the municipality the work that has to be done for the community, and this without the intervention of any individual capitalist, contractor, sweater, or middleman."

# OBITUARY.

**Mr. John Griffith.**—The death lately took place, at the advanced age of ninety-two years (less a few weeks), of Mr. John Griffith, late of 6, Hanover-terrace, Regent's Park, and formerly of 16, Finsbury-place South. He was elected a Fellow of the Institute of British Architects in 1842. The *City Press* states that for nearly half-a-century he practised his profession. As Chairman of the Kensal Green Cemetery Company, he was responsible for the laying-out of the grounds. He was also Surveyor to Coleman-street Ward for many years, and built several houses now standing in Coleman-street. Probate was taken on the 26th ult., his property amounting to over 170,000*l*.

**Mr. John Cowell.**—Mr. John Cowell, A.R.I.B.A., Canterbury, died a few days since, of typhoid fever. A local paper says that Mr. Cowell was a pupil of the former City Surveyor of Canterbury, the late Mr. J. G. Hall. He subsequently commenced practice on his own account, and laterly has been in partnership with Mr. Bromley, of Folkestone. Mr. Cowell, who was but thirty-two years of age, was employed in connexion with the erection of the premises in St. George's-street, Canterbury, occupied by the East Kent and Canterbury Conservative Club, and also had charge of the restoration of Stodmarsh Church, now only just completed.

# NEW CHURCH AT BARMOUTH.

STR.—Unsatisfactory and absurd invitations to compete are not unfrequently issued, but the committee which proposes to itself to obtain drawings for a church at Barmouth (the invitation is in your issue of the 27th ult.) has almost outdone previous efforts.

"It is proposed to build a church," "to seat 800 to 1,000 people." There is all the information given,—premiums, referees, the hopes the selected man might have to be employed as architect,—these things are treated with magnificent contempt.

I wish the committee joy out of their effort, and much satisfaction will they get out of the sort of architect who would condescend to enter into such a competition!

ONE WHO DOES NOT COMPETE.

# SOCIETY JOURNALS ON ARCHITECTURE.

STR.—In *Vanity Fair* this week there is a remarkable puff of a firm of architects, whose "treatment of Mr. Leopold de Rothschild's hunting-box near Leighton Buzzard" is elaborately commended.

Unfortunately, the writer of this paragraph advertisement has lavished his praise on the wrong people.

The house mentioned was designed by my late uncle, Mr. George Devey, as were also the additions which have been erected since his death.

When the Society papers forsake scandal and give information about architecture, it seems that they do not also abandon their usual love of fictitious facts.

H. DESVEY BROWNE.

# WARMING VILLAGE CHURCHES.

STR.—Our village church is a small one. It is at present warmed by means of a Gurney stove, which is not sufficient to protect the new organ from damp. We wish to adopt a system of hot-water heating, but have no convenient space inside the church to place the furnace and boiler; besides which we wish to avoid the eyesore of a smoking chimney. Can any of your correspondents help us by suggesting the simplest and best way of constructing the furnace? Has there been any efficient and economical application of mineral as a substitution for a coal or coke furnace?

Nov. 6, 1888.

AN OLD SUBSCRIBER

# Birmingham Architectural Association

The opening conversations of this Association for the present session, 1888-89, will be held on Wednesday next, the 14th inst.



## The Student's Column.

## ARTIFICIAL STONES.—XIX.

*Stones made with the Assistance of Alkaline Silicates (continued).*

**A**N American artificial stone, which, when well burned, gives good results, is formed of a mixture of from 2 to 10 per cent. of litharge, mixed with ground quartz sand. The harder the stones are required to be the greater the proportion of litharge employed. The mixture moistened with water glass, thoroughly incorporated, pressed firmly into moulds, dried, and burnt.

Another American patent stone is designed to resist the greatest degree of frost, and to be quite impervious to water. The composition is intricate, and the resulting compound must be comparatively costly, containing, as it does, litharge, oxide of iron, soapstone, carbonate of magnesia, and sulphate of lime mixed with water, then kneaded up with a solution of silicate of soda and alum. These ingredients being well mixed, dry sand and cement are added in the proportion of eight parts of the former to 1 of the latter. The articles being well pressed in moulds, should be kept moistened with water for at least six days. Very good stone can be produced by the admixture of a solution of alkaline silicate to Portland cement.

Batterbury & Brown's "Improved Silicious Compound" is one of sand, oxides of manganese and iron, kaolin, gypsum, sulphur, silicate of soda, resin, and a little petroleum; these ingredients are heated together, and cast into moulds.

E. Robbins prepared artificial stone by mixing sand, gravel, stone dust, glass, clay, marl, lime, or any similar substance, with soluble silicates; to the mixture is added a solution of chloride of calcium freshly prepared, by adding dilute hydrochloric acid to chalk.

An effective combination is one of sand 1 to 5 parts; slaked lime, 1 part; cement, 1 part, with enough water to form a creamy mass. When moulded and dried, the stone is immersed in a solution of water-glass for several days, and again dried.

O'Friel's stone, manufactured in New York, and stated to be unaffected by great cold, is composed of a mixture of 55 parts of lime, 8 parts of alumina, 24 parts of fine sand or silica, 3 parts of caustic potash or soda, and 10 parts of soluble silicate; the mass being well mixed, can be used in this form as cement, or mixed with its own weight of clean sand to form good artificial stones.

Ordway, another American patentee, made artificial stone by moulding and heating for two hours at a red heat a mixture of 30 parts of quartz and 1 part of litharge made into a dough, with 10 parts of water-glass, which if desired, may be suitably coloured.

Roettger's artificial marble (1874, pat. 3,008) is produced by using a white cement obtained by calcining Iceland and Calc spar. The cement is moulded with water and put to soak in a bath containing silicates of soda or potash and soluble silica; after some time it is withdrawn, dried, burnt again, reduced to the necessary fineness, and is then mixed with water to form the imitative marble.

Meyer four years later utilised natural fluorides, such as fluor spar, cryolite, &c.; the minerals were powdered, mixed with soluble glass, formed into stones, &c., of desired form and allowed to dry.

A patent which obtained provisional protection only in 1878, proposed to form artificial stone from chalk by mixing it with hydraulic lime, flints, shingle, and silicate of soda.

In 1881 R. H. Stone patented a stone, containing fine sand, silicious clay, lime, and water; the mixture was rammed into moulds and allowed to set for from three to ten days, and then covered with a layer of alkaline silicate, to prevent what the inventor terms, with evident ignorance of the meaning of the word, "carbonisation," which is doubtless intended to refer to the absorption of carbonic acid gas by the lime, and not to the miraculous conversion of the stone into carbon, as the employment of such a word would seem to indicate.

Ponton's "Petrarmite," brought out in 1885 (pat. 12,883), is formed by coating sand, gravel, granite, felspar, slags, or other hard substances, with thin milk of lime, with or

without soluble silica; the stone is then immersed in hot water containing a little silicate of soda, and then stored in lime-water tanks for a long period, and finally dried.

Brandstatter, a Viennese manufacturer, recently patented a stone composed of finely-ground quartz mixed with magnesia, or, for very hard stones, with litharge; chalk, marble, and limestone may also in some cases be employed. The powder is mixed with concentrated solution of water-glass, poured into moulds, submitted to a high pressure, dried, burnt in kilns, and carefully cooled.

An ingenious method for converting the soil, &c., surrounding piles and foundations in submarine and similar construction was patented in 1875 by Cooke and Thompson, who employed hollow pipes perforated with holes, through which chemicals, such as silicate of soda and chloride of calcium, could be injected alternately into the adjacent soil, so serving to bind it firmly into a species of concrete.

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

15,148, Bolts for Securing Shop-window Shutters, &c. J. Cardwell and J. Chandler.

As applied to shutter-bars, the bolt which is the subject of this patent is so constructed that it can be pushed through the shutter-bar and shutter into a suitable box or recess secured in the back of the shutter, and in which is a sliding spring-catch. This spring-catch is raised by the tapered end of the bolt, and springs back again into an angular groove, and so secures the bolt in position. To withdraw the bolt it is necessary to raise the spring-catch, and this can only be done from the inside of the shop.

15,476, Ventilating. E. Loftis.

The tubes are, according to the inventor's system, heated by hot water or steam contained in an outer casing, and in this way cold draughts are prevented.

15,821, Heating Machine-rooms, &c. F. and A. Craven and others.

According to this invention, heat from boiler furnaces is utilised by the use of an injector of special form, a jet of steam forcing the air through heated pipes. After completing its work, the heated air is again drawn in, and again passed through the injector and utilised, gaining a greater degree of heat.

16,619, Improved Lift or Elevator. S. P. Wilding.

This lift is described as totally unlike the ordinary form of elevator, and is intended for use in staircases, &c. The carriage is composed of a species of platform, which, when not in use, is doubled up against the wall or banister of the staircase. This platform and support are mounted as a little carriage, running on a guide or rail which follows the path of the staircase. Movement is communicated to the carriage by a cable running on the rail or guide, and governed by a very simple hydraulic motor; or electricity is used for the motive power.

17,018, Heat Radiators. J. Boyd, jun.

According to this invention, hollow cast-iron columns, fluted or ornamented as desired, are made to join together and act as radiators of heat furnished by steam-pipes, or such-like means. The columns are applied as legs to furniture or balusters, or for mantels or chimney-pieces, or for conservatory pillars and stands, &c.

21,199, Fanlights, &c. F. J. Gibbons.

To obviate the rattling of fanlight-frames, and to prevent them from being lifted out of their sockets by a sudden gust of wind, angular protective pieces are, by this invention, fitted to the joints, which, encircling the pivot, prevent the frame from being lifted, and causes a smooth and easy action. A second specification (2,889), by the same patentee, describes a method of fixing pulleys for window-sashes, in which axles are dispensed with, and a small round-edge wheel revolves by a pin, either cast or rivetted upon itself, working in a hollow groove or cavity.

12,830, Improved Sash-balance. J. McChesney and A. Cobham.

The sash-pulley which is the subject of this patent is made with a coiled spring, and when the sash is lowered, the spring is coiled up, and when it is intended to raise the sash, the force of the spring assists the movement.

## NEW APPLICATIONS FOR PATENTS.

Oct. 26.—15,398, H. Planner, Disinfecting Apparatus for w.c.'s.—15,411, W. and G. Heywood, Automatically Disinfecting w.c.'s.—15,420, F. Lamcraft, Window-sashes.—15,434, W. Yull, Drain-traps.—15,441, F. Ransome, Furnaces for Burning Cement.—15,421, W. Hooks, Sifting and Washing Sand, &c., for Building Purposes.

Oct. 27.—15,461, D. Burns and J. Cairns, Regulating and Fixing Fanlights, Ventilators, &c.—15,469, G. Beck and E. Hancock, Constructing

Scaffolding, &c.—15,489, G. Jennings, Sanitary Appliances.

Oct. 29.—15,510, J. Turner, Combination Door-chain, Bolt, or Bar.—15,531, J. and A. Duckett, Water-closets.—15,541, C. Henman, Bolts or Fastenings for Doors.—15,543, E. Newton, Horizontal

tural Buildings.—15,568, B. Richardson and E. Dickinson, Guards for Brick-making Machines.

Oct. 30.—15,576, P. Walker, Ventilating Rooms.—15,583, J. Bewick, Draught and Dust Excluders for Doors.—15,588, R. Lyon, Brick-moulding Machine.—15,601, C. Harcourt, Electric Bell-pulls,

Fittings.—15,605, L. Barber, Ladder.—15,610, Rothwell, Ventilating.—15,613, T. Penario, Water-waste Preventing Cisterns.—15,621, E. Lyon, Decorative Window Panes or Panels.—15,650, A. Clarke,

Fire-grates and Stoves.—15,653, W. Gostley and G. Burton, Window-sash Fasteners.

Oct. 31.—15,668, W. Smith, Wood-planing Machines.—15,680, H. Ames, Fireplaces.—15,722, W. Taylor, Step-ladders.—15,725, S. Worsworf, Coals or Ventilators.

Nov. 1.—15,745, J. Porter, Preventing Down-draughts in Chimneys, &c.—15,747, E. Baker, Draught and Dust Excluders.—15,795, P. Davies, Lead Tanks and Ventilating same.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

12,350, J. Elwell, Portable Covering or Roof.—13,193, J. Lawson, Heating Buildings.—13,393, R. Hooking, Self-flushing Apparatus for Sewers, Drains, &c.—13,448, A. Caldwell, Regulating the Flow of Water in Dwelling-houses, &c.—13,505, T. White and J. Beal, Gas-pipe Hooks.—13,509, J. Shanks, Syphonal Cisterns for Water-closets.—13,531, H. Shorman, Window-sash Fastener.—13,562, J. Hartford, Sewer Pipes.—13,743, J. Howie, Water-closet Basins.—13,758, E. Stone, Bricks, Tiles, &c.—13,906, J. Cook, Drain Pipes, &c.—13,949, J. Jackson, Water-closet Cisterns.—14,237, R. Seabury, Speaking Tubes.—14,258, J. Oates, Machinery for Cutting the Edges of Paper previous to Hanging.—14,286, J. Ransome, Artificial Stone and Concrete Blocks.—14,358, W. Bishop, Slow-combustion Stoves.—14,418, A. Ransford, Automatically Lighting Starlights, Gaslights, &c.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

14,184, J. Fairbairn and R. Jones, Door and Window Fasteners.—17,919, D. Heya, Balancing Weights for Windows, Doors, &c.—1,062, G. Verin, Chimney-pots, &c.—2,410, R. Lowe, Combined Sullery Sink, Pipe, and Trap.—12,325, W. Yelland, jun., Sash-fasteners.—14,014, J. Jones, Attaching Cords to Sash-windows.—14,104, E. Dickinson and F. Kindermann, Ventilating Appliances.—14,159, N. Hespworth, Shop-fronts.—14,166, L. Boutin, Chimneys and Ventilators.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

Oct. 25.

By D. SMITH, SON, & OAKLEY (at Abergavenny).

Abergavenny—"The Goldbrook Park Estate"  
Ground-rents of £20, 14s. 6d., reversion in 66 years ..... 4720  
Freehold land, 2 or 31 acres ..... 400  
A freehold range of stables ..... 500  
Enclosures of land, 7a. 2r. 2p., freehold ..... 750  
"Yabty Farm," 85a. 0r. 19p., freehold ..... 5,000  
"Pew Farm," 107a. 1r. 35p., freehold ..... 2,000  
"Tyr-Pell Farm," 105a. 3r. 3p., freehold ..... 2,900  
"Great Herdwick Farm," 96a. 3r. 1p., freehold ..... 5,000  
"Lower Llanfoist Farm," 155a. 3r. 24p., freehold ..... 6,000

Oct. 29.

By G. A. WILKINSON.

Soho—34 and 36, Warlow-street, freehold ..... 2,800  
23, Gerrard-street, freehold ..... 1,750  
Streatham Hill—1 and 2, St. Ann's-place, 37 years, ground-rent £28 ..... 880  
4, St. Ann's-place, 49 years ground-rent £11, 6s. 4d. .... 480  
A plot of leasehold land, in rear ..... 240

By BAXTER, PAYNE, & LEPPIN.

Beckenham—"Acton Lodge," 60 years, ground-rent £8 ..... 1,350  
New Cross—21, Pepp's-road, 60 years, ground-rent £10 ..... 350

By R. PRICE.

Clapham—133, Manor-street, 26 years, ground-rent £4, 15s. .... 230

By J. R. EY.

Bedford, near—Several cottages, and 4a. 1r. 8p., freehold ..... 620  
Two cottages, and garden ..... 129  
Freehold enclosure of woodland, 17a. 0r. 28p. .... 300

By BROWN & FOULKES (at Berkhamshead).

Berkhamstead, King's-road—A plot of freehold land ..... 250

Oct. 30.

By SHERRIN & COLTMAN.

Notting Hill—302, Portobello-road, 76 years, ground-rent £8 ..... 135

By WALTON & LEE.

Horsham, near—"The Baynard's Park Estate," of 1,616 acres, freehold ..... 39,000

By E. ROBIN & HINE.

City—103 and 104, Aldersgate-street, freehold ..... 3,550  
By JONES, LARGO, & CO.

Canbury—3, Douglas-road, 33 years, ground-rent £10 ..... 335

By DEBENHAM, TAYSON, & CO.

Paddington—Ground-rent of £20, term 50 years ..... 400  
Watford, near—An enclosure of land, 4a. 2r. 0p., freehold ..... 400  
Two cottages with gardens, freehold ..... 280



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| By REYNOLDS & EASON.                                                                                                                                                                                                                                                                                                                          |       |
| oplar-15 to 22, Sopha-street, freehold; 1 to 10, Batsford, Lincolns, 4 years, ground-rent £50; 86, Well-street, and 1 to 6, Palace-ard, Hackney, 67 years, ground-rent £16; 2 to 12, even Church-street, and 1 to 4, Abbey-road, 37 years, ground-rent, £20; 70 and 61, Gurney-road, Leytonstone, 88 years, ground-rent, £10. 10s., in on lot | 3,750 |
| Nottingham Philip-lane-The freehold residence, "Reichorn"                                                                                                                                                                                                                                                                                     | 1,230 |
| Stratford—Ground rents of £71 a year, reversion in 70 years                                                                                                                                                                                                                                                                                   | 1,895 |
| 1 to 13, Walton-terrace, freehold                                                                                                                                                                                                                                                                                                             | 2,160 |
| oplar-115, High-street, copyhold                                                                                                                                                                                                                                                                                                              | 170   |
| alington-19, Cloudeley-road, 6 years, ground-rent £4. 16s. 6d.                                                                                                                                                                                                                                                                                | 76    |
| By C. G. COLLES & CO.                                                                                                                                                                                                                                                                                                                         |       |
| arrow-road-28, Alfred-road, 50 years, ground-rent £5                                                                                                                                                                                                                                                                                          | 380   |
| 7, Senior-street, 71 years, ground-rent £7. 1s. 6d.                                                                                                                                                                                                                                                                                           | 370   |
| 47 and 65, Westbourne Park-crescent, 71 years, ground-rent £16                                                                                                                                                                                                                                                                                | 570   |
| 38, Westbourne terrace, N., 62 years, ground-rent £12                                                                                                                                                                                                                                                                                         | 430   |
| Nos. 300, 32, and 304, 70 years, ground-rent £45                                                                                                                                                                                                                                                                                              | 3,370 |
| 1 to 6 odd, Worcester-street, 70 years, ground-rent £47                                                                                                                                                                                                                                                                                       | 2,900 |
| 2, Westbury-road, freehold                                                                                                                                                                                                                                                                                                                    | 580   |
| 43, Burlington-road, 71 years, ground-rent £10. 10s.                                                                                                                                                                                                                                                                                          | 550   |
| 20, Artesian-road, 58 years, ground-rent £10. 10s.                                                                                                                                                                                                                                                                                            | 540   |
| 7 to 11, Chichester-place, 70 years, ground-rent £12                                                                                                                                                                                                                                                                                          | 1,760 |
| 1, 2, and 3, Cirencester-street, 69 years, ground-rent £13                                                                                                                                                                                                                                                                                    | 940   |
| 4 and 6, Cirencester-street, 69 years, ground-rent £20                                                                                                                                                                                                                                                                                        | 1,020 |
| Barry-terrace—Ground-rents of £16, reversion in 70 years                                                                                                                                                                                                                                                                                      | 370   |
| Westbury-road—Ground-rents of £34. 10s., reversion in 63 years                                                                                                                                                                                                                                                                                | 845   |

|                                                                                                               |        |
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| By A. WATSON.                                                                                                 |        |
| Old Ford-1 to 7 odd, Roman-road, 68 years, ground-rent £10. 10s.                                              | 1,410  |
| By CHURCH, GALLSWORTHY & CO.                                                                                  |        |
| Peachbrook-street—Ground-rent of £1,256, reversion in 68 years                                                | 33,000 |
| Portsmouth—Imp. of great street of 462 feet, 13 years                                                         | 510    |
| 126 and 123, High-street, 13 years, ground-rent £28                                                           | 800    |
| By C. R. CROSS.                                                                                               |        |
| Notting hill-63, St. James's-square, freehold                                                                 | 740    |
| By L. FARMER.                                                                                                 |        |
| Kilburn-232, High-street, 93 years, ground-rent £20                                                           | 1,225  |
| 304, High-road, 94 years, ground-rent £38                                                                     | 1,145  |
| By D. SMITH, SON, & OAKLEY.                                                                                   |        |
| ants-The Evelyn House Estate, about 491a., freehold, of which a cottage and 3a. 13p. realised                 | 400    |
| By C. H. WHITTY.                                                                                              |        |
| Battersea 44 to 52 even, Inworth-street, 85 years, ground-rent £20                                            | 850    |
| Portsmouth—Imp. of great street of 462 feet, 13 years                                                         | 475    |
| Walworth, Victory-place—A plot of freehold land. A plot of building land, area 1,275 ft., let at £23 per plot | 400    |
| A plot of building land, area 1,065 ft., let at £19 per plot                                                  |        |
| Two plots of building land, area 2,390 ft., let at £14 per p'ot                                               |        |
| A plot of building land, area 843 ft., let at £27 per plot                                                    |        |
| 8 and 10, Arthur-street, 44 years, ground-rent £7                                                             | 550    |
| Weyington-12 and 13, Circular-road, 12 years, ground-rent £10                                                 | 400    |
| 14s, St. David's street, 8 years, ground-rent £4                                                              | 65     |
| lanberwell-1, Blucher-road, 73 years, ground-rent £4                                                          | 315    |

|                                                                         |       |
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| By PERKINS & CHAM.                                                      |       |
| Hammondsey-23 and 24, Marine-street, freehold                           | 540   |
| By NEWSON & HARDING.                                                    |       |
| dercup-The residence called "Woodville," 81 years, ground-rent £15      | 800   |
| aconbury-13, Alma-road, 71 years, ground-rent £9                        | 300   |
| rent £6. 6s.                                                            | 305   |
| 80, Tollyton Park, 76 years, ground-rent £8. 8s.                        | 315   |
| alington-25, William-street, 67 years, ground-rent £5                   | 275   |
| 1 to 5, Milner-street, 39 years, ground-rent £45. 10s.                  | 2,150 |
| By HERRING, SON, & DAW.                                                 |       |
| Westham-1, Leigham-avenue, and 4 acres, 39 years, ground-rent £69 16s.  | 1,300 |
| By COLLIER & COLLINS.                                                   |       |
| Capitalfields-1 to 8, Harri-place, freehold                             | 1,030 |
| oplar-9 and 10, Union-street; and 18 and 19, Providence-place, freehold | 376   |

**Builders' Exchange, Pittsburgh.**—The Builders' Exchange of Pittsburgh has appointed a Committee for the purpose of selecting a site or the erection of an Exchange, at a cost of about 200,000 dols. The building is to be on plans similar to those of the Philadelphia, Boston, and Chicago Exchanges. The basement is to contain a Trades School for the education of boys to be carpenters, painters, masons, bricklayers, and for giving instruction in all the other handicrafts appertaining to the building trades. The first floor is to accommodate a banking business for the use of contractors, valuers, architects. The second floor is to be the Exchange proper, where contractors and architects may meet and make agreements, and where property owners may come and negotiate about the erection of buildings. The third floor is intended for the business meetings of the exchange.

## MEETINGS.

MONDAY, NOVEMBER 12.

**Surveyors' Institution.**—Opening Address by the President (Mr. E. F. Squarey). 8 p.m.  
**Leeds and Yorkshire Architectural Society.**—(1) Address by the President, Mr. H. Perkin. (2) Distribution of Prizes. 7.30 p.m.

TUESDAY, NOVEMBER 13.

**Institution of Civil Engineers.**—(1) Distribution of Medals, Prizes, and Papers awarded at the close of last Session. (2) Mr. W. Worby Beaumont on "Friction-Brake Dynamometers." 8 p.m.

WEDNESDAY, NOVEMBER 14.

**St. Paul's Ecclesiastical Society.**—Mr. W. H. St. John Hope, F.S.A., on "The actual uses of Colours in the Medieval Church of England." 7.30 p.m.  
**Liverpool Engineering Society.**—Mr. T. Mellard Read, F.G.S., on "The Advantages to the Civil Engineer of a Study of Geology." 8 p.m.  
**Birmingham Architectural Association.**—Annual Conversazione.

THURSDAY, NOVEMBER 15.

**The Arts and Crafts Exhibition Society.**—Mr. Emery Walker on "Letterpress Printing." 8.30 p.m.  
**Edinburgh Architectural Association.**—Mr. J. Crabth Watt, F.S.A., on "The Aesthetics of City Building." 8 p.m.

FRIDAY, NOVEMBER 16.

**Architectural Association.**—Mr. A. T. Walmisley on "Arches and Vaulting." 7.30 p.m.  
**Institution of Civil Engineers (Students' Meeting).**—Mr. E. C. de Segundo on "Experiments on Beams." 7.30 p.m.

## Miscellaneous.

**Leeds and Yorkshire Architectural Society.**—The opening meeting of this Society will be held on Monday next, November 12th, at the Queen's Hotel, when, after an address by the President (Mr. Henry Perkin), there will be a social entertainment and smoking concert, which appears to be a "new departure" in architectural societies' meetings.

**Manchester Society of Architects.**—The annual meeting and election of council of the Manchester Society of Architects took place on the 31st ult. Mr. W. A. Royle was re-elected President, the other members of the Council being:—Mr. Redmayne, F.R.I.B.A., Vice-President, Mr. R. K. Freeman, F.R.I.B.A., Mr. J. Murgatroyd, F.R.I.B.A., Mr. R. J. Bennett, F.R.I.B.A., Mr. H. Bridgford, Mr. J. Medland Taylor, Mr. John Ely, and Mr. Paul Ogden, A.R.I.B.A., the two latter gentlemen being hon. secretaries.

**Competition: Newport Board Schools.**—The Newport United District School Board having some time back advertised for designs for new schools at Spring-gardens, Newport, Mon., to accommodate 1,000 children, designs from several local architects were submitted. After several meetings of the Board, they reduced the number to two designs, these being subsequently forwarded under motto, we are informed, to a leading architect (name not mentioned), who decided in favour of the one submitted by Mr. E. A. Lansdowne, of Newport, which design the Board afterwards unanimously adopted. Tenders received for the carrying out of the work appear in this week's issue.

**Manchester Students of the Institution of Civil Engineers.**—The opening meeting of the fifth session of the Association of Manchester Students of the Institution of Civil Engineers was held on Wednesday evening, October 31, at the Athenaeum, Princess-street, Manchester, the President, Mr. A. Jacob, B.A., M.Inst.C.E., in the chair. The Hon. Sec., Mr. A. D. Greatorex, Stud.Inst.C.E., read the President's address, in which he drew attention to the growth of civil engineering and its recognition by the public, and as belonging to the learned professions; also to the great works executed by our ancestors. After a few remarks by Mr. R. Vawser, M.Inst.C.E., P.P., and Mr. W. T. Olive, Assoc.M.Inst.C.E., a vote of thanks was unanimously passed to Mr. Jacob for his address. The first visit of the session took place on Saturday afternoon, November 3rd, when, by the kind permission of Mr. E. Leader Williams, M.Inst.C.E., Vice-President, a visit was paid to the Salford Section of the Manchester Ship Canal, over which the members were conducted, in the unavoidable absence of Mr. Williams, by Mr. Jno. Kyle, M.Inst.C.E., Resident Engineer, who explained the various details of the work. On the motion of Mr. Jacob, seconded by Mr. C. S. Allott, M.Inst.C.E., and supported by Mr. W. A. Royle, President of the Manchester Society of Architects, a vote of thanks was passed with acclamation to Mr. Williams and Mr. Kyle for the afternoon's visit.

**Liverpool Engineering Society.**—A meeting of the Liverpool Engineering Society was held last week at the Royal Institution, Liverpool, Mr. C. H. Darbishire, Assoc.M.Inst.C.E., in the chair, when a paper was read by Mr. R. S. Wyld, M.Inst.C.E., on "The Laying of Large Mains." The author, after referring to the ancient aqueducts, stated that the power to construct iron pipes had only been obtained within the past century. He referred to the different materials of which a main might be constructed, and adduced arguments in favour of cast iron, stating that the larger the main the more water was delivered relatively to the weight of the iron employed. He referred to various means of transit over rough ground, and appliances for laying large pipes in the trenches. The necessity for sluice drains in every hollow, and an air-cock with additional aperture always open, permitting a slight leak, but preventing any accumulation of air. Drawings of some of the works on the Vyrnwy Aqueduct were shown by the courteous permission of the engineer, Mr. G. F. Deacon, M.Inst.C.E., to illustrate the manner in which such obstructions as rivers, railways, and canals were overcome.

**Society of Arts.**—The 135th Session of this Society will commence on Wednesday, the 21st of November, with an Opening Address by the Duke of Abercorn, C.B., Chairman of the Council. Previous to Christmas there will be four ordinary meetings, in addition to the opening meeting. At the first ordinary meeting of the Society a paper will be read by Colonel Couraud, on "The Phonograph." This will be followed by one by Mr. Henry Edmunds, on "The Graphophone." At the other two meetings to be held before Christmas the papers will be by Mr. W. H. Deering on "Explosives," and by Mr. W. J. Dibdin, on "Standards of Light." Among the papers announced for the latter part of the session may be mentioned—"Manufacture of Savres Porcelain," by Mr. E. Garner (Director of the Savres Manufactory); "The Forth Bridge," by Mr. Benjamin Baker; "The Channel Tunnel," by Colonel Hozier; and "Secondary Batteries," by Mr. W. H. Preece, F.R.S. The first course of Cantor lectures will be by Captain W. de W. Abney, C.B., F.R.S., on "Light and Colour"; the other lecturers will be Mr. Alan S. Cole, Mr. W. J. Linton, Mr. Walter Crane, Mr. C. V. Boys, F.R.S., and Mr. H. Graham Harris.

**The English Iron Trade.**—The English iron market, notwithstanding the advanced season and the late unfavourable influences, keeps steady, on the whole, a moderate trade being done in pig-iron, with a well-sustained demand for finished iron and steel. Although the Scotch warrant-market has been quiet, rates have kept tolerably steady, but prices offered by Scotch makers are somewhat irregular. Pig-iron in the North of England is very firm, notwithstanding restricted business, and the same remark applies to the Lancashire crude iron trade. Hematite iron is slightly weaker in the north-west, there being less pressure on the part of buyers, and the quotation has receded 9d. a ton, or to 44s. 6d. net, f.o.b., for mixed numbers of Bessemer. The outlook in the pig-iron market of Staffordshire is hopeful. Manufactured iron is very strong, although the inquiry is a shade less active. Tin-plates are quoted about 3d. a box lower, but the demand continues good. The steel market has not changed much, trade being, on the whole, good. Shipbuilders keep busy, and are securing fresh orders. Engineers are well employed.—*Iron.*

**Devonshire Properties for Sale.**—The North Estate, situated in Washfield and Tiverton parishes, will be offered for sale by auction, at Tiverton, on the 13th inst. The entire estate, to be divided, if desired, into twenty-two lots, covers rather more than 900 acres, yielding an annual rental which is estimated at 1,555*l.*; and it contains beds of manganese and iron ore. Besides various farms and dairies, the several lots include the Great Beauchamp farm, some cottage holdings, Little Beauchamp homestead, and the old manor-house at Washfield. The Exe runs through a portion of this property, and in the village are a few good building sites, comprised in the sale, which have a wide view over the river's valley. A sum of 5,000*l.* is asked for the freehold, with timber, fixtures, &c., of Sektor Hall, less than one mile from Axminster, together with its appurtenant smithies, eight cottages, and sixty acres of pastures and woodland, the latter providing good shooting and trout-fishing.



**Cardigan Estates, Leeds: First Portion.**—We lately adverted\* to the contemplated sale, by the late Lord Cardigan's trustees, of Kirkstall Abbey, and its grounds of twelve acres. Next December will be offered for sale by auction at Leeds, by Messrs. Chinnock, Galsworthy, & Chinnock, a large number of properties belonging to the Cardigan estates. These comprise the Abbey House at Kirkstall, which formed the northern and chief gatehouse to De Lacy's Cistercian abbey there, and became, at the surrender, the last abbot's residence; some freeholds, being 422 acres in all, at Burley and Headingley, including Cardigan Fields by the Aire, Woodlands, Batty Wood, overlooking the Meanwood Valley, the Grove spinning-mills with the Ganister stone-crushing mills, Abbey View, and various farms; some farms (about 910 acres in all) in the townships of Drighlington, Gildersome, and Farnley, in the neighbourhood of Leeds, with Park Spring Woods and its extensive stone beds; other farms, holdings, garden lands, and wharfs (492 acres) in Bramley, Kirkstall Hall, and the quarry at Bramley Fall Wood; various building sites and tenements around Kirkstall and Horsforth, with the Woodside paper-mills (330 acres); and certain freehold ground-rents, amounting to 913*l.* per annum, secured upon divers residences, mills, inns, market gardens, and the like, situated at Bramley, Kirkstall, Burley, and Headingley,—all these latter being within the borough of Leeds, and including almost the entire village of Kirkstall.

**Plumbers' Work at Newcastle-on-Tyne.** On Monday the Princess Louise opened the new College, and inspected the specimens of work done by apprentice plumbers. The Master of the Worshipful Company of Plumbers of the City of London (Mr. W. H. Bishop) explained to Her Royal Highness the work which the Company was undertaking in connexion with the technical education of plumbers. He said that the Corporations of Newcastle and Gateshead, as well as the plumbers of those towns, were among the first supporters of the movement for the registration of competent plumbers; and by the joint action of those bodies practical classes have been carried on during the past two years under the personal direction of a committee of plumbers.

**Presentation of a Fountain to the City of Glasgow.**—At the meeting of the Glasgow Town Council on the 80th ult., it was announced that Messrs. M'Dowall, Steven, & Co. had offered to present to the Corporation the large and elaborate fountain which at present stands in the Exhibition grounds, nearly opposite the Kelvin-grove Park Museum Buildings. Messrs. M'Dowall, Steven, & Co., in their letter offering the gift, suggested that the fountain should be allowed to remain in its present situation, which they considered to be admirably suited for it. The Lord Provost said he thought it was only right that they should record in the minutes of the Council a vote of thanks to Messrs. M'Dowall, Steven, & Co., for their valuable gift,—a gift which was a good specimen of Glasgow work.

**The New Palace of Christiansborg at Copenhagen.**—The commission appointed for considering the designs and estimates for the new Palace of Christiansborg at Copenhagen, on the site of the old one destroyed by fire some years ago, has decided upon awarding premiums for three of the five designs sent in for final competition,—viz., one of £280, and two of £170 each. The commission, being unable to accept any one design in its entirety, has decided upon not awarding the first premium of £350 offered for this purpose.

**Berlin.**—A new concert-room, called the "New Philharmonic," has just been opened here. There is room for 2,900 persons,—namely, for 2,500 spectators and 400 performers. Mr. Franz Schwenken was the architect. —On the accession of a new monarch the municipality usually presents a gift to the sovereign. In the present case this will take the form of a magnificent fountain in bronze, with allegorical figures of the four principal rivers of Prussia. The site has not yet been definitely fixed. The model, which is ready for casting, is by the sculptor, Prof. Reinhold Beggs.

**Improvements at Naples.**—A Naples journal states that the Municipal authorities of that city have decided upon some great improvements. A large number of the old parts and rookeries of the town are to be pulled down, and new quarters erected on the sites. All the houses at Castel Nuovo, too, are to come down. The work will be extended over ten years.

**New Board Schools, Loughton, Essex.** A new Board School for 360 boys was opened here on the 22nd ult. The buildings comprise a general schoolroom, 93 ft. by 22 ft., lighted by large and lofty windows, along one side and one end; three class-rooms opening out of it, each 30 ft. by 22 ft.; a master's room and a cloak-room, boiler-room, and store-rooms in the basement. As the ground falls from front to back a covered playground is formed below the whole area of the largest room. The walling is of picked stocks and of local red bricks, with dressings of hard-pressed bricks from Birmingham. Where there is reason to expect most wear and tear, the corners of the jambs and piers are formed of Staffordshire rounded blue bricks. The roofs are covered with Reading tiles. A specially-arranged system of inlet and outlet ventilation is adopted in the school-room and class-rooms. The heating, on the low-pressure system, has been undertaken by Messrs. J. Jones & Sons, of Farringdon-street, E.C. The builders are Messrs. Everett & Son, of Colchester, and the architect is Mr. James Cubitt. The contract for the buildings, including drainage, boundary-walls, and the formation of a large playground, amounted to 2,950*l.*

**Salt Water for Street-watering and Sewer-flushing.**—The Town Council of the Borough of Bootle-cum-Linacre, at their last meeting, adopted the recommendation of the Health Committee, that a service of salt water be provided for street-sprinkling and sewer-flushing, and that the sum of 5,000*l.* be borrowed for the purpose, and that the Borough Surveyor be authorised to carry out the works set forth in his reports to the Health Committee. A supply of salt water was provided about twelve months ago to supply the Public Baths, and the present proposal is to extend the pipe lines throughout the more important streets of the borough, and to erect, on the highest available ground, a tank to contain 50,000 gallons of water, which will give a sufficient pressure on the hydrants, and will provide a sufficient quantity of water between the intervals of pumping. The whole of the works of the original scheme, as well as the proposed extension, have been designed by the Borough Surveyor, Mr. W. N. Blair, Assoc.-M. Inst. C.E.

**House Building in the Metropolis since 1849.**—Sir Charles Warren, in his annual report on the Metropolitan Police Force, which has been issued lately, cites some interesting figures as to the enormous number of houses which have been erected, and the great increase of the population which has taken place in the metropolis since 1849. The figures are given with the view of showing that there is at present an urgent necessity for a very material increase in the strength of the force. The Commissioner says that since the year 1849, when the authorised strength of the force was only 5,493, there have been built 500,852 new houses, while 3,403 are now in course of erection; 1,633 miles of new streets have also been added, to the charge of the police, and the population has increased from 2,473,758 to 5,476,447.

**The Sound Tunnel.**—In accordance with the report of the Commission appointed for the consideration of the Sound Tunnel scheme, the Danish and Swedish Governments have refused to grant the concession for its construction applied for by a French syndicate. The chief reason of the refusal was that, whilst the interest annually on the capital required for its construction would amount to about 45,000*l.*, the utmost receipts would not exceed, it was shown, 30,000*l.* a year, so that the tunnel would require a heavy annual subsidy.

**The Baltic-North Sea Canal.**—The work on the canal which is to connect the North Sea with the Baltic is being vigorously carried on, but it has been discovered that the canal can hardly be completed in less than eight years. The work of excavation has been entrusted to a Dutch firm at Greenloo for a sum of 600,000*l.*, the official estimate of cost being 750,000*l.* When this canal is completed, the present Eider Canal, which has been open for 100 years, will be valueless.

**Lifts.**—We are informed that Messrs. Clark, Bennett, & Co. (Limited), of Rathbone-place, are constructing three hydraulic lifts for the new addition at Guy's Hospital, and that they have also in hand hydraulic lifts for the General Post-Office, London, and the Bank of England.

**The Bath Freestone Quarrying Company (Limited).**—The prospectus of this new company will be found in our advertising columns this week.

**A Premium of 25,000 Francs.**—It is remembered that the King of the Belgians in 1874, founded an annual premium of 25,000 francs for eminent services rendered to science. The prize for 1893 is to be for the best solution of the question how large cities are to be supplied efficiently with pure drinking-water. In solving this question the local conditions of Brussels are to be dealt with in the first place, but probable increases in urban populations generally are also to be taken into consideration. Works already in print to be admitted to the competition only if the editions contain important changes and additions which, like the other prize-essays, have been published during 1889 to 1892, the period fixed for the competition. The prize-essays may be in Dutch, German, English, French, Italian or Spanish, and must be sent in by January 1893, to the Belgian Ministry of Agriculture, Industry, and Public Works. The jury, too, appointed by the King of the Belgians, is consist of three Belgians and four representatives of other nations.

**The Glasgow Exhibition is to close** Saturday, the 10th inst. At the last meeting of the Glasgow Town Council, the Parks Committee presented their minutes, detailing the results of the negotiations with the Exhibition Executive as to taking over the buildings. The Corporation undertaking to accept the same "in full implement" (which, being translated, means, "in full discharge") of the obligations of the Exhibition Executive to restore the grounds of the park to their original condition. It is assumed that the value of the buildings is about 10,000*l.*, and the cost of their demolition and the restoration of the grounds is estimated at 2,000*l.*, so that it is calculated there will be a substantial addition to make to the already large Exhibition surplus. But the Exhibition Committee, in offering the buildings to the Corporation, expressed the hope that the Corporation might see their way to preserve intact that portion of the building which constitutes the Fine Art Section.

**Jerry-building in Moscow.**—The *Daily Chronicle* of Nov. 3, reports:—"In Moscow another large building has just fallen down, but luckily without causing any loss of life. It appears that there is a good deal of 'jerry-building' going on in that town, and it is improbable that some of the builders of the man-traps will be brought into the law courts."

**International Ironmongers', Iron, and Metal Trades' Exhibition.**—This Exhibition will be opened on Monday next, at 1 p.m., at the Royal Agricultural Hall, Islington. It will remain open until the 24th inst.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |             | £. | s. | d. | £. | s. | d. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----|----|----|----|----|----|
| Teak, E.I.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | load        | 8  | 0  | 0  | 12 | 10 | 0  |
| Sequoia, U.S.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | foot cube   | 0  | 2  | 8  | 0  | 3  | 0  |
| Birch, Canada                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | load        | 2  | 15 | 0  | 4  | 15 | 0  |
| Fir, Dantisc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | load        | 2  | 10 | 0  | 4  | 10 | 0  |
| Oak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | load        | 2  | 0  | 0  | 4  | 10 | 0  |
| Canada                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | load        | 4  | 0  | 0  | 6  | 10 | 0  |
| Pine, Canada red                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | load        | 2  | 10 | 0  | 3  | 10 | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | yellow      | 2  | 10 | 0  | 4  | 10 | 0  |
| Lath, Dantisc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | fathom      | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | load        | 5  | 0  | 0  | 6  | 0  | 0  |
| Waincoat, Odessa, crown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | load        | 2  | 10 | 0  | 3  | 0  | 0  |
| Deals, Finland, 2nd and 1st, std. 100                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | load        | 9  | 0  | 0  | 10 | 0  | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 4th and 3rd | 7  | 0  | 0  | 9  | 0  | 0  |
| Riga                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | load        | 7  | 0  | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | load        | 9  | 10 | 0  | 15 | 10 | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2nd         | 9  | 0  | 0  | 10 | 0  | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | white       | 7  | 10 | 0  | 10 | 10 | 0  |
| Swedish                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | load        | 7  | 10 | 0  | 16 | 10 | 0  |
| White Sea                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | load        | 8  | 10 | 0  | 17 | 10 | 0  |
| Canada, Pine, 1st                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | load        | 16 | 0  | 0  | 25 | 10 | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2nd         | 10 | 10 | 0  | 17 | 10 | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3rd, &c.    | 7  | 10 | 0  | 10 | 10 | 0  |
| Canada, Spruce, 1st                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | load        | 7  | 0  | 0  | 10 | 0  | 0  |
| " "                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3rd and 2nd | 7  | 0  | 0  | 8  | 10 | 0  |
| New Brunswick, &c.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | load        | 6  | 10 | 0  | 8  | 0  | 0  |
| Battens, all kinds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | load        | 5  | 10 | 0  | 12 | 0  | 0  |
| Flooring, Boards, 8 1/2, 1 in, 1 1/2, 2 in, 3 in, 4 in, 5 in, 6 in, 7 in, 8 in, 9 in, 10 in, 11 in, 12 in, 13 in, 14 in, 15 in, 16 in, 17 in, 18 in, 19 in, 20 in, 21 in, 22 in, 23 in, 24 in, 25 in, 26 in, 27 in, 28 in, 29 in, 30 in, 31 in, 32 in, 33 in, 34 in, 35 in, 36 in, 37 in, 38 in, 39 in, 40 in, 41 in, 42 in, 43 in, 44 in, 45 in, 46 in, 47 in, 48 in, 49 in, 50 in, 51 in, 52 in, 53 in, 54 in, 55 in, 56 in, 57 in, 58 in, 59 in, 60 in, 61 in, 62 in, 63 in, 64 in, 65 in, 66 in, 67 in, 68 in, 69 in, 70 in, 71 in, 72 in, 73 in, 74 in, 75 in, 76 in, 77 in, 78 in, 79 in, 80 in, 81 in, 82 in, 83 in, 84 in, 85 in, 86 in, 87 in, 88 in, 89 in, 90 in, 91 in, 92 in, 93 in, 94 in, 95 in, 96 in, 97 in, 98 in, 99 in, 100 in | load        | 0  | 11 | 0  | 0  | 14 | 0  |
| Second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | load        | 0  | 8  | 0  | 0  | 10 | 0  |
| Other qualities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | load        | 0  | 5  | 8  | 0  | 7  | 0  |
| Cedar, Cuba                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | load        | 0  | 8  | 0  | 0  | 10 | 0  |
| Honduras, &c.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | load        | 0  | 0  | 32 | 0  | 0  | 0  |
| Australian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | load        | 0  | 0  | 2  | 0  | 0  | 0  |
| Mahogany, Cuba                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | load        | 0  | 0  | 42 | 0  | 0  | 0  |
| St. Domingo, cargo average                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | load        | 0  | 0  | 42 | 0  | 0  | 0  |
| Mexican                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | load        | 0  | 0  | 0  | 0  | 0  | 0  |
| Tobacco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | load        | 0  | 0  | 42 | 0  | 0  | 0  |
| Tonduras                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | load        | 0  | 0  | 42 | 0  | 0  | 0  |
| Bor. Turkey                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | load        | 5  | 0  | 0  | 12 | 0  | 0  |
| Walnut, Italian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | load        | 0  | 0  | 42 | 0  | 0  | 0  |

## METALS.

|                                 |    |    |   |    |    |   |
|---------------------------------|----|----|---|----|----|---|
| Iron—Bar, Welsh, in London, ten | 4  | 17 | 6 | 5  | 0  | 0 |
| " " at works in Wales           | 4  | 7  | 6 | 4  | 10 | 0 |
| " " at works in London          | 5  | 15 | 0 | 7  | 0  | 0 |
| Copper—                         |    |    |   |    |    |   |
| Best selected                   | 91 | 0  | 0 | 84 | 0  | 0 |
|                                 | 82 | 0  | 0 | 85 | 0  | 0 |



| METALS (continued).    |           |           |  | OILS.                  |          |          |  |
|------------------------|-----------|-----------|--|------------------------|----------|----------|--|
|                        | 2. s. d.  | 2. s. d.  |  |                        | 2. s. d. | 2. s. d. |  |
| COPPER—Sheets, strong  | 88 0 0    | 88 0 0    |  | Lined                  | 19 2 6   | 19 5 0   |  |
| —Chili, bars           | 78 15 0   | 0 0 0     |  | Cocunut, Cochiti       | 28 10 0  | 27 10 0  |  |
| YELLOW METAL           | 0 0 7 1/2 | 0 0 7 1/2 |  | Ceylon                 | 25 0 0   | 25 10 0  |  |
| LEAD                   |           |           |  | Palm, Lagos            | 28 0 0   | 0 0 0    |  |
| Pig, Spanish           | 13 10 0   | 0 0 0     |  | Rapeseed, English pale | 30 15 0  | 0 0 0    |  |
| English, common brands | 0 0 0     | 0 0 0     |  | — brown                | 29 5 0   | 0 0 0    |  |
| Sheet, English         | 14 15 0   | 0 0 0     |  | Cottonseed, refined    | 22 10 0  | 0 0 0    |  |
| SEWERS                 |           |           |  | Tallow and Oleine      | 19 0 0   | 45 0 0   |  |
| Silesian, special      | 19 0 0    | 19 2 6    |  | Lubricating, U.S.      | 5 0 0    | 8 0 0    |  |
| Ordinary brands        | 18 17 6   | 19 0 0    |  | — refined              | 7 0 0    | 12 0 0   |  |
| TIN                    |           |           |  | TURPENTINE—            |          |          |  |
| Straits                | 102 5 0   | 0 0 0     |  | American, in casks     | 1 15 3   | 0 0 0    |  |
| Australian             | 102 15 0  | 0 0 0     |  | Tar—                   |          |          |  |
| English Ingots         | 104 10 0  | 0 0 0     |  | Stockholm              | 1 1 6    | 0 0 0    |  |
| ZINC—English sheet     | 22 10 0   | 23 10 0   |  | Archangel              | 0 11 0   | 0 11 0   |  |

## COMPETITIONS, CONTRACTS, &amp; PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## COMPETITIONS.

| Nature of Work.                                          | By whom required.                    | Premium.   | Designs to be delivered. | Page. |
|----------------------------------------------------------|--------------------------------------|------------|--------------------------|-------|
| Drainage Scheme                                          | Elham R. S. A.                       | 50 Guineas | Nov. 29th                | ii.   |
| Scheme for dealing with Exhibition Buildings and Grounds | Folkstone Pleasure Gardens Co., Lim. | 50l.       | Not stated               | ii.   |

## CONTRACTS.

| Nature of Work, or Materials.                | By whom required.              | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------|--------------------------------|-----------------------------------|--------------------------|-------|
| Sewering and Making-up Roads, Footpaths, &c. | Beckenham Local Bd.            | G. B. Carlton                     | Nov. 12th                | ii.   |
| Asphalt-making and Paving Works              | Willenden Local Bd.            | O. Claudio Robson                 | Nov. 13th                | ii.   |
| Keeling, Tarpaving, &c.                      | Levinham Bd. of Works          | Official                          | do.                      | xi.   |
| Preparing for and Graveling Footpaths        | Met. Bd. of Works              | Official                          | do.                      | xi.   |
| Well-sinking, &c.                            | Hastings Union                 | P. H. Tree                        | Nov. 15th                | xi.   |
| Welling Rooms at King's Norton               | Midland Railway Co.            | Official                          | do.                      | xi.   |
| Crested Fire Fale Erection                   | North Woolwich Gardens Company | E. R. Gabbett                     | Nov. 16th                | xi.   |
| Underground Urinals, Water Closets, &c.      | Comms of sewers                | Official                          | Nov. 23rd                | ii.   |
| Laying Floors, &c.                           | Central London School District | Pennington & Bridgen              | do.                      | ii.   |
| Making-up Road                               | Beckenham Local Bd.            | H. Jarvis & Son                   | Nov. 26th                | ii.   |
| Refuse Destructor, &c.                       | Chesham Lines Com.             | G. B. Carlton                     | do.                      | ii.   |
| Footway, &c., under Thames, Blackwall.       | Hastings Corporation           | P. H. Palmer                      | Dec. 1st                 | xi.   |
|                                              | Met. Bd. of Works              | Official                          | Dec. 21st                | xi.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom Advertised.  | Salary.    | Applications to be in. | Page. |
|------------------------|----------------------|------------|------------------------|-------|
| Borough Surveyor       | Harrogate Council    | Not stated | Nov. 14th              | xvi.  |
| Surveyor               | Wool Green Local Bd. | 350l.      | Nov. 15th              | xvi.  |
| Accountant Clerk       | Civil Service Com.   | Not stated | Nov. 21st              | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                   |            |
|---------------------------------------------------------------------------------------------------|------------|
| BATTERSEA.—For the erection of a Central Library for the Battersea Public Library Commissioners:— |            |
| Shillites & Son, Bury St. Edmunds                                                                 | 26,169 0 0 |
| M. Marland, Wandsworth, S.W.                                                                      | 5,180 0 0  |
| Longley & Co., Crawley                                                                            | 6,168 0 0  |
| Turtle & Appleton, Wandsworth, S.W.                                                               | 6,144 0 0  |
| Stimpson & Co., Brompton-road, S.W.                                                               | 5,680 0 0  |
| J. & J. Greenwood, Dockhead, S.E.                                                                 | 5,988 0 0  |
| Schatten & Co., Chelsea, S.W.                                                                     | 5,907 0 0  |
| King & Son, Westminster, S.W.                                                                     | 5,995 0 0  |
| W. Smith, Harleyford-road, S.E.                                                                   | 5,990 0 0  |
| Perry & Co., Bow, E.                                                                              | 5,989 0 0  |
| John Allen & Sons, Kilburn, N.W.                                                                  | 5,988 0 0  |
| W. Downs, Walworth, S.E.                                                                          | 5,984 0 0  |
| Alfred Brickell, West Kensington, S.W.                                                            | 5,996 0 0  |
| J. T. Beggall, Finsbury, S.W.                                                                     | 5,999 0 0  |
| B. E. Nightingale, Lambeth                                                                        | 5,970 0 0  |
| Holloway Bros., Queen's-road, Battersea, S.W.                                                     | 5,852 0 0  |
| Charles Wall, Chelsea, S.W.                                                                       | 5,830 0 0  |
| F. & H. F. Higgs, Loughborough Junction, S.E.                                                     | 5,780 0 0  |
| Hart Bros., Dover-street, S.E.                                                                    | 5,739 0 0  |
| W. Johnson, Wandsworth-common                                                                     | 5,700 0 0  |
| J. W. Hobbs & Co., Strand                                                                         | 5,700 0 0  |
| Charles Kynoch & Co., Clapham, S.W.                                                               | 5,645 0 0  |
| James Holloway, Lavender-hill, S.W. (accepted)                                                    | 5,600 0 0  |
| H. Wilcock, Welverhampton                                                                         | 5,580 0 0  |
| George Bor, Hadley, Sussex                                                                        | 5,515 0 0  |
| Brag & Son, St. Luke's, E.C.                                                                      | 5,473 0 0  |
| W. L. Kellaway, Pentonville, N.                                                                   | 5,176 0 0  |
| Ward, Clarke, & Co., New Cross-road, S.E.                                                         | 4,713 0 0  |

|                                                                                                                                                      |           |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| CHESHAM (Bucks).—For the erection of factory, &c., Waterside, Chesham, Bucks, for Mr. Jos Reynolds, Chesham. Mr. Geo. H. Green, architect, Chesham:— |           |
| W. Haddon, Chesham                                                                                                                                   | 4,437 0 0 |
| J. Wright, Chesham                                                                                                                                   | 388 0 0   |
| H. Mead, Chesham                                                                                                                                     | 319 0 0   |
| G. Darlington, Amersham                                                                                                                              | 310 0 0   |
| W. Boughton, Chesham (accepted)                                                                                                                      | 294 0 0   |

|                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------|-----------|
| EASTVILLE.—For warming Eastville New Church, Mr. H. C. Mear, architect, 30, Broad-street, Bristol:— |           |
| John Grundy (accepted)                                                                              | 2,110 0 0 |

|                                                                                                              |            |
|--------------------------------------------------------------------------------------------------------------|------------|
| HACKNEY.—For rebuilding the "Good Intent," Mowlem-street, for Mr. B. Williams. Mr. G. E. Holman, architect:— |            |
| G. Sharpe                                                                                                    | 21,320 0 0 |
| Coulson Bros.                                                                                                | 1,724 0 0  |
| A. Hood                                                                                                      | 1,854 0 0  |
| Alexander                                                                                                    | 1,619 0 0  |
| Edwards, jun.                                                                                                | 1,625 0 0  |

|                                                                                                                              |            |
|------------------------------------------------------------------------------------------------------------------------------|------------|
| FOLKESTONE.—For the erection of a shop and restaurant in Sand at road Folkestone, for M. Carlo Maes, architect, Folkestone:— |            |
| Newman, Folkestone                                                                                                           | 22,750 0 0 |
| Tunbridge, Folkestone                                                                                                        | 2,598 0 0  |
| Meyer, Folkestone                                                                                                            | 2,583 0 0  |
| Prebble, Folkestone                                                                                                          | 2,541 0 0  |
| Pets & Son, Folkestone                                                                                                       | 2,490 0 0  |
| Walls & Clements, Maidstone                                                                                                  | 2,433 0 0  |
| Brooks, Folkestone                                                                                                           | 2,417 0 0  |
| Hayward & Co., Folkestone                                                                                                    | 2,402 0 0  |
| Webster, Folkestone                                                                                                          | 2,400 0 0  |
| Moody, Folkestone                                                                                                            | 2,327 0 0  |
| Franklin, Folkestone (accepted)                                                                                              | 2,298 0 0  |

|                                                                              |           |
|------------------------------------------------------------------------------|-----------|
| HACKNEY.—For building an addition to house in Hackney-road, for Mr. Putney:— |           |
| A. Hood (accepted)                                                           | 2,120 0 0 |

|                                                                                      |           |
|--------------------------------------------------------------------------------------|-----------|
| HACKNEY.—For pulling down and rebuilding No. 73, Mansford street, for Mr. G. Ferne:— |           |
| A. Hood (accepted)                                                                   | 2,245 0 0 |

|                                                                                                                 |            |
|-----------------------------------------------------------------------------------------------------------------|------------|
| HAMMERSMITH.—For pulling down and re-building the "Bell and Anchor" for Mr. W. Brown. Mr. Beaumont, architect:— |            |
| Shao Granite Mansfield                                                                                          | Old        |
| Plasterers                                                                                                      | Stone.     |
| Holloway                                                                                                        | 25,301 0 0 |
| Cox                                                                                                             | 5,120 0 0  |
| Lynn                                                                                                            | 5,110 0 0  |
| Lascelles                                                                                                       | 4,850 0 0  |
| A. Hood                                                                                                         | 4,785 0 0  |
| Turtle & Appleton                                                                                               | 4,339 0 0  |
| Beale                                                                                                           | 4,276 0 0  |

|                                                                                                                                                                                                              |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| ISLINGTON.—For alterations to the "Peacock" public-house, 11, High-street, for Mr. Sturt, Messrs. Wilson, Son, & Aldwinckle, architects, 2, East India-avenue, Leadenhall-street, E.C. Quantities supplied:— |            |
| W. Johnson                                                                                                                                                                                                   | 23,200 0 0 |
| Charles Cox                                                                                                                                                                                                  | 3,057 0 0  |
| Andrew & Nanson                                                                                                                                                                                              | 3,061 0 0  |
| Turtle & Appleton                                                                                                                                                                                            | 2,980 0 0  |
| Heale & Sons                                                                                                                                                                                                 | 2,968 0 0  |
| John Mills                                                                                                                                                                                                   | 2,960 0 0  |
| Jackson & Todd                                                                                                                                                                                               | 2,949 0 0  |
| F. W. Gill & Co.                                                                                                                                                                                             | 2,947 0 0  |
| Staines & Son                                                                                                                                                                                                | 2,934 0 0  |
| Drew & Cadman                                                                                                                                                                                                | 2,916 0 0  |
| W. Shurman (accepted)                                                                                                                                                                                        | 2,590 0 0  |

|                                                                                                                                                                                                                    |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For alterations and additions to the "Royal Standard Music Hall, Finsbury, S.W., for Mr. Richard Wake, Mr. H. I. Newton, architect, 17, Queen Anne's-gate, Westminster, E.C. Quantities by the architect:— |            |
| H. & E. Lea, Regent-street                                                                                                                                                                                         | 23,887 0 0 |
| Kirk & Randall, Woolwich                                                                                                                                                                                           | 3,829 0 0  |
| Perry & Co., Bow                                                                                                                                                                                                   | 3,450 0 0  |
| S. Golden, Bryanston-square                                                                                                                                                                                        | 3,420 0 0  |
| Smith, Son, & Fletcher, Belgrave                                                                                                                                                                                   | 3,357 0 0  |
| H. Burman & Son, Kennington-park                                                                                                                                                                                   | 3,333 0 0  |
| Jackson & Todd, Hackney                                                                                                                                                                                            | 3,300 0 0  |
| J. Beale, Westminster                                                                                                                                                                                              | 3,184 0 0  |

|                                                                                                                                                                                 |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For the erection of business premises, High-street, Camden-town, for Mr. John Matthews. Mr. Edmund J. Bennett, architect, Gravesend. Mr. W. Hawker, quantity surveyor:— |            |
| Wall Bros.                                                                                                                                                                      | 22,968 0 0 |
| Williams & Son                                                                                                                                                                  | 2,945 0 0  |
| Mark Patrick                                                                                                                                                                    | 2,944 0 0  |
| Colls & Son                                                                                                                                                                     | 2,815 0 0  |
| McCormick & Son                                                                                                                                                                 | 2,752 0 0  |
| E. J. Burnand                                                                                                                                                                   | 2,749 0 0  |
| Scrivenor & Co.                                                                                                                                                                 | 2,738 0 0  |
| Tomes                                                                                                                                                                           | 2,549 0 0  |
| Gould & Brand                                                                                                                                                                   | 2,477 0 0  |

|                                                                                                                                                                                                                                                                                                                                |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For the erection of a one-story laundry clothing store, 58 ft. by 22 ft.; a sanitary turret to contain water-closets and fittings; two covered ways, and sanitary roof repairs, for the Guardians of the Poor of Bethnal Green. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities supplied:— |            |
| Jackson & Todd                                                                                                                                                                                                                                                                                                                 | 21,679 0 0 |
| Lake                                                                                                                                                                                                                                                                                                                           | 1,398 0 0  |
| Adams                                                                                                                                                                                                                                                                                                                          | 1,383 0 0  |
| Staines                                                                                                                                                                                                                                                                                                                        | 1,346 0 0  |
| W. Johnson                                                                                                                                                                                                                                                                                                                     | 1,290 0 0  |
| Holland                                                                                                                                                                                                                                                                                                                        | 1,278 0 0  |
| Barrett                                                                                                                                                                                                                                                                                                                        | 1,276 0 0  |
| Sherwood                                                                                                                                                                                                                                                                                                                       | 1,248 0 0  |
| Edwards                                                                                                                                                                                                                                                                                                                        | 1,167 0 0  |
| Barrett                                                                                                                                                                                                                                                                                                                        | 1,191 0 0  |
| George Lusk                                                                                                                                                                                                                                                                                                                    | 1,116 0 0  |
| R. Cox                                                                                                                                                                                                                                                                                                                         | 1,084 0 0  |
| Edmonds                                                                                                                                                                                                                                                                                                                        | 997 10 0   |

|                                                                                     |            |
|-------------------------------------------------------------------------------------|------------|
| LONDON.—For new building, Shaftesbury-avenue, Messrs. W. E. & F. Brown, architects. |            |
| Thos. Bryce                                                                         | 23,583 0 0 |
| Done Bros.                                                                          | 2,355 0 0  |
| Colls & Son                                                                         | 3,194 0 0  |
| E. Lawrence & Sons                                                                  | 2,960 0 0  |
| J. Woodward                                                                         | 2,968 0 0  |
| Langley & Finkham                                                                   | 2,965 0 0  |

|                                                                                                                      |            |
|----------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For alterations and additions to No. 9, Fitzjohn's-avenue, Hampstead. Messrs. W. E. & F. Brown, architects:— |            |
| W. H. Lascelles & Co.                                                                                                | 21,095 0 0 |
| Langdale, Hallett, & Co.                                                                                             | 977 8 0    |
| Langley & Finkham                                                                                                    | 681 16 7   |
| Colls & Son                                                                                                          | 928 0 0    |
| J. Woodward                                                                                                          | 880 0 0    |

|                                                                                                                                                    |            |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For pulling down and rebuilding No. 408, Holloway road, for Mr. H. Dell. Messrs. Scully & Wright, architect, 6, Salisbury-street, Strand:— |            |
| Ward & Lambie (accepted)                                                                                                                           | 21,625 0 0 |

|                                                                                                                          |            |
|--------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For pulling down and rebuilding No. 103, Redmans-road, Stepney, for Mr. Adams. Mr. H. J. Lanchester, architect:— |            |
| A. Hood (accepted)                                                                                                       | 2,358 10 0 |

|                                                                                                                                        |  |
|----------------------------------------------------------------------------------------------------------------------------------------|--|
| LONDON.—For works at 11, Buckingham Palace-road, S.W., for Mr. J. H. Read. Mr. Arthur W. Saville, architect, 36 and 37, Strand, W.C.:— |  |
|----------------------------------------------------------------------------------------------------------------------------------------|--|

|                              |           |
|------------------------------|-----------|
| Alterations and Repairs.     |           |
| Drew & Cadman                | 2,291 0 0 |
| Ward & Lambie                | 233 0 0   |
| Spencer & Co.                | 234 0 0   |
| S. Yardley & Sons (accepted) | 234 0 0   |

|                              |         |
|------------------------------|---------|
| Fittings.                    |         |
| Bowling & Govier             | 235 0 0 |
| S. Howlett                   | 205 0 0 |
| S. Yardley & Sons (accepted) | 170 0 0 |

|                                                                                                                                                                                 |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| LONDON.—For alterations and repairs at "The Robin Hood," Holborn, for Messrs. Deakin & Crimmin. Mr. Arthur W. Saville, architect, 36 and 37, Strand, W.C. Quantities supplied:— |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

|                   |           |
|-------------------|-----------|
| Builders' Work.   |           |
| S. Goddall        | 2,372 0 0 |
| W. A. Rhodes      | 347 0 0   |
| S. Yardley & Sons | 331 0 0   |
| Spencer & Co.     | 325 0 0   |
| Walker (accepted) | 300 0 0   |

|                        |         |
|------------------------|---------|
| Painters' Work.        |         |
| F. J. Ruse             | 249 7 6 |
| Watts & Co. (accepted) | 46 14 0 |

|                                                                                                                                                             |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For various sanitary alterations to 13, Devonshire-place, for Colonel Sir Charles Hamilton, Bart. Mr. F. M. Elgood, architect, 38, Wimpole-street:— |            |
| Clarke & Mannoch (accepted)                                                                                                                                 | 2,139 15 0 |

|                                                                                                                                                                             |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For new drains and various sanitary alterations at No. 4, Gloucester-place, Portman-square, for Mr. A. J. Blount. Mr. F. M. Elgood, architect, 38, Wimpole-street:— |            |
| Smeston, Son, & Co.                                                                                                                                                         | 2,239 19 6 |
| Army and Navy Auxiliary Co.                                                                                                                                                 | 193 0 0    |
| Clarke & Mannoch (accepted)                                                                                                                                                 | 185 0 0    |

|                                                                                                                                          |            |
|------------------------------------------------------------------------------------------------------------------------------------------|------------|
| LONDON.—For new drains and various alterations, &c., at No. 54, Montagu-square, W. Mr. F. M. Elgood, architect, 38, Wimpole-street, W.:— |            |
| Clarke & Mannoch (accepted)                                                                                                              | 2,505 10 0 |

|                                                                                                                                                                            |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| LONDON.—For alterations, additions, and repairs, at No. 28, Queen Anne-street, Portland-place, for Mr. Joseph Mills. Mr. F. M. Elgood, architect, 38, Wimpole-street, W.:— |           |
| General Works.                                                                                                                                                             |           |
| Hall, Reddall, & Co.                                                                                                                                                       | 2,273 0 0 |
| George Shaw                                                                                                                                                                | 442 10 0  |
| J. Simpson & Son                                                                                                                                                           | 417 0 0   |
| Accepted.                                                                                                                                                                  | 30 0 0    |

|                                                                                                                                                                            |           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| LONDON.—For building extra storey and various other alterations and additions to No. 20, Chester-terrace, Regent's Park, Mr. F. M. Elgood, architect, 38, Wimpole-street:— |           |
| Clarke & Mannoch (accepted)                                                                                                                                                | 2,580 0 0 |

|                                                                                                                                |           |
|--------------------------------------------------------------------------------------------------------------------------------|-----------|
| MAIDENHEAD.—For alterations, &c., to Shephoep Cottage, Maidenhead Court. Mr. Frederick Wheeler, architect, 22, Chancery-lane:— |           |
| G. H. Gibson (accepted)                                                                                                        | 2,475 0 0 |

|                                                                                                                      |           |
|----------------------------------------------------------------------------------------------------------------------|-----------|
| MAIDENHEAD.—For the erection of Villa, Maidenhead Court. Mr. Frederick Wheeler, architect, 22, Chancery-lane, W.C.:— |           |
| G. H. Gibson (accepted)                                                                                              | 2,100 0 0 |

**NEWPORT (Mon.).**—For new schools, Spring-gardens, to accommodate 1,000 children, boys, girls, and infants, for the United District School Board. Mr. E. A. Lansdowne, architect, Newport:

|                               |            |
|-------------------------------|------------|
| By Parlett, Cymbran           | £5,900 0 0 |
| J. Inwood, Malvern            | 5,700 0 0  |
| Gradwell, Burton-on-Furness   | 5,631 3 6  |
| J. Linton, Newport            | 5,485 0 0  |
| G. Martin, Newport            | 5,478 0 0  |
| Moulton & Houscome, Newport   | 5,448 0 0  |
| G. Wilkins, Newport           | 5,393 0 0  |
| A. H. Bailey, Pontnewydd      | 5,300 0 0  |
| H. A. Fors, Bristol           | 5,263 0 0  |
| Wm. Price, Newport (accepted) | 5,073 0 0  |

**NEWPORT (Mon.).** For alterations and additions to house, Maindee, for Messrs. Davis Bros. Mr. E. A. Lansdowne, architect:

|                                |          |
|--------------------------------|----------|
| H. C. Parlett, Maindee         | £130 0 0 |
| C. Lock, Newport               | 118 10 0 |
| Piford & Son, Maindee          | 115 10 0 |
| A. Hazell, Newport             | 115 0 0  |
| P. Chapman, Maindee (accepted) | 115 0 0  |

**NEWPORT (Mon.).** For alterations and additions to Endowed School, Cardson, for the Governors. Mr. E. A. Lansdowne, architect:

|                             |          |
|-----------------------------|----------|
| C. Lock, Newport (accepted) | £118 0 0 |
|-----------------------------|----------|

**NEWPORT (Mon.).** For alterations and additions to Endowed Schools, Basavan, for the Governors. Mr. E. A. Lansdowne, architect:

|                           |            |
|---------------------------|------------|
| John Burgoyne, Basavan    | £1,000 0 0 |
| Thomas Foster, Abercromby | 1,050 0 0  |

**RICHMOND (Surrey).**—For additions, &c., to existing contract for rebuilding "Railway Tavern," Mr. Geo. Whitaker, 33a, Broadway, Hammer-smith, W., architect. Quantities by Mr. T. W. Biggs, 5, Shaftesbury-road, W. — Patman & Fotheringham

|                       |           |
|-----------------------|-----------|
| Patman & Fotheringham | £1540 0 0 |
|-----------------------|-----------|

**SOUTHWARK.**—For heating (by warm air) St. Peter's Church, Southwark. Mr. Ewan Christian, architect — John Grundy (accepted)

|                        |          |
|------------------------|----------|
| John Grundy (accepted) | £120 0 0 |
|------------------------|----------|

**STREATHAM.**—For the erection of a residence in Alington-road, Streatham Park, S.W. Mr. Frederick Wheeler, architect, 22, Chiswick-park, W., architect. Messrs. Evans & Denon, 1, Adelaide-street, Charing Cross:

|                 |            |
|-----------------|------------|
| G. Jervis Smith | £2,400 0 0 |
|-----------------|------------|

**STREATHAM.** For alterations to Woodfield, Ambleside-avenue. Mr. Frederick Wheeler, architect: — H. H. Bros.

|             |          |
|-------------|----------|
| H. H. Bros. | £225 0 0 |
|-------------|----------|

**STREATHAM.**—For the erection of stable, Thrall Hall. Geo. Barnes (accepted)

|                        |          |
|------------------------|----------|
| Geo. Barnes (accepted) | £200 0 0 |
|------------------------|----------|

**STREATHAM.**—For alterations to shop premises, High-road. Mr. Frederick Wheeler, architect: — Hill Bros.

|            |          |
|------------|----------|
| Hill Bros. | £294 0 0 |
| Barnes     | 265 0 0  |

**TOOTING.**—For warming St. Nicholas Church, Tooting. Messrs. St. Aubyn & Wadling, architects, Lamb-building, Temple, E.C. — John Grundy, London & Tyldesley (accepted)

|                                            |          |
|--------------------------------------------|----------|
| John Grundy, London & Tyldesley (accepted) | £120 0 0 |
|--------------------------------------------|----------|

**WALTHAMSTOW.**—For the erection of eight houses and a shop at Walthamstow. Mr. Christopher M. Shiner, architect, 15, New Broad-street, E.C. — Rovo

|      |         |
|------|---------|
| Rovo | £1,600* |
|------|---------|

\* Corrected amount: not £1,190 as previously stated.

**WOLVERHAMPTON.**—For the erection of semi-detached villas, Compton-villa. Mr. Joseph Lavender, architect, Wolverhampton. Quantities by the architect: — G. & F. Higham

|                |            |
|----------------|------------|
| G. & F. Higham | £1,270 0 0 |
|----------------|------------|

H. Willcock — Bradley & Co. — J. Jones, Dudley-road\*

|                        |            |
|------------------------|------------|
| H. Willcock            | 1,236 18 0 |
| Bradley & Co.          | 1,180 0 0  |
| J. Jones, Dudley-road* | 1,110 9 0  |

\* Accepted, subject to alterations.

**WORTHING.**—For the restoration of Colonnade House, Warwick-street, after damage by fire. Mr. Alfred Broad, architect, Croydon. Quantities by the architect: — Saunders, Croydon

|                   |          |
|-------------------|----------|
| Saunders, Croydon | £359 0 0 |
|-------------------|----------|

W. Holt, Croydon — A. M. Deacon & Co., Norwood — Smith, Worthing — Savile, Worthing — Smith & Bull, Croydon — J. O. Richardson, Peckham — F. R. Docking, Croydon — Crouch, Worthing (accepted)

|                             |          |
|-----------------------------|----------|
| A. M. Deacon & Co., Norwood | 450 0 0  |
| Smith, Worthing             | 393 0 0  |
| Savile, Worthing            | 391 0 0  |
| Smith & Bull, Croydon       | 373 0 0  |
| J. O. Richardson, Peckham   | 350 0 0  |
| F. R. Docking, Croydon      | 350 0 0  |
| Crouch, Worthing (accepted) | 325 17 0 |

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# The Builder.

Vol. LV. No. 2289.

SATURDAY, NOVEMBER 17, 1899

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### Purbeck Marble and Stone.



THE Isle of Purbeck has been celebrated from time immemorial for the character and beauty of the stone raised within its narrow confines. It is not so well known, perhaps, as it might be, owing chiefly to the circumstance that the attention of quarry-owners in the district is rightly centred in the products of the neighbouring Isle of Portland. Yet this is very far from having always been the case. Long before Portland had begun to rise to the high position it now occupies as a stone-producing island, the stone from Purbeck was, as is very well known, held in high esteem, amongst builders of the Middle Ages especially. The slender shafts and columns, the sepulchral monuments and interior decorations of a like nature, found in many cathedral and other churches in the South of England, all testify to its abundant use from the eleventh to the sixteenth centuries. It was mostly used during that period in a polished state, being known as Purbeck marble. A certain proportion of the shafts in Westminster Abbey are constructed of this material; but, unfortunately, the stone is in a bad state of preservation, having hardly a trace of the original polished surface left. Portions of the Temple Church; the shafts in Lincoln Cathedral; the tomb of William Rufus in Winchester Cathedral; the tombs of Bishop Roger de Mortival and Bishop Poore, the shafts and mouldings of the magnificent new pulpit designed by the late Sir Gilbert Scott, and many minor embellishments in Salisbury Cathedral, are amongst the fine examples of work executed in this marble.

There can be but little doubt, however, that Purbeck is often confounded with the Sussex or Petworth marble. Some of the varieties of this latter so closely resemble the former, that the mistake is quite excusable. It may not be uninteresting, therefore, to briefly describe the salient features of either kind. They are both shelly limestones, nearly the whole of the substance of which they are made being formed of the shells of minute crustaceae, but principally also of the freshwater gastropod known as *Paludina*. This, no less than the collateral evidence afforded by the physical character of the beds in which

the seams of stone are found, proves that they have both been laid down, or formed, in fresh water. The slabs of stone, after being polished, exhibit the *Paludina* cut through in different directions, and this gives a pleasing "pattern" to the marble. The shells are frequently decomposed, their casts alone remaining, the interstices being filled up with calcareous matter. In the coarser varieties, cavities are left by the decomposition and total removal of the shells; but in the compact and more commonly used kinds, the shells are changed into crystalline calcite, and the whole has been permeated and cemented by the same mineral, also in a crystalline form, giving it that degree of hardness by which alone it is rendered capable of receiving a polish. So much for the characters possessed by the stones in common.

The chief distinguishing features are, the different species of *Paludina*, and the tints of the stones; though this latter is only of secondary importance. It is commonly thought that the two kinds of marble may be distinguished from each other in that the species of *Paludina* characterising the Sussex stone is much larger than that of the Purbeck. This is very well in a general sense, but it by no means always applies. The Purbeck *Paludina* are, without exception, comparatively small species, those in the commonest kind of marble being especially so; whereas the Sussex marble *Paludina* are at least of three distinct kinds, two of which (*P. Susseensis* and *P. fluviatilis*) are large, and the other rather small, or about the same size as those common to the Purbeck. We are referring now only to those species of *Paludina* which are important as rock-formers, and which, therefore, materially assist in making up the stone. That kind of Sussex marble formed of the smaller species of *Paludina* is seen at Staplehurst, Frittenden, Idenbourn, and Crowhurst; whilst the others, containing the larger species, are met with near Plaistow and south-east of Chiddingfold, and at Betersden, Petworth, &c., respectively. The last mentioned is the best-known kind of Sussex marble, and, like the Purbeck, is renowned in the annals and history of church architecture. From the foregoing, it will be seen that the only variety of Sussex marble that can possibly be confounded with the Purbeck, is that along the horizon found at Staplehurst, &c.; and in this case the difference in tint somewhat assists, being of a greenish hue. So far as we can learn, it is never pink, like some

varieties of the Purbeck. Moreover, the species of *Paludina* and *cypridea* are different.

Comparatively speaking, the Purbeck marble is not of any importance now-a-days. The stone is polished locally, we are informed; but, from the fact that so much of it weathers badly, and from the competitive influence of the introduction of more highly crystalline home and foreign marbles into the market, its use has very much decreased. As with limestones of this class, however, good and durable beds, capable of being polished, exist. The value of the marble lies principally in its historic associations.

But it is not so much of Purbeck marble as of the stone raised in the island, and used for ordinary building purposes, that we desire now to treat of.

As the visitor approaches Swanage from the sea, the most prominent objects striking his eye are huge stacks of stone piled up in yards, not far from the landing-place. The sound of the hammers and chisels striking the refractory substance, and ringing through the air, bespeak of an industry by no means extinct. Carts laden with the heavy material, drawn by horses, may be seen slowly winding along the roads in the vicinity. We observe that many of the inhabitants are masons; that the "Mowlem Institute" is a well-known establishment; whilst the name of Burt is quite familiar. From these indications we may infer that the stone trade, in spite of the comparative extinction of the marble trade, is yet the principal industry of the place. In most stone-working districts, the quarries whence the material comes are conspicuous, but at Swanage, we only see the hill-sides to the south of the town dotted all over with sheds and small heaps of rubbish. No really large quarries are anywhere to be seen in the vicinity. On ascending the hill-slopes, we find that the stone is obtained by mining, and that the sheds mark the entrances to the mines. We will now briefly describe one of these workings, which may serve as a general guide to the whole.

The entrance to the mine is down an inclined plane at an angle of about 45 deg., the uppermost thirty feet being open, and the remaining portion being tunnelled through the earth to a depth of 100 ft. from the surface. Steps are cut on one side of the track to allow the workmen to descend and ascend. The stone is hauled up the inclined plane on trolleys (after being securely fastened thereto), by means of a chain working on rollers and



wound round a capstan at the surface, the latter being worked by a horse.

There are at least five beds of good workable stone at Swanage:

1. Is known as the "Leaning vein," is 4 ft. to 5 ft. thick, being used principally for curbs, &c. It is a hard, compact, dark-grey, shelly limestone, breaking with a splintery fracture, and seems well adapted to curbing and pitching in towns, where there is not much ordinary traffic. A few cavities exist in the stone, which render it incapable of resisting much heavy wear.

2. Is a white freestone, about 6 ft. to 8 ft. in thickness, largely employed for building in the neighbourhood. It is very hard, full of shells, and altogether a serviceable-looking material for ashlar, &c. The poorer kinds weather into cavities, and, consequently, are not of much permanent value.

3. Known as "Down's vein," from 3 ft. to 3½ ft. thick, is used for paving, &c. It is of a light brown colour, is fine-grained and flags.

4 and 5 are separated from each other only by a foot of earth. They are termed the "cap and feathers" beds, having a total thickness of about 9 ft. The structure of both is practically the same, being medium-grained, bluish grey, shelly limestones, exceedingly hard and compact, and, although they somewhat resemble No. 1 in texture, they do not seem to contain any cavities. They are peculiarly fitted for country pitching and curbing.

As is usually the case with strata laid down in fresh water, or in estuaries, the beds of Purbeck stone vary considerably in thickness,—in some places bulging out, and in others, becoming much attenuated or altogether disappearing. The thicknesses given, therefore, must be taken in a general sense only. From this, and from the circumstance that the beds of stone are naturally so thin, and are usually separated from each other by considerable thicknesses of earth (which it would not pay to remove), the men have to work in a stooping posture. The stone is detached from the parent rock by means of wedges, no explosives of any kind being used, except in making new openings.

The underground drainage is fairly good, because, as a rule, the beds gently incline to the northwards, and there is consequently a natural fall. We are now more particularly referring to the mines quite close to Swanage; farther southwards, these Purbeck beds are considerably twisted and contorted, when such favourable conditions do not often obtain.

We were informed that at least 300 men and boys were employed in "winning" stone round Swanage, Durlstone, and Langton. Very few stone merchants work the mines themselves. The thinness of the stone prevents anything like concentrated labour; and steam machinery is quite out of the question, as the mines, although in the aggregate important enough, are too far apart to permit of its being economically introduced. The mines are conducted by small gangs of men and boys, who mostly work on their own account, and sell the ashlar, curbing, pitching, paving, and roofing to the stone merchants. The state of trade is not very promising, and is certainly not so brisk as it might be,—the universal cry. Swanage Bay, which serves as a harbour to the place, affords good anchorage for vessels of from 300 to 400 tons burthen, and stone can be easily shipped alongside the wooden pier.

The roofs of the older houses in the town are covered with thin slabs of stone made from the more flaggy varieties of the material, which time has covered with moss, and this imparts a quaint and picturesque appearance to the place. The freestone is not at all adapted to outside carving, as may be seen in the public buildings. The weather causes the shelly infiltrations to wear out into cavities, which naturally has the effect of giving the stone a pitted and freckled appearance. In one case, which came under our notice, where there are carvings representing two children over a large doorway, the effect of this weathering is most unpleasing. The better kinds of Purbeck freestone are

good materials to build with, as we have before remarked; but their use is altogether misapplied in any kind of outside carvings or rich embellishments. The more homogeneous varieties of stone only, must be utilised for these purposes.

It is very necessary to build Purbeck stone so that the bedding is either horizontal, or placed in such a position as to prevent the fissile limestone from flaking off from the surface of the building. This materially adds to its durability.

#### THE NEW GERMAN TRADE INSURANCE LAWS.

**T**HERE can be no question that the Foreign Office is doing good service by their publication, at a cheap rate and in convenient form, of reports on subjects of general and commercial interest. But the Office might, we think, take measures for the circulation of these reports. They should be sold at railway bookstalls and at booksellers' shops, and should be advertised so that the public generally might have their attention called to them. We wonder how many farmers have even heard of the Report on Dairy Farms in Denmark.

The Report No. 107, upon which we propose to say something, is not fully explained by its title, because the actual law there translated is preceded by an introduction by Mr. Rennell Rodd, in which he gives an interesting account of the other laws relating to the insurance of working men in Germany. The experiment which is now being tried there is of as much interest to us as to the Germans. It is, says Sir Edward Malet in his covering letter to Lord Salisbury, "a social experiment on a vast scale, which, if it succeeds, will form the most enduring title of the late Emperor William and Prince Bismarck to the gratitude of their countrymen."

Let us see what this "vast experiment" is. In 1883 the first law on the subject was passed, by which working men were compelled to insure against sickness and accident. Paraphratically, we may say that it would be of value if a translation of this law were obtainable in this country, since we are unable to gather from Mr. Rodd's statement to what trades this compulsory insurance by workmen is confined. According to the first report of the Imperial Insurance Office (for 1886), nearly three and a half million workmen were insured, and about £85,000 had been paid in indemnities. Under the Sickness Insurance Law, the relief ceases at the end of thirteen weeks. The main point to notice about this law, however, is that it is a compulsory insurance law, under which, whether he likes it or not, the workman has to put by money against a rainy day. On July 6, 1884, was passed the Accident Insurance Law; by this the compulsory obligation rests on the employer to make provision (in certain trades) against the chance of workmen being injured in their calling. In 1885, the law was considerably extended, so as to cover a much larger class of workmen, and those engaged under the State. In 1887 was passed the law applicable to sailors, of which Mr. Rodd gives a translation—"The insurance of the working-man against old age, and the making provision for his latter years, will be the final development of this principle." To a certain extent the sickness and the accident laws work in with one another, because the relief under the latter does not begin till the thirteen weeks under the former law, to which we have already alluded, have expired. The sickness law is therefore also a limited accident insurance law. In order to work the accident law "the employers throughout the country are grouped together in co-operative associations, according to their respective employments and territorial distribution." These may really be called "companies," for they act much like a limited company in this country. They draw up their own rules, and manage their own finances. These associations, again, can be divided into sections, which are governed by a board, as is the general association. But above all these is the Imperial Insurance Office, brought into existence for the purpose of these new laws.

It is thus more particularly described by Mr. Rodd:—

"It has its seat at Berlin, and is composed of, at least, three permanent members, including the President, and eight non-permanent members. The President and other permanent members are nominated for life by the Emperor at the instance of the Federal Council. Of the eight non-permanent members four are elected by the Federal Council from its own members; two are elected by the Governing Boards of the Associations, and two by the representatives of the class insured (the representatives at the Arbitration Courts), at a special election, held under the directions of the Imperial Insurance Office. A first and second substitute is also to be elected for these and for the members elected by the Board. The office of non-permanent members lasts four years. Other functionaries in the Imperial Insurance Office are nominated by the Imperial Chancellor."

It "initiates the organisation of the associations, supervises the administration, approves their statutes, breaks up associations that have become unmanageable, undertakes the management previous to the election of officers, and acts as a final Court of Appeal in disputed settlements between employers and employed." It is, in fact, the embodiment of parental, or State, power over nominally self-governing bodies.

The sums required for paying indemnities are obtained by an annual assessment of the members, "the share of each being determined by the number of persons they employ, but subject to augmentation if the occupation is of a specially dangerous character." There are also Courts of Arbitration,—at least one for every section. They consist of "a president selected from the official class," and certain representatives elected by employers and employed. The indemnities are paid by orders on the local post-offices.

Incidentally connected with the general scheme are regulations drawn up for the prevention of accidents. These are composed by the associations after consultation with representatives of the workmen, and they must receive the approval of the Imperial Insurance Office.

We have thus, without going into details, given a general outline of the new insurance laws of Germany, framed with the object of preventing working men from becoming paupers through sickness or through accident. At present the system has not been long enough at work to enable a just estimate to be made of its permanent value, which, indeed, will be more fully seen when its further development takes place. Nor have we information before us as to the extent, if any, to which the rate of wages is affected in consequence of this legislation. It is primarily the duty of the workman to lay by money to keep himself alive after an accident. We should take it that if the employer has to find the money the rate of wages would become lower. There are various smaller points also upon which we have no doubt information will be received, such as the effect of illness produced by insobriety. Does such an illness entitle a workman to relief? But it is certain that if the experiment proves successful it will probably,—though in a less complicated form,—be adopted at some future time in this country, and may be the means of solving,—partially at any rate,—one of the most important social problems of our age.

**Manchester Society of Architects.**—The annual dinner of the Manchester Society of Architects took place on Thursday evening, the 8th inst., at the Queen's Hotel. The guests present were Mr. Waterhouse, R.A., President of the Royal Institute of British Architects; Mr. Leader Williams, M. Inst. C.E.; Dr. Ransome, of the Sanitary Association; Mr. Kirby, A.R.I.B.A., President of the Liverpool Architectural Association; and Mr. Leresche, J.P. In the students' competition for the current year the President's prize of five guineas has been awarded to Mr. Stanley Davenport Adshad, who is engaged in the office of Mr. Medland Taylor. For the other prizes, amounting to fifteen guineas, there were no competitors.



## NOTES.

THE "Interim Report" of the Royal Commission on the Board of Works, which will in all probability prove practically to be the only report (as it can hardly be worth while reporting again on a corporation so soon to become extinct), does not present anything of new or special interest in regard to the subject, as it merely puts into an official form the conclusions which every one who paid any attention to the evidence must have come to already. The severest condemnation of the Commissioners is, of course, directed against the most flagrant offenders, Goddard and Robertson. In regard to the two architect members of the Board, while the Commissioners strongly censure their conduct in certain cases (the substance of the evidence in regard to which has appeared in our columns), and while they "think it clear that the employment of Saunders as architect (to the London Pavilion) was forced upon Villiers, much against his will," they think it fair to Mr. Fowler and Mr. Saunders to say that "there is no evidence that in general the fact that they were professionally employed induced them to take, or abstain from taking, a course at the Board other than that which they would have pursued had they not been so employed." It was only for some comparatively small gains in some instances that these persons sacrificed what ought to have been their standard of professional honour and duty; and they have probably not found the result satisfactory. In regard to Mr. Hebb's theatrical transactions, the Commissioners use almost the very words we used, that they would have been disposed to pass over the matter lightly had not Mr. Hebb persisted in denying that he had done anything wrong. As it is, they "feel bound to express in unequivocal terms their sense of the impropriety of Mr. Hebb's conduct"; but they add that there is no evidence that he misused his position in any other way, and they entirely acquit him of any corrupt motives in regard to the matter of the line of frontage at Brixton Rise; an opinion in which we fully concur; it seems to have been an error of judgment, but nothing more. The most important conclusion comes to be the Commissioners is that embodied in paragraph 94 of the Report, which we reprint verbatim:—

"In view of the facts elicited by this inquiry, we think it might have a wholesome effect if it were distinctly made a criminal offence to offer to any member or official of a public body any kind of payment, fee, or reward, having any relation to the affairs of the body of which he was such member or official, and also to make the person accepting any such payment, fee, or reward amenable to the criminal law. We are not, of course, professing to define the terms of such an enactment, or the exact form which it should take, nor the nature of the penalties to which the offenders should be made liable. But we think the provisions of the Corrupt Practices Acts would afford some useful suggestions in framing such an enactment."

WE regret to see that Mr. Perkin, the President of the Leeds and Yorkshire Architectural Society, in his opening address, has returned to the old fallacy of encouraging provincial societies to set themselves against the Institute, on the ground (this time) that the Institute considers that membership of its own body, obtained through the efficient compulsory examination to be now instituted, is a better and more suitable form of guarantee of professional proficiency than could be obtained by a diploma, and avoids the difficulties which would beset the granting of a diploma for a profession which is, to a great extent, an artistic one. The opinion on this subject of the present President of the Institute, a man universally respected both professionally and personally, ought certainly to have some weight, and ought to evoke some loyalty of support; but, instead of that, the first thing some people seem to think of is to do any thing that may be in their power to weaken his hands. As a member of the Institution of Civil Engineers remarked to us, in reference to the abortive Registration

Bill, "It is the disunion of you architects that has caused all this trouble"; and the charge is only too true. Mr. Perkin argues that the influence of the Institute is too limited to guard the entrance to the profession from unqualified practitioners. It is not so limited, perhaps, as he thinks; and it is likely to become less so as the fact of its compulsory entrance examination becomes known to the public; but, so far as it is "limited," whose fault is that? Mainly the fault of those who refuse to act in concert with the central body. The adherence of all architects to a central representative body would enable that body to efficiently control the standard of professional attainment, as the Institution of Civil Engineers does actually control the standard of the engineering profession (even without an entrance examination), because the engineers are a loyal and united body among themselves, and the architects are not; and, so far as the influence of the Institute of Architects is limited, this is owing to the disloyal and disruptive policy of the very men who criticise its action.

WE give in another column a brief résumé of the evidence so far given as to the fall of the houses in Great Fitchfield-street, by which six lives have been lost. The inquest is adjourned for some days. Pending this, we of course decline at present to express any opinion as to the probable cause of the accident, and where the blame is to be laid; though we have our own opinion on the subject, so far as we can judge from the ruins, and without having seen the plans.

THE case of Harding v. The Guardians of the City of London Union, which was tried last week before Mr. Justice Grantham, must not, we think, be taken to decide on principle that a building owner is entitled to retain the amount due to a quantity surveyor, and not to hand it over to the builder who claims it, in order to pay the quantity surveyor. In the case in question, the plaintiff claimed, as the trustee in bankruptcy of a builder, the balance due under a contract between the builder and the building owner to a quantity surveyor for his charges. The building owner had, in fact, paid his charges directly to the quantity surveyor, but it was argued that the builder, or, as in this case, his trustee, was entitled to obtain the money from the building owner, not necessarily to pay over to the surveyor, but to retain as part of his estate, the quantity surveyor claiming against it in the bankruptcy. Mr. Justice Grantham decided that the building owner was entitled under the circumstances to pay the quantity surveyor himself. We say that this case does not settle any principle, because it seems clear that the ground of the claim was for money primarily due to another person than the builder. At the most, the builder was no more than a trustee for the quantity surveyor, and so, if the latter had already received the money, there was clearly no equitable right in the builder or his trustee to claim the money on behalf of a man who had been already paid. If the building owner had not already paid the quantity surveyor, it seems possible that the trustee might have in that case claimed the money. Perhaps when the judgment is perused in full, it may throw more light on this interesting point.

THOSE of our readers who are interested in the Belgian Water-supply Competition,\* may like to know that a communication has recently been made to the "Société Belge de Géologie" by M. Ch. Van Mierlo, on the water-supply of Ostend. He states that the water at present utilised in that city is rain collected in cisterns, and from artesian wells, neither of which is good or abundant. He reviews and criticises the three schemes which have been brought forward to give a better supply, which consist in (1) the filtration of the water of the Bruges Canal taken at Jabbeke, (2) the drainage of Wynendale

Hill near Thourout, and (3) the drainage of the dunes between Nieupoort and La Panne. The first-mentioned project is somewhat like the method by which Antwerp is at present supplied. This city draws its water from the River Nethe, near Waelhem, the fluid passing through spongy-iron filters before being used. M. Van Mierlo, however, does not favour the Bruges Canal scheme for supplying Ostend, because chemical analyses have shown that the water in the canal, after being filtered, is unfit to drink. In regard to the second project mentioned, he points out that the conditions are favourable to efficient filtration, inasmuch as rain-water, in falling on the hills, passes through sand until it reaches the impermeable Panisliën clay underneath; but it is questionable whether the quantity required,—5,000 cubic metres per day,—would be forthcoming, because the collecting ground is so limited. Besides, as long canals would have to be constructed, it would be too costly. The author thinks the third-mentioned scheme, that of obtaining the water from the dunes, is the most practicable. The sands of these dunes repose on clayey alluvium, which plays the rôle of an impermeable bed, holding up the rain-water which has passed through the overlying sands. The surface of the clay is slightly inclined, which causes a natural running of the water, which could be taken at its lowest levels by drainage tunnels in the usual way. The quantity of water obtainable by this method would be sufficient to supply both Nieupoort and Ostend, and the abstraction of the water from its natural sources will not in any way affect the growth of plantations in the district. In regard to expense, he says that the last-mentioned project would give the best water, at the same price as the Bruges Canal scheme; whilst it gives more water at a lower price than would the drainage of Wynendale Hill. We may mention that the cities of Amsterdam, Haarlem, Helder, Leyden, and the Hague are all supplied with water from sand-dunes after the manner projected for Ostend and Nieupoort; but the thickness of the sand in Holland is greater than in Belgium, so that in the former country greater natural facilities exist for retaining water in the dunes,—an important consideration in a scheme of this kind.

IN the course of the Report of the Commission on the Board of Works, reference is made to the desirability of some provision being made for an appeal from the certificate of the Board's Architect fixing the line of building frontage, and a letter from Mr. Blashill is printed, proposing the appointment of a tribunal consisting of three architects or surveyors, of whom one should be appointed by the Institute of Architects, and one by the Institution of Surveyors. Mr. Blashill adds:—

"The selection of the third member of the tribunal remains to be considered. It is highly important that the Superintending Architect, whose experience in these cases will be constant and considerable, should be able to bring before the tribunal the principles upon which the definitions have been based. It is also important that he should be familiar with the views of the tribunal, as his definitions will be influenced by it in future cases. I, therefore, consider that he should be the third member of the tribunal, whose decisions should be made by the three members, or any two of them, as is laid down by section 85 of the Metropolitan Building Act, 1855, in the case of surveyors appointed to settle differences as to party walls."

The Commissioners entirely dissent from this suggestion of making the Superintending Architect a member of the tribunal of appeal from his own decision, and we are of the same mind. The tribunal of appeal could always hear and consider the statement of facts by the Superintending Architect. The appeal tribunal should be entirely independent of the official authority. This subject will probably have to be considered in some form when the direction of buildings in London is taken over by the County Council; and therefore it is important that the right principle of dealing with it should be considered. Mr. Blashill's letter contains also the following brief classification of the cases in

\* See the Builder, vol. iv., pp. 295-6 (April 28, 1888), and p. 318 ante.



regard to frontage line, which have come up before the Board of Works (at the rate of about twenty-four a year), which may be of interest:—

"They arise as follows:—

1. Upon the request of an owner who desires to know the general line in reference to his intended building.
2. Upon the request of any neighbour who may consider his property injuriously affected by the proposed building.
3. Upon the request of a parish or local board, which request is usually made with the view of taking proceedings against the building owner.
4. Upon the request of the Metropolitan Board of Works made in cases when it considers that, without its intervention, buildings may be improperly erected."

THE talk of the hour in Italian parliamentary circles at Rome is the competition for the new Houses of Parliament for the Italian legislative body, for which designs have just been publicly invited. It was proposed some time ago to acquire the Palazzo Chigi, in the Piazza Colonna, for the purpose; but the site has now been definitely fixed in the Via Nazionale, in the Piazza Magna Napoli, not far from Trajan's Forum. The competition for the proposed buildings is open only to Italian architects, a condition being that the new palace is to have three large meeting-halls. One of these is intended for the Senate, and is to contain seats for 250 Senators; the second, for the Deputies, will provide seating for 508 members; the third, finally, will be reserved for State occasions, and have an area of about 7,500 square feet. Three separate entrances are to be provided for the two Houses and the public respectively. All three halls will have galleries for the Court, the diplomatic body, members of Parliament and Senators, and the general public, as well as large lobbies. The author of the accepted design is to be entrusted with its execution, provided he accepts the conditions and terms of remuneration of the Italian Government. In case an agreement is not arrived at, he will receive a prize of 100,000 lire (4,000*l.*), but his plans become national property. The committee which has to decide on the selection of the designs will have placed at its disposal a sum of 25,000 lire (1,000*l.*), to be divided amongst the authors of the five next best designs. All plans must be deposited by October 31, 1889.

FROM a correspondence which has lately taken place between the Chairman of the Hornsey Local Board (Mr. H. R. Williams) and the Vestry Clerk of Islington, Mr. W. F. Dewey, it appears that a serious dispute has arisen between those two bodies as to the terms of an agreement which had been arrived at by them for the rebuilding and widening of the Highgate Archway. We have carefully perused the correspondence, which certainly seems to show that the Islington Vestry will be seriously to blame if this much-needed improvement be not carried out at once. Everything appears to have been settled between the two authorities, subject to the Tramway Company obtaining their Act, and to the necessary land for the widening of the Archway being acquired by the Vestry and the Board in their respective parishes. Mr. De Courcy Meade, the surveyor to the Hornsey Local Board, has completed the plans for the work, and the Board has obtained the requisite land on its own side of the Archway. The Islington Vestry, it appears, have recently acquired the necessary land in their parish, at a cost of about 1,000*l.* This sum, they now say, is greater than they anticipated, and, consequently, they threaten to go back from their agreement with the Hornsey Local Board, and thus to postpone the matter indefinitely, unless Hornsey will undertake to reduce the cost of the work by between 3,000*l.* and 4,000*l.*, or, in other words, to include the cost of retaining walls (one of which it was agreed should be built at the cost of the Islington Vestry) in the agreed cost of the archway structure, viz., 9,000*l.* We hear that the inhabitants of Holloway are about to hold a meeting protesting against the action of the Islington Vestry in delaying

this desirable improvement after having undertaken to co-operate on equitable terms in its execution.

IT appears that in addition to the uncertainty of being able to communicate with the guards on our railways (to which allusion was made by us in our issue of October 27), the unlucky traveller has no assurance that the signal of distress will receive attention even when it is noticed. In the very first reference that we have seen to such communications since last writing upon the subject, the guard admitted that he heard the signal, but said that as the train was then approaching a station at which it was to stop, he did not think it necessary to have the train pulled up. This occurred on the Brighton line, the case being made public on account of the passenger being summoned at the Wandsworth Police-court on Tuesday last for "unlawfully making use of the means of communication without reasonable or sufficient excuse." After hearing the evidence, which was very contradictory, and into which we need not enter,—the magistrate dismissed the summons, but remarked very strongly upon the conduct of the guard. He observed that it is obvious that the apparatus is meant to be used only in cases of extreme emergency, so that the train might be pulled up at once and assistance rendered; and that to delay stopping the train until it reached the station might have been to decide a matter of life or death. We entirely coincide with these remarks, and are extremely surprised that we should so soon have occasion to enter another protest against the conduct of railway officials on this head.

AT Nuremberg has just occurred the very unusual case of a refusal on the part of the magistrates to sanction a builder's application, "on aesthetic grounds." It appears that a small angle turret was to be added to an existing building, and it was the opinion of the city authorities that this turret would spoil not only the appearance of the house itself, but that of the whole street: refused accordingly. As, however, the plans were prepared by a leading Nuremberg architect, who is, presumably, able to defend his own design "on aesthetic grounds," and thus prove that there is another side to the question, the case is likely to engage the attention of the higher courts.

THE "Quatuor Coronati" Lodge of Freemasons, membership of which is restricted to those brethren who possess either literary or artistic qualifications, have just elected, as the Master of this Lodge, Mr. W. Simpson, who has acquired a world-wide reputation as a special artist for the *Illustrated London News*, and has also turned his extensive travels to account in the study of out-of-the-way architectural remains, on which he has read several papers of interest before the Institute of Artists. Among the members of the Lodge are Professor Hayter Lewis and Mr. Walter Besant.

THE District Government of the Rhine Provinces having asked the Society of Rhenish and Westphalian architects to give its opinion as to a proposed monument to the late Emperor William, the reply, just published, is to the effect that it is undesirable to place it in a city,—a decision which probably avoided much local jealousy,—but out in the open country, if possible upon some prominent hill; and they further advise the expenditure of about 40,000*l.* for this purpose. Apropos of kingly monuments, the very successful statue of the late Emperor, originally modelled by Professor Baerwald for the City of Posen, has now been erected in replica in two other places, namely, at Altenberg and at Greiz. It is rightly pointed out in the German press that such replicas are a mistake; that if funds do not admit of an original statue, the memory of the first William would be more honoured by a bust upon a pedestal, or even by a medalion upon the wall of a public building, than by the constant repetition of the same design.

AFTER varied fortunes, Scott Russell's big ship, which was at first known as the *Leviathan*, is about to be placed in the hands of the "wreckers." The *Great Eastern* now lies off New Ferry Pier, at Liverpool. On November 20-22 current, a sale at auction will be held (on board) of all the iron-work, boilers, engines, machinery, &c., together with the rigging, spars, cordage, cables, and other equipments. This vessel, designed for a company by Brunel, and built by Scott Russell, was launched, or rather forced, by hydraulic power, into the Thames sideways, from the Isle of Dogs, in 1858. The operations extended over some time, and her progress was measured by inches. Mr. Scott Russell, who died at Ventnor in June, 1882, aged seventy-four, had been a member of a leading firm in the iron ship-building trade, and as an advocate of armour-clad men-of-war was a co-designer of the first vessel of the latter kind,—the frigate *Warrior*, which, if our memory serves us aright, was fitted out at the Victoria Docks, below Blackwall. The project to which we adverted on April 26, 1884, of converting the *Great Eastern* into a coal-hulk in Gibraltar Bay, was not realised, and on October 28, 1885, she was sold, under order of the Court of Chancery, at Lloyd's Captains' Room, and bought by Mr. F. de Mattos for 26,000*l.*, having been withdrawn from a similar sale, in 1881, at an offer of 30,000*l.* When lying in the Clyde last December the ship was purchased by a firm of metal-brokers for the sum of 16,500*l.* In 1865 she laid the first cable from Valencia to America. This broken cable she took up and repaired, laying another in the following year; and she was subsequently employed by a French company on a like duty. Her dimensions are:—Length, 679.6 ft.; breadth, 82.8 ft.; depth, 60 ft.; tonnage, 22,927 tons, builders' measurement. James Watt & Co., of Birmingham, constructed the screw engines, of 1,600 h.p. nominal; the paddle-engines, 1,000 h.p. nominal, were made by Scott Russell & Co. A model of the latter was deposited in the South Kensington (Patent) Museum. 10,000 tons of iron and 3,000,000 rivets (100 to each plate) were used in her construction.

YET another explosive, following closely after the recently-invented Roburite, has been introduced to the notice of English scientific men. The new agent is christened by the appropriate name of "Bellite." It is the invention of Mr. Carl Launn, of the Rolibro Explosives Company, Stockholm, and promises to become a formidable rival even to dynamite. A series of comparative trials between dynamite and the new explosive was instituted on the first of the present month at Middlesbrough. The trials demonstrated that bellite is safer to handle, and slower in action, but possesses more extensive power of destruction than dynamite. Two very conclusive experiments proved its absolute safety under concussion. The fall of a weight of half a ton from a height of 20 ft. upon a number of naked bellite cartridges laid upon an iron plate failed to produce an explosion, or, indeed, any effect beyond the crushing of the cartridges, and the indenting of the plate. Again, the ignition of 1 lb. of blasting powder, in a packet of these cartridges, merely scattered them about, not producing their explosion. We are, therefore, quite able to believe the statement that the Swedish railways carry bellite as ordinary merchandise. The competitive trials between dynamite and bellite demonstrated the greater local energy of the former, but the more extensive action of the latter. Two ounces of bellite tore and twisted a 3-in. wrought-iron plate like paper, while the same quantity of dynamite pierced a comparatively clean hole. Four ounces of bellite, exploded on a 70-lb. rail, made a gap 22 in. long, and split the web of the rail beyond. The same quantity of dynamite produced a gap of about 18 in. only, with scarcely any fracture beyond. Three pounds of bellite were exploded at a depth of 4 ft. underground, and sent the earth up to a height of more than 100 ft., making a cavity of 11 ft. in diameter,



and nearly as deep. The same quantity of gunpowder threw the earth up about 25 ft., leaving only a small hole. Thrown on the fire, bellite fuses and burns without violence. The new explosive consists of 5 parts by weight of nitrate of ammonia, and 1 part of di- or tri-nitrobenzole. It can be fired only by means of a detonating cap, is flameless, and gives off no offensive gas. The trials at Middlesbrough appear to justify the anticipation that bellite will presently come into extensive use in blasting operations.

WE have received from Mr. L. H. Lefevre a copy of a large and careful etching of the Tower of London by Mr. Laurence B. Phillips, apparently designed more as a correct architectural representation than as a piece of effect in etching. The Tower-garden trees in the foreground, however, are well introduced so as to give, by their dark masses, relief and light to the building beyond, and the whole forms a fine representation of the Tower, all the more satisfactory as it is taken from a point of view which does not include the shantique additions lately added under the direction of the Office of Works, and which we observe are still in progress, a massive wall and a large "Medieval" gateway being now in course of construction on the site from which the modern warehouses were removed.

THE exhibition of the Institute of Painters in Oil Colours contains, as usual, a good many good things, some oddities, and a good deal of commonplace. The President's contribution, a portrait-group of two young girls, "Maud and May" (250), one with a violin and one seated at the piano, may be called "a study in reds," powerful enough in colour, but unfortunate in the fact that the feet of the standing figure are out of the picture, the frame cutting off her legs just below the frock, and giving the impression of representing a dwarf. Mr. Dollman's much-praised little work, "Vols. I, II, and III." (357), three girls reading, shows real humour, but is hard and rather inharmonious in colour. Two bust portraits by Mr. Shannon, "Mrs. White" (10) and "Miss Nichols" (431), are beautiful in colour, expression, and a soft breadth of execution. In contradistinction to these, Mr. Herman Herkomer's half-length portrait of "Miss Margaret Jex-Blake" (577) is a very forcibly-painted portrait of the realistic order. Mr. Arthur Hacker's "Children's Prayer" (537), a fine work in some respects, misses its mark rather, owing to the common and inexpressive face of the mother. In "Corked!" Mr. Denny Sadler paints again two of those *bon vivants* of the early part of the century, whom we saw in the Academy discussing their port in an inn-garden. The character of the figures (and costumes) is admirable, but there is a want of the feeling of open-air about it. Mr. Frank Dadd's "Awaiting Sentence" (265), where a little boy, caught stealing apples, is brought into the vicarage dining-room by the gardener, is admirable in every sense; in the quiet humour of the whole, the character in each figure, and the thorough execution of every detail. Among other figure-pictures a little very highly-finished collection of small figures, by Miss Beatrice Meyer (whose work of this kind we specially noticed last year), "The Future Princess" (304), is one of the best things in the gallery—an interior in which we might fancy Mozart at the old-fashioned piano, and Aloysia Weber trying her *scena* before the family circle. Mr. Stock's "Sin piercing the heart of Love" (690) we fear is an ambitious failure, giving the artist all credit for being ambitious. Good landscapes are in larger proportion than good figure pictures. Among them may be named Mr. Fraser's "Lobster Catchers" (32); it is to be hoped his boatmen know their ground well, for they are knocking about among some awkward-looking reefs; Mr. Adrian Stokes's "On the Cornish Towns" (86); what is a "Towan"?), a remarkable bit of sunlight effect; Mr. C. E. Johnson's "Ripe for the Sickle" (120), rather "painty" in the foreground, but with a grand hill in the background; Mr. Cotman's "St. Ives, Evening"

(158), a fine effect and very like the place; "Flooded Glebe" (240), by the same artist; Mr. Thos. Collier's "Mountains at the Source of the Lledr" (247), one of his fine examples of the old broad school of landscape painting, of which David Cox was the great apostle; "A Bright October Day" (330), among sandhills, by Mr. A. Helelé; "Trevetho, Cornwall" (348), by Mr. Alfred East, who also contributes a still finer work, "Evening after a Storm" (426), to which, by the way, the wrong title is given in the catalogue illustrations; "A Garden in Winter" (438), by Mr. Frank Dillon; "Moonlight through Ilex Trees" (468), by Mr. Arthur Severn, one of the finest and most successful of the studies of special effects which he often contributes, with the moonlit water glittering between the dark stems of the trees; "Where Autumn tints imbrown the arching Woods" (531), by Mr. Keeley Halswelle, an example of the old Academic school of landscape,—*passé*, but good of its kind; "Moonrise" (567), by Mr. Alexander Harrison, a very successful attempt to paint sea touched by moonlight; and "On the Sussex Downs" by Mr. Wimperis. Among various bits of "still life" may be mentioned "Apples" (479), by Mr. H. M. Livens, and "My Grandfather's Punch-ladle" (252), by Miss Edith Stock. Among the figure pictures, we should not have passed over Mr. Fred Morgan's "Tired Gleaners" (313), a pretty idyll.

WE learn that notice has been given by the Executive Committee of the Royal Tapestry Works at Old Windsor to the remaining employes (the French contingent having taken their departure some months ago) that their services are no longer required. This ancient industry was revived at Windsor fourteen years ago under the patronage of the late Duke of Albany. A block of cottage buildings, built of red brick in the revived Queen Anne style, constituted the works, which, together with the dwelling-houses and grounds, cover about seven acres—the land being the property of the Crown. In the large hall or principal workroom is a carved stone mantelpiece, said to have been removed from Battle Abbey, and presented to the works by Lord Brassey. The enterprise was managed by the following committee of gentlemen, and who also formed a guarantee fund:—Mr. John Coleridge Kennard, Sir Richard Wallace, Bart., Sir Robert Collins, Mr. Henry Hucks Gibbs, Mr. Anthony Gibbs, Lord Brassey, and Sir Albert Sassoon. The venture has not been a success, and the losses are roughly estimated at 60,000*l.*, while the stock of tapestry and the suite of furniture on hand is valued at 7,000*l.*. Such an end of a well-meant undertaking is rather melancholy, but we fear that the failure may be partly ascribed to a want of perception, on the part of the management, of the true scope and objects of tapestry art. When we hear that "one of the most beautiful specimens" of work produced was "an elaborate view of Windsor Castle," it is pretty evident that the designers and makers were quite at sea as to the objects to be aimed at in tapestry work. Scenic landscape in tapestry is little better than a vulgar gewgaw; the proper object of the art is the production of conventional decorative design. Thanks to the teaching of Mr. William Morris and others, the best-educated section of the public are beginning to understand this now, and would no more hang up a tapestry landscape than they would lay down one of the old-fashioned carpets with huge naturalistic flowers sprawling over them. It is said that the manager and apprentices have petitioned the Committee to be allowed to carry on the work. If so, let them take advice from those who are competent to give it, and reform their style of design, and they will have, perhaps, a better chance of success than in the past.

THE Carleton School Board appear to have "beaten the record" in their demands from competing architects in the competition for Lotherdale School, particulars of which are before us. For a premium of £20, plans

are to be accompanied by specifications and detailed bills of quantities. "The architect whose plans, &c., may be first chosen by the Board must make such alterations in the same as may be required by the School Board, and, at his own cost and risk, submit the same for and obtain the approval of the Department before he becomes entitled to the premium." Any plans, &c., which may be selected by the Board and approved of by the Department, and for which the premium of £20 may have been paid, "shall become the sole property of the Board, and may be used in any way the Board may elect without any restriction whatever." This is a new advance in the endeavour to fleece the profession through the medium of competitions. It only remains now for the Committee to ask that full-size detail drawings for the whole building and the school fittings should be thrown in, as an extra trifle of accommodation on the part of the architect.

#### OLD SITES AND PROJECTED IMPROVEMENTS.

Et, ubi fata vocant, ulis abjectus in berbis,  
Ad vada Mæandri concinit abus oliv.  
Ovid, Heroides, vii. 1-2.

HAVING considered upon the requirements and existing available resources of certain areas in Whitechapel (Bell-lane and Great Pearl-street), Greenwich (Horseferry-road), and Shoreditch, the Metropolitan Board of Works, at their meeting on Oct. 19 last, resolved that it was at present inexpedient to prepare any schemes in connexion with those sites under the Artisans' Dwellings Improvement Acts. They further agreed, on Nov. 9, not to remove the block between Bozier's-court and the southern end of Tottenham-court-road. On the other hand, the Board are minded, clearly, not to relinquish office without setting their mark upon additional projects for metropolitan improvement. Whilst they cannot expect to see these, their last measures in that direction, fairly taken in hand, they may at least claim the merit of their inception. Assuming, *pro forma*, that they will still be in office, they decided to apply to Parliament in the forthcoming session for powers to carry out three extensive improvements. These relate to (1) the widening of Mare-street, Hackney, between Paragon-road and the North London Railway Station, at an estimated net cost of 167,000*l.*; (2) the widening of Old Brompton-road (here known rather as Old Brompton) from Cranley-place to South Kensington Station, the Kensington Vestry do bear one moiety of the cost, which is calculated at 46,000*l.*, exclusively of the works; and (3) the widening of Kensington High-street, between the parish church and Palace-gardens, at an estimated net cost of 169,500*l.* It will be remembered, perhaps, that of late years so much of this last-named main thoroughfare as lies westward of the church,—that is to say, between the police-station and the end of Horton-street, on the northern side,—has been dealt with in the same manner. The front of the old Charity Schools, of date 1713, as designed by Sir John Vanbrugh, with its two quaint figures of a boy and girl, was pulled down for the new Town Hall. A view of the Schools forms a frontispiece of Faulkner's "History" of the parish, 1820. The original design had a curious square central tower,—in two tiers, with angular buttresses, circular-headed openings for the bell and a top pediment,—which rose from the central second-floor window-head. The figures, in the costume of the day, have been removed to the new buildings at the rear. The school-house was enlarged in 1817-8, and latterly served for a Savings-bank. The Town-hall was built after the designs of Mr. Robert Walker, 1878-80.\* The site taken included the National Schools and Nos. 11-14, Church-court, and alone cost nearly 7,000*l.* The former vestry-hall adjoining was rebuilt, in the Jacobean manner, by Mr. Broadbridge, in 1852, instead of the room by the parish church. Of that hall we published a woodcut on June 12, 1852. The parish church was rebuilt by the late Sir G. G. Scott (see our illustration, with a plan, of Jan. 1, 1870).

To demolish the houses which constitute the northern side of Kensington High-street, eastward, will give a *coup de grâce* to this particular

\* Lord Kensington laid the foundation stone on Dec. 12, 1878; opened on Nov. 7, 1890, by her Royal Highness the Duchess of Teck.



portion of old Kensington, which is gradually vanishing away. Most conspicuous amongst the four or five blocks—clearly set out in Roque's map of 1750—are the butcher's large shop, Nos. 18 and 20; the "King's Arms" tavern and hotel, hard by the Palace Gates,\* which, if we are not mistaken, suffered grievously by a fire on June 10, 1857; and the "Civet Cat," at the western corner, by Church-street. At the rear stand some old tenements by names of Clarence-place, leading to the Wesleyan chapel; Brown's-buildings, and Cumberland-yard, alongside of the "Duke of Cumberland." According to Bacon's large scale map of 1880 the boundary of St. Margaret, Westminster, parish passes, north and south, between the Wesleyan chapel (west) and Brown's-buildings (east), and so, by a return eastwards along the northern side of High-street, includes the rest of the buildings under review.

This, our generation, has witnessed a gradual disappearance of certain premises which ranged along the other side of the street. We retain a vivid memory of the tournament and other sports in Batty's Hippodrome. Its arena, open to the sky, lay between the old "Warren," or "Rookery," and what is now Prince of Wales-terrace. The "Warren" comprised New-court, Jennings'-buildings, Cooper's-gardens, and Palace-place, whose denizens were wont to congregate in the "Tavern-yard." Those squalid and overcrowded habitations, together with the miser Sir John Colby's house, *temp.* George I., and its neighbour, Old Kensington House,—home of Louise de Querouaille, Duchess of Portsmouth, ancestress of the Dukes of Richmond; of the schoolmaster, James Elphinstone, the translator of Martial, and friend of Samuel Johnson; and of Mrs. Inchbald in 1819-21; all these premises were cleared away in 1872-3 to make room for that other Kensington House, which Mr. Albert Grant caused to be erected for himself, by Mr. James Knowles, architect, on a site about 7½ acres in extent, and at a total cost of it is said nearly 275,000*l.* We gave a full description of the mansion in our columns of July 8, 1876 (xxxiv. No. 1744). In Macnevin's edition of R. L. Shiel's speeches, with a memoir, &c. (1845), will be found an interesting account of the school which was kept in the former Kensington House by the Jesuit Pères de la Foi, under M. le Prince de Broglie, who had Shiel and Charles X., King of France, for his pupils. It afterwards became a Catholic boarding-house, where lodged the Cosways for a few months, and during the last two years of her life, Mrs. Inchbald. Her death, in her sixty-eighth year, is reputed to have been accelerated by tight-lacing. Colby House, built in 1720, over against the Palace gates, had a centre and two wings, two storeys high. Mr. Albert Grant never occupied his lordly pleasure-house. Having been twice bought in at auction, it was ultimately sold in lots in June and in September, 1882, realising a total of 9,900*l.* The white marble grand staircase, that reached up to the second floor, and cost 11,000*l.*, was bought for 1,000 guineas by the firm of Madame Tussaud & Sons, who have set up that thereof, with the four caryatides of heroic size, in their new rooms in Marylebone-road. Similar adornments, all being upon a most lavish scale, sold for correspondingly small sums. The gilt cast-iron railing, fronting the street, for instance, which cost 3,500*l.*, was purchased at 300 guineas by the Sandown Park race committee.

So passed away this second, but inglorious, Kensington House. The ground it covered was speedily appropriated. The London and County Bank removed from No. 67, High-street, into some premises, on the site of Colby House, which were erected in 1885 from the designs of Mr. Alfred Williams, architect. The remaining portion of Mr. Grant's property was acquired by Mr. J. T. Carr, who laid out the estate for the several blocks of seventy-five houses, in all, which are known as Kensington-court. Amongst the architects employed we may mention Mr. J. J. Stevenson and Mr. T. G. Jackson; and, of the later date, Messrs. Perry and Reed.

Between Nos. 61 and 63, High-street, is Young-street, so-called after its builder, who also built much of Kensington-square, in the reigns of James II. and William III. At No. 13 (since 16), during the interval 1847-53, lived Thackeray, whose "Esmond," written in that bay-windowed house, justly makes him the *vates sacer* of the neighbouring Kensington-

\* Sir C. Bigot's water-colour, of circa 1848, in the British Museum.

We illustrated Mr. Jackson's design on June 27, 1885; Mr. Williams's on September 11, 1888.



square. Here the Chevalier St. George pays his suit to Beatrix, and all readers of that tale will recollect how, on the morning of Sunday, August 1, 1714, George is proclaimed before the King's Arms, by the Palace gates in High-street. Here, too, may be seen some of the powdering closets of the Georgian era. Thackeray removed from Young-street to what was then No. 36, Onslow-square, and thence to the red-brick house which he had built for himself on Palace-green, formerly "The Moor," at the southern end of Kensington Palace Gardens, *olim* Queen's-road, where he died on December 24, 1863. The writer went to his funeral at Kensal-green, and there, amongst the crowd around his grave, saw that genial author whose lines in *Punch* pleaded arrest of judgment by those who imputed cynicism to his dead friend, with one or two painters whose pencils owed inspiration to his pen, amongst them Sir John Millais, who now lives hard by, in Palace-gate. De Vere-gardens commemorate the circumstance that the Manor of Chenesitun, as it is termed in the Domesday Survey, was in the Conqueror's time held by Alberic, or Aubrey de Vere of the Bishop of Contances, who had received it from the King. It then passed to the De Vere's, Earls of Oxford, and continued to belong to that house until on the attainder of John, Earl of Oxford, Edward IV. bestowed it upon his brother Richard. They subsequently recovered possession, their holding thus lasting for a period, in all, of five centuries. At the corner of Kensington-road and De Vere-gardens, is the house which in our day forms subject of a leading case, by way of the appeal to the House of Lords, known as "Barlow and another v. Vestry of Kensington," in the matter of its line of frontage (ii. "App. Cases," H.L. 257).

#### SKETCH AT BOLSOVER.

The buildings shown in this sketch, by Mr. A. L. Buxton, form a portion of the building added by the son of Sir Charles Cavendish, who built the main portion in the early part of the seventeenth century. The building in the sketch is exactly the same in detail and general design as the Riding School, but the latter is so hidden by trees that it was impossible to take a sketch of it.

#### ARTS AND CRAFTS EXHIBITION SOCIETY.

##### "MODELLING AND SCULPTURE"

The second of the current series of lectures at the New Gallery in Regent-street was delivered on the 8th inst. by Mr. George Simonds.

The concluding sentence of the lecture gave the *motif* of the whole. We cannot make an artist, who must be endowed with the poet's mind; but we can teach a craft. Accordingly the artistic side of the subject was left untouched; its historical aspect was only casually glanced at; and the address, which was spoken *ex tempore* and lasted an hour, was confined to an exposition of the mechanical processes involved in the sculptor's art, and advice as to

the qualities and suitability of the various materials and tools employed by him.

The best arrangement of stands and bankers, the construction of turntables, the forms of cores for various materials, the proportion of "roughing" to the modeller's clay, and the best medium for colouring the modelling wax, were each in its turn exhaustively dealt with. Practical hints as to the due damping and necessary drainage of the clay model, and as to the various processes of "case" moulding and "waste" moulding preliminary to casting, followed. Some useful information was given on the subject of modelling in gold, silver, copper, tin, and iron, soft Swedish iron being easily modelled cold, and copper lending itself readily by reason of its extreme ductility to the sculptor's purposes. No improvement has taken place in the few simple tools used by the sculptor, the drill, the point, the chisel and the rasp, and such as they were in the time of Pericles they still are. Nothing was said as to the working of the harder granites and porphyries, nor was the beautiful art of ivory carving alluded to. But an hour is not much for so wide a subject, which would, indeed, as the lecturer said, afford material for a week's discourse.

The interest of the address was heightened by the manual illustrations which were adroitly performed during its delivery upon an unfinished clay bust of Mr. Walter Crane. It is upon the plastic clay that almost the whole of the sculptor's art is really expended. Into this he puts his first inspiration, and upon this he works until his ideal is satisfied. It is then handed over to the craftsman for translation into marble or bronze. In the former case the process is prosaic enough, and it must be owned the system of "pointing" and reproduction in fac-simile by compasses and callipers, and (if enlarged or reduced) by the application of the theorem of similar triangles, does take a little of the poetry out of the finished works for those who are behind the scenes. The original finished sketch came straight from the artist's hand, literally, for it is to the sensitive touch of finger and thumb that all its charm are due. The bust of the President, which was used for illustration, was described as wholly thumb-work, assisted only by the nail, which, as the lecturer remarked, is found very handy for dividing the hair, and marking the finer lines, &c.

The statue, though never so carefully finished, is by comparison a dead thing, and every one who has seen the clay original before reproduction must have sighed over the inevitable loss of artistic point and force involved. If this inventive age would but invent a plastic medium, which should be amenable to the artist's touch, and would then, without change of form, harden into permanence, it would, indeed, deserve our warmest thanks. It might be supposed that the baked clay,—terra-cotta,—provided the artist with such a resource, and that in it, at least, the artist's work was preserved at first hand. But the difficulties of drying and firing, the risks of shrinkage and distortion, and the possibility of destruction in the kiln or afterwards,—in either case wasting all the artist's labour,—are hindrances which can never be





"Wandle-cot," Carshalton.—Mr. H. D. Appleton, Architect.

wholly surmounted, and limit the employment of terra-cotta to comparatively small and unimportant works.

Monumental works must be in marble or in bronze. The selection of a sound block of the former, having a suitable grain, being free from flaws, and capable of resisting exposure to the weather, is not a very trying necessity for the modern sculptor, who has the abundant Carrara quarries to draw upon.

But the casting of a bronze statue is a different matter, and presents engineering difficulties of a special kind. The lecturer expounded, by the aid of diagrams, the whole process, and dwelt at some length on the numerous precautions to be taken against accidents and explosions by the sudden expansion of the heated and imprisoned air.

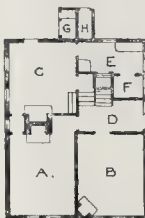
Mr. Simonds secured the confidence of his audience by his obvious command over all the methods he described and illustrated. His address, the only fault of which was its brevity, was received with deep attention, and was rewarded at its close by a spontaneous and hearty burst of applause.

**The New Fish Market in the City.**—One of the last official acts of Sir Polydore de Keyser, as Lord Mayor of London, was to open the new fish-market, which has been erected by the Corporation on Snow-hill, and which will replace the market opposite, which latter will become, as was originally intended, a fruit and vegetable market, in lieu of the inconvenient and dilapidated Farringdon Market. The new market, which was designed by the late Sir Horace Jones, occupies a space of 14,000 square feet, and has cost (according to the *City Press*) about 25,000. The style is Italian Renaissance. The building has a granite base with Portland stone pilasters, surmounted by cornice, pilasters, and dormers of Portland stone. The work has been carried out by Mr. Mark Gentry. There are thirty shops or stalls, all of which, excepting three or four, are already tenanted. The market, it may be added, is largely built on a sub-structure of iron girders above the London, Chatham, and Dover Railway's City extension.

#### "WANDLE-COT," CARSHALTON.

THIS is a summer cottage of a cheap character. The walls are only carried up to the first-floor level, the vertical tiling being hung on rafters. There are five bedrooms and a bathroom and w.c. on the first floor. The materials are Epsom red bricks and Ewell hanging-tiles and Broseley roofing-tiles.

- A. LIVING ROOM
- B. PARLOR
- C. KITCHEN
- D. HALL
- E. SCULLERY
- F. LARDER
- G. W.C.
- H. COALS.



The work is being carried out by Mr. G. Stunt, of Park-road, Forest-hill, S.E., from the design of Mr. Herbert D. Appleton, F.R.I.B.A.

#### BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE present session of this association was opened on Wednesday last, the 14th inst., by a conversation held in the Edgbaston Assembly Rooms, at which about 300 members and friends were present, including, amongst others, Messrs. J. Naden, President; W. Doubleday, Vice-President; H. R. Lloyd, Hon. Sec.; F. B. Osborn; F. B. Peacock; J. W. F. Newton; Hy. Beck; C. E. Bateman; W. H. Bidlake; A. Reading; V. Scruton; Councillors M. Pollack (Ex-Mayor), R. F. Martineau, J. Bradley, Lawson Tait; Registrars Cole and Parry; Profs. Hillhouse and R. H. Smith; Messrs. E. R. Taylor, W. Wallis, J. Pratt, J. W. Tonks, W. S. Till, S. Walliker, and P. Porter.

The proceedings commenced with a reception of the guests by the President and Committee,

after which a few selections of instrumental music were given in the ball-room.

In the drawing-rooms were arranged a large collection of sketches and photographs of interesting buildings, noticeable among them being the sketches lent by Mr. H. Pope, and the photographs by Mr. H. Baker; whilst the ball-room was rendered additionally attractive for this occasion by the display of Oriental curios and draperies, and some specimens of local art manufactures. Among the works thus exhibited were several very good specimens of wood-carving lent by Messrs. J. Plunkett & Co., and the art-metal work of Messrs. Hart, Son, Peard, & Co. The decorative glass of Messrs. J. R. Lee & Co., and the various specimens of drapery, &c., from Messrs. Liberty & Co., also attracted much notice. Dancing was begun at 9 p.m., and was carried on to the small hours of the morning.

#### THE ARCHITECTURAL ASSOCIATION.

THE second meeting of this Association for the present session was held on the 2nd inst., in the meeting-room of the Royal Institute of British Architects, Mr. H. D. Appleton (President) in the chair.

The following new members were elected, viz.:

Messrs. J. A. Waddington, E. O. Wane, S. P. Davis, J. B. Tanley, E. C. Finch, W. L. T. Brown, M. J. Hardwick, A. Spiers, A. J. Roddie, F. R. Rhodes, W. Langheim, A. Cox, C. Roche, A. G. Salmon, A. E. Watson, H. P. Adams, A. P. Crabb, R. N. Sturges, L. H. Bishop, S. Howard, G. P. Armstrong, M. Price, A. Heywood, E. R. Cook, P. S. Worthington, H. E. S. Stratfield, H. E. Kirby, J. C. Watt, W. W. S. Smith, J. Hunt, J. H. Richardson, H. L. Goddard, H. F. Mence, G. Kenyon, D. E. Niven, A. H. Crawford, A. Wellheim, J. H. S. Fane, A. A. Abrahams, E. C. Frere, J. A. Fywell, F. E. Williams, F. J. Potter, J. Murray, J. Steuart, J. B. Stark, F. Cook, J. W. Weiss, A. Whitcombe, E. A. Whigham, W. C. Ashworth, H. E. Elkins, W. E. Holland, G. G. Lynes, J. W. Hall, G. P. Pratt, R. W. Gibson, R. Story, F. J. Slater, C. G. D. Jones, E. J. Wallis, H. G. Leslie, H. C. Mann, C. Evans, W. A. Hughes, and W. Pallett.

Mr. J. A. Gotch read a paper on "Elizabeth and Victoria," which we printed in *extenso* last week.

The Chairman, in opening the discussion, remarked that the interesting paper they had



heard read by Mr. Gotch would make them look forward with increased hope to the valuable work he had undertaken, of illustrating the Renaissance chimney-pieces of England. If he might be allowed to express a hope, it would be that Mr. Gotch should extend the scope of the work, so as to make it really a comprehensive study of English Renaissance work similar to the splendid one on the German Renaissance (applause). Mr. Gotch's description of Elizabethan houses reminded him very much of Bacon's essay on building, in which he drew out his idea of a perfect palace, and it had often occurred to him that that would be a very good subject to set for the Architectural Association Medal design. The subjects for those designs should tend towards strengthening or drawing out the imaginative faculties of the students, rather than exercising their ingenuity by giving them restricted sites and conditions. The restricted sites and conditions would come all too soon in their own practice (laughter). It seemed to him that one of the lessons to be learnt from the study of Elizabethan work was the way in which the foreign forms dealt with were treated. The unconventional work to be found in the early Renaissance buildings, such as Bolsover, Wollaton, and Kirby, gave those houses more than half their charm; but, as the work became later and more conventional, the interest waned. The lesson to be learned seemed to be, that the early men thoroughly digested and assimilated the forms before using them. Elizabethan art had to a certain extent suffered by the revival of the style in the early part of this century, when so many examples of it were carried out in Portland cement (laughter). He did not know whether it had affected them in the same way as it had him; but he considered there was no more ghostly work than some of the so-called Elizabethan buildings of the early part of this century. The points most suited for discussion were the best way of studying the English Renaissance; the way in which it could best be adapted to the present requirements; and what were its particular features as compared with those of the other styles of Renaissance art (applause).

Mr. Francis Hooper proposed a cordial vote of thanks to Mr. Gotch for his admirable paper. The way in which the subject of Elizabethan architecture had been brought forward was particularly instructive, because it put before them a period when new demands were being made upon the architects of England, and showed how these demands were met. In the time of Elizabeth the country enjoyed peace, and it was therefore possible to give up the old fortified system of domestic residences. The Church has been shorn of much of its wealth, and its property distributed amongst individuals, who at once wished to show what use could be made of it. The consequence was that new demands were laid before the architects, who, finding the prevalent styles in England somewhat unsuited to their clients' wants, went to Italy, where was to be seen a style of palatial architecture which seemed likely to suit their English patrons. Mr. Gotch, however, laid before his hearers the fact that those architects did not in every way succeed. They gained a certain palatial effect at the expense of the comfort which should have been their first consideration. It might not be the lot of many present to build palaces such as Elizabethan architects designed; he was afraid most would have more modest work to do. Architects might still, however, strive to secure dignity in their work, although they might only have to build a block of warehouses, shops, or artisans' dwellings. It was therefore possible to study the Elizabethan men, and to gain, not at the expense of comfort, but perhaps at the sacrifice of time and thought, something of what the French now seemed to have gained. He had been for some little time in France this summer, and it was very encouraging to him to find French architects commending the comfort secured in planning, and the simplicity of modern English domestic architecture. Simplicity was an admirable thing to attain, but the dignity of buildings should also be studied. In this, the greatest and richest city of the world, there might be more in the way of monumental architecture. The present street architecture, though it contained in itself many gems, showed but little studied dignity. Indeed, if dignity and picturesque were now obtained, it was rather a matter of chance or accident. Turning to another side of the subject, they had to bear in mind the opportunities they now enjoyed, and which were not afforded to the Elizabethan archi-

tects. The comprehensiveness of their studies was brought out by the fact that they were compelled to study all new materials and building appliances, and to consider every improvement which was laid at their disposal. This added to the scope of their work, and materially strengthened their hands, hence no style of the past could be their aim, but only their assistant. In studying the past, they would gain experience of what had been done before, and should develop a style of architecture which would exhibit all the facilities they had for construction and decoration (applause).

Mr. H. O. Cresswell, in seconding the vote of thanks to Mr. Gotch, said that his only regret was that the paper had been so brief. Mr. Gotch was such a master of that particular phase of art that one felt a little diffidence in criticising him, but there was one point which he believed Mr. Gotch even would admit was to a certain extent a blemish on Elizabethan architecture, and, perhaps, its greatest blemish—namely, its slavish symmetry. He was afraid that the blindest admirer of Elizabethan architecture could hardly commend the magnificent 20 ft.-high windows at Kirby, with a floor carried through the middle of them. Mr. Gotch had said that they could not do that at the present day, but he saw an example of the same sort of thing in one of the professional papers,\* as having been done by a very famous church architect quite recently (laughter). Whether they had admired it or not was another question, but certainly some very scathing remarks had been made on it, and if they knew the name of the architect of Kirby, perhaps they might also have a rod in pickle for him, always presuming it was done by the original architect. The President had suggested a subject for consideration, as to how Elizabethan architecture might be adapted to modern requirements, and what might be learned from it at the present time. There was always a great difficulty in studying Elizabethan architecture with the view, he would not say of cribbing, but of extracting suggestions from it (laughter). The Elizabethan architecture they knew was itself a Renaissance, and the men who employed it were introducing what they believed to be a reproduction of Classic detail. Gothic forms of arrangement had not entirely gone, but there was no doubt they believed they were reproducing Classic work to a very great extent. If some of the details—the cornices, caps, and other ornamental features,—were examined, it would be found that there was a great difference between the details executed by the Elizabethan architect and those executed by the Classic architect,—he was speaking, of course, of real Classic work. They, in the present day, had the advantage of a great number of archaeological researches, studies, and books by eminent men, which showed the whole detail of the Greek or Roman temple, but these advantages were not at the command of the architects of the Elizabethan period, consequently it would be absurd affectation for them in the present day to imitate the detail of a period of art which itself aimed at reproducing that of a former period, and, as we now knew, only succeeded very imperfectly. Whether a good deal could not be learned from studying the quiet dignity and repose of these Elizabethan mansions was quite another question. Unfortunately, they had not the same requirements nor the same easy-going clients that the old men had, and the impression left by the paper on his mind was one of regret that he had not been an architect in the days of Elizabeth (applause).

Mr. S. W. Kershaw, F.S.A., remarked that one great charm of the Elizabethan architecture was its originality, partly arising from the revival, or rather birth, of the New Learning, which touched all England in its power. This change is depicted by the graphic pen of Mr. Green, the historian, who says: "The strength of the Mediaeval fortress gave way to the pomp and grace of the Elizabethan hall." It was almost impossible to reproduce some of the forms one occasionally saw, because he believed the architects, whoever they were, and some of them were noted men, worked with a great deal of love for their art. It was interesting to watch the adaptation of the ornamental sculpture of the time, derived from Classic models. The President had referred to a book lately brought out on

the German Renaissance, and everybody who had seen it must admire that beautiful work. He only wished that some one would illustrate the English Renaissance on the same scale (applause). They knew that Mr. Gotch was about to do something of importance, but he would like to see a record of every Renaissance bit in England.

Mr. L. A. Shuffrey said he had visited Kirby in company with Mr. Gotch, a year or two ago, and it seemed to him that most of its charm lay in the want of that regularity which was to be seen in many of the buildings of the period. There was a certain balance on the entrance side, but not two parts were exactly alike. He had forgotten the window that had been referred to, but there was not much harm in carrying a floor across a mullioned window, as a solid panel could easily be made on the outside. Most of those buildings had gained immensely by the hand of time. If architects nowadays attempted to use all the details of those times, everybody would complain of their excessive coarseness; but in the effluxion of time the buildings became grown over with moss, and softened down. Generally speaking, however, it was a style to be carefully studied. What struck him particularly in those buildings was the apparent necessity for carrying the architecture on to the ground. Burleigh, for instance, appeared to drop on the plane of the lawn, without any terraces or work of that kind, and the effect, to his mind, was most unsatisfactory. One symmetrical front could not be obtained on the garden side, without interfering with the plan, but to arrange a symmetrical entrance elevation seemed a very difficult thing to do. It struck him, when Mr. Gotch was discussing the method of work in those days, that the buildings must have taken a very much greater time to erect than at the present time. No doubt the old men put up their stone walls first, and began to think about the woodwork when the building was fairly well to be seen, and in that way they had an immense advantage over the architects of the present day. To see the whole concern on paper, and to get out the details for the quantity-surveyor, before the job was commenced, was quite a different matter.

Mr. C. H. Brodie said that they had been told that, although some French architects admired the Victorian architecture, they considered there was a smallness and want of dignity about it. He would ask, were the architects responsible for that? He believed they were to a great extent, and especially in the case of street architecture. Was it absolutely necessary for an architect, who was called in to build on a 20 ft. or 30 ft. frontage, to put up something quite different to what had been erected next door, probably only six months before? Was it absolutely necessary that every string-course and cornice should be so much higher or lower than those of the man next door? Was it not possible to erect buildings that did not clash with those next them? And should we not then get rid of the feeling foreigners seemed to have, that our street frontages were a very higgledy-piggledy lot, although often very good in themselves (applause)?

A Member said that Mr. Gotch had asked what architects would think now if some nobleman came down and made suggestions in the middle of their jobs. It seemed to him that that was the very thing they would like, because it was just what such interference took place that the profit came in (laughter).

The President, in closing the discussion, said he was afraid Mr. Brodie's ideas would be strongly combated by the demon of advertisement, which caught hold of clients, and sometimes, he was afraid, of architects too. Then again, people here did not like to be controlled by their next-door neighbour in regard to anything. Mr. Hooper's remarks on the dignity which might be imparted to modern buildings was a very valuable suggestion, and that was one of the reasons why he (the speaker) threw out the idea of treating Bacon's essay as a subject for their designs. Mr. Cresswell might find a great many instances of floors crossing windows in other works than those of John Thorpe, or any of the Elizabethan architects. He had only to go down to Whitehall, and he would find instances of it.

The vote of thanks was then put to the meeting, and carried by acclamation.

Mr. Gotch, in the course of his reply, said the President had been kind enough to mention a work on Renaissance chimney-pieces in which he (the speaker) was presumed to be engaged, but he was bound to say he was not aware of

\* See *Builder* for Sept. 22 last, for illustrations of the way in which Lord Gresham has dealt with the south transept window at St. Albans Cathedral. It is a mistake, however, to suppose that the cases are parallel. The builder of Kirby did not put sham arch-heads inside and black them to prevent their being seen outside.—Ed.



it himself (laughter). On the other hand, on such a work as had been suggested—viz., a work illustrating largely the Renaissance architecture of England in a similar manner to what had been done for German Renaissance—on such a work he might say, in confidence, he was engaged (cheers). These things were proverbially long in being brought to a successful issue, but he hoped that next year some parts of the work might appear. Referring to the terrible revivals of Elizabethan architecture that took place early in this century, and which were absolutely to be avoided, he held that what they had to bring to the consideration of their problems was, first of all, common sense, but if they went to Elizabethan times for hints as to how to treat those problems, they would be doing a reasonable thing, and one which might have a good result. They must attack their own problems in their own way, and only study past styles of architecture in order to see how the old people solved the problems of their day. It might not be in the recollection of all present that, two years ago, Professor Aitchison, in the course of a lecture, suggested that the Association should give prizes, not for designing special buildings, but for designs which should embody certain ideas, in the same way that the President had suggested that they should give a prize for a design embodying the idea of dignity. The suggestion seemed to him a most valuable one (applause). Mr. Cresswell had deprecated the slavish symmetry of Elizabethan architecture, but that was one of the things he (the speaker) rather desired to condemn. But, on the other hand, there was a line to be drawn between that and the very Gothic idea that every feature should have its mission, and be exactly proportioned to fulfil that mission. The windows at Kirby he had taken exception to as having faults. They could not do such things now without offending the susceptibilities of those who know anything about the matter, and what the amateur architect of St. Albans did was, he maintained, very little guide to architects (cheers). Mr. Cresswell had said that the architects of the Renaissance reproduced Classic work, and that was perfectly true of the architects of Italy; but his impression of the English Renaissance architects was not that they reproduced Classic work, but that their work was the recollection of Italian work. He did not advocate a slavish copyism of the details of Elizabethan work, but they could observe *in situ* the effect of all sorts of mouldings, and thence judge the effect of their own. Mr. Shuffrey had referred to the unhappy effect of Burleigh House rising from the ground without terraces, and with that he agreed. He believed, however, that at the time the house was built there were terraces, which had since been destroyed. Another thing mentioned was the time occupied in the erection of the houses themselves. The houses took years and years to build, Wollaton taking eight years, Kirby at least five years, and other houses taking a correspondingly long time, which was another advantage the old architects had as compared with those of the present day. As to the idea of architects assimilating their designs to those of their neighbours, he was afraid the owners would not be likely to agree with that. He wished his shop to look like his own, just as he desired to make it known that he had no connexion with any one of the same name, either over the way or next door (laughter).

Over thirty members of the Association attended Mr. H. Lovegrove's first lecture. The second, on Friday the 23rd inst., will be "Drainage and Sanitary Work," an entirely new paper on that important subject.

#### ARTICLES OF PUPILAGE.

THE following proposed form of articles of pupilage has been approved in principle by the Council of the Royal Institute of British Architects, and is to be considered by the members at the business meeting to be held on Monday next:—

"This Indenture, made the \_\_\_\_\_ day of \_\_\_\_\_ Between (the \_\_\_\_\_ of the \_\_\_\_\_ of \_\_\_\_\_) of the \_\_\_\_\_ of \_\_\_\_\_ hereinafter called the Father [or Guardian] of the first part, Son [or Ward] of the said \_\_\_\_\_ hereinafter called the Pupil, of the second part, and \_\_\_\_\_ Architect [and Surveyor], hereinafter called the Principal, of the third part, doth (inwitnesseth) that the said Pupil of his own free will, with the consent of the said (Father) doth bind himself to the said Principal as a Pupil, to learn the Profession

or Business of an Architect [and Surveyor], from the \_\_\_\_\_ day of \_\_\_\_\_ for the term of \_\_\_\_\_ years thence next ensuing, And in consideration of the sum of \_\_\_\_\_ to him the said Principal paid by the said \_\_\_\_\_ (the receipt of which said sum of \_\_\_\_\_ the said Principal doth hereby acknowledge) He the said Principal doth accept the said Pupil and take him into his service for the said term, And the said \_\_\_\_\_ doth hereby for himself, his Heirs, Executors and Administrators, and the said Pupil doth hereby for himself covenant with the said Principal that he the said Pupil shall and will during the said term of years loyally execute and perform the lawful instructions and directions of the said Principal, and his secrets keep in all matters relating to the said Profession and other the Business of the said Principal, and will in all respects conform to the Rules of the Office of the said Principal. He shall not nor will do anything that shall cause damage or injury to the said Principal or his goods, nor knowingly suffer the same to be done or attempted by others: He shall not and will not absent himself from the service of the said Principal during the usual office hours of the said Principal without leave first obtained or caused to be granted by the said Principal, and in all respects he shall acquit and demean himself honourably, faithfully, and with diligence. And the said Principal doth hereby covenant with the said \_\_\_\_\_, his Heirs, Executors and Administrators, that he the said Principal shall and will according to the best of his skill, power and knowledge during the said term of years teach and instruct or cause to be taught, and instructed the said Pupil in the said Profession or Business of an Architect [and Surveyor] as it now is or at any time hereafter during the said term shall be practised by the said Principal: that he shall and will grant to the said Pupil holidays of not less than \_\_\_\_\_ weeks in the year, at such times as shall be convenient to him the said Principal. And that with the object of enabling the said Pupil to qualify himself for passing the Examinations for Studentship and Associateship of The Royal Institute of British Architects, he the said Principal shall and will allow the said Pupil such absence as he the Principal shall deem reasonable for the purpose of attending Lectures, Classes of Instruction, and the said Examinations. And each of the said \_\_\_\_\_ the said Principal and \_\_\_\_\_ doth for himself, his Heirs, Executors and Administrators, hereby covenant with the other that in the event of the incapacity from illness or otherwise of the said Principal to carry on his Profession, or of his death, or of the incapacity from illness during \_\_\_\_\_ months or the death of the Pupil, on or before the \_\_\_\_\_ day of \_\_\_\_\_ the said Principal shall and will return to the said \_\_\_\_\_ the sum of \_\_\_\_\_ and the said \_\_\_\_\_ shall and will accept such sum in settlement of all claims on the estate of the said Principal in respect of these presents; and in the event of the happening of any of the aforesaid events after the said \_\_\_\_\_ day of \_\_\_\_\_ and before the \_\_\_\_\_ day of \_\_\_\_\_ the sum of \_\_\_\_\_ shall and will be returned and accepted as aforesaid; but in the event of the happening of any of the aforesaid events at a period subsequent to the last-named date, then no sum shall or will be returnable, nor shall or will any claim be made on the said estate in respect of these presents. And the said Principal, his Heirs, Executors or Administrators, covenant with the said \_\_\_\_\_ and Pupil that on completion of the said term of service these presents shall be handed over to the said Pupil, with a certificate of such service endorsed thereon.

IN WITNESS whereof the said parties to these presents have hereunto set their hands and seals the day and year first above written.

Signed, Sealed, and Delivered by the \_\_\_\_\_ above-named \_\_\_\_\_ in the presence of \_\_\_\_\_"

#### THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

THE second of Miss Harrison's lectures, delivered on November 9 at the South Kensington Museum, dealt with the Temple of the Dioscuri, the cults adjacent to the Propylæa, and the god Pan. The modern town of Athens reaches close up to the north side of the Akropolis, so that as yet the *Anakeion*, or Temple of the Dioscuri, has not been excavated; its site, however, is well known from literary evidence. Pausanias (I. 18) speaks of this temple as *ἀγῶνιον*, a term which with him usually means that a temple was built before the Persian wars. At Athens it would seem that the Dioscuri, or as they were more usually called *ἀνῆκτες*, were always regarded as foreign gods of Spartan origin. A vase from Kamiroi (Br. Mus.) and a relief (Louvre) showed them in their character of *ἰπποπόδες*, *ἑννύχοι*—stranger guest-gods—riding down to the sacred banquet-table—followed by them; their "austere daintiness" was, we are told, satisfied with oysters and cheese, followed by figs and fallen olives. Early representations of them at Athens were nameless, and it would seem that the *ἀνῆκτες* were at first distinct from the Dioscuri, with whom they were later identified. Probably in their origin they were much humbler—merely

a type of human twins, consecrated as something marvellous, and for which gratitude should be shown to the gods. A quaint archaic terracotta representing twin figures with high-peaked caps, such as might be given to any children, illustrated this theory.

With regard to the Propylæa, Miss Harrison regretted that she could not speak at length of this splendid building, which the Athenians themselves considered their most glorious work of art. Grand as the Propylæa are, they were intended to be much larger. From an examination of the ground-plan and of the architectural remains, it is clear that Mnesikles, the architect of the building, was compelled to alter his original design. In the case of the projected south hall, it is probable that priestly influence interfered. The new building would have encroached on the neighbouring sacred precinct of Artemis Brauronia. This precinct will, it is hoped, be excavated next year. At present, we have little to connect with it. A beautiful fragment of a caryatid represents the goddess Artemis herself; the word *ἀνῆκτες* on the back shows it to have been a votive offering. A still more interesting offering is that of a small stone bear (Akropolis Mus.) probably dedicated by one of the young girls who served the goddess under the name of bears (*ἄρκτοι*, Aristoph. Lys. 645). The two other important cults about the gates were those of Hermes Propylæos and of the Graces. The first most likely had his shrine under the small south portico, the latter had theirs somewhere behind that same portico. It was doubtless in allusion to this separation from the Graces, with whom he was so often associated, that Hermes was nicknamed *ἀνῆκτος*, "uninitiated." The Greek Graces, or rather *Charites*, must be kept distinct from the Græco-Latin Graces; they were nature-goddesses, givers of "grace and increase," akin to the Christian conception of grace; as such they danced to wake the slumbering earth to bring forth its produce for men. This capacity they were connected with Hekate, goddess of the lower-world, whence springs this increase, and possibly the type of the triple Hekate may have been suggested by the three *Charites* linked together for the dance. Hekate was worshipped as *Ἐπιπυργιδία* near the temple of Wingless Victory (Paus. II. 30); not far, therefore, from the shrine of the *Charites*. The connexion of the two cults is proved (1) by an inscription of the 2nd Cent. A.D. on one of the front seats of the theatre of Dionysos,—it reads *ἱεῖς καὶ Ἐπιπύργου καὶ Ἐπιπυργιδίας* | *πυργόποι*; (2) by a representation of a *Hekateion* with the *Charites* dancing round it. The relief of the *Charites* from the Museo Chiaramonti shows them led by Hermes to the cave of Pan. Here Hermes is no longer *ἀνῆκτος*, but may join with the *Charites* in the dance. The reliefs do not represent any particular cave, but at Athens, there was a cave specially consecrated to Pan—that most Greek and most human of gods, whom no one has yet attempted to explain as a sun-myth. The passage of Lucian, where Justice, talking to Hermes on the Akropolis, says:—"Before you go, Hermes, tell me who it is that is coming towards us; he seems to be horned, has a pipe in his hand, and hairy legs," was delightfully illustrated by a statuette of Pan in this primitive aspect. Later the Greeks got tired of Pan, with his goat legs and rustic smile; they made him into a melancholy youth. A fine instance of this later type is the celebrated bust at Munich. In conclusion the lecturer showed by literary evidence how strongly, and yet how differently, Pan had seized on the imagination of the old and the modern world: whether he was thought of as the joyous goat-legged god or as the player on the double reed—the one of Pleasure, the other of Pain.

**Proposed Technical Schools for Plymouth.**—A meeting of the general committee in connection with the technical schools intended to form Plymouth's Jubilee memorial was held on the 8th inst., to receive a report from the sub-committee, which recommended the adoption of the plans of Mr. Shortridge. This was agreed to by the meeting, and application for a grant will be made to the Science and Art Department. The cost of the building will be from 3,000l. to 4,000l.

**Bristol.**—New offices are about to be erected at Bristol for the County Fire and Provident Life Offices. The architect is Mr. E. Henry Edwards, of Bristol.



## CLOSE OF THE GLASGOW EXHIBITION.

THIS enterprise closed its public career on Saturday, November 10, with, for the day, an admission-list swollen, nominally, to the imposing total of 117,901, being by far the highest of any day on the record, and making a grand aggregate for the six months of 5,750,000. These figures are not, however, to be accepted anywhere without some considerable explanation and reservation, and probably the place which regards them with the strongest eye of suspicion of all will be found to be Glasgow itself. There, of late weeks especially, the cry has been, by any and every means, to surpass the record, first of Manchester, and, finally, if possible, of the "Colinderies" even. Edinburgh, with its modest 2,500,000, or thereabouts, had long been left far in the rear. The published totals for Manchester and the London Colonial respectively were 4,765,137 and 3,550,749; so that the record of the former has been distanced, nominally, by about 1,000,000, and that of the latter by about 200,000. If the Colonial had netted its full 6,000,000, it was still open to Glasgow to have "beaten" it by dint of extra turnstile exertions on the part of the stall attendants and the record-swelling portion of the season-ticket holders. It is notorious in the neighbourhood that this not very elevated order of emulation has been most diligently afoot for weeks, and certain active, long-limbed season-ticket men brag proudly, if somewhat silly, of having done their stated dozens of admissions daily, over a considerable period. At the same time it should be mentioned that not a few of the people of the place are heartily ashamed of their city condescending to engage, in any form, in the manufacture of "victory" on the shoddy principle. Even after discounting this, however, and the rate of discount must be very liberal to put matters on a legitimate footing, there remains for the Glasgow Exhibition a measure of undeniably substantial success, very much larger than even the most sanguine dared dream of at the commencement. Season tickets were sold, in full, to the value of 43,716*l.*, and up to 9 p.m., the final closing hour last Saturday, the gate-money realised a total of 118,938*l.*, raising the admission summation to 162,654*l.* Revenue from stall-rents, switchback royalties, and other sources must have been very large, and a handsome surplus is looked for, although it may not quite reach the figure which certain misinformed optimists hazard at the present time. Outgoings have been very heavy, and, unfortunately, unlike any mere record of admissions, there are no known means of artificially swelling such a thing as a surplus. Disposal of the surplus, whatever proportions it may ultimately assume, comes in for discussion hereafter, and this is an operation which will certainly be accompanied by no little friction of claim and opinion. A call is meanwhile being raised for the retention of the dome and immediate precincts as a permanency, with the view of utilisation as a people's palace and winter promenade; but advocates of this overlook certain formidable structural and architectural impediments in the way. Decision as to the disposal of the building, and apart altogether from the allocation of the surplus, now rests with the Magistrates and Town Council of the city, to whom the committee have made over all rights, conditionally.

Monday, the 12th, was by Guarantors, Committee, Executive, and Exhibitors devoted to a leave-taking or valedictory ceremonial within the building, the proceedings including addresses by Sir Archibald Campbell, Bart., President of the undertaking, and by Lord Provost Sir James King, with several minor speeches during the progress of a banquet, to which the others were entertained by the associated exhibitors. At one stated point, Sir Archibald Campbell, attended by his official following, led the way towards the grand entrance, and by means of a golden key, presented to him by the Lord Provost (to be afterwards retained by the President as a souvenir) formally locked the gateway thereof, while at the same time pronouncing the Exhibition fully and finally closed.

**Proposed Memorial to the late Mr. M. M. Bloxam, F.S.A.**—A subscription has been started among members of Rugby School and old Rugbeians to raise a memorial to the late Mr. Matthew Holbeche Bloxam, F.S.A., the well-known antiquary.



## SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held at Westminster Town-hall on the 5th inst., Mr. A. T. Walmisley, President, in the chair, a paper was read on "The Practice of Foundry Work," by Mr. H. Ross-Hooper.

The paper first briefly compared the particular qualities and properties of pig iron, with the view of determining the varieties which are best adapted to the requirements of the different kinds of castings made; and showing how the nature of cast iron depended not only upon the amount of carbon that it contained, but upon the conditions under which that carbon existed. The author then proceeded to illustrate how the failing of portions of a cast-iron structure may be traced to a want of knowledge in the way the lines of crystallisation flow on the cooling of the metal, and mentioning the weak points to be guarded against in the designing of cast-iron work. Moulding, or the production of a hollow mould to receive the metal, was next considered; for to mould melted iron into any required shape or form two things are necessary, (1) a pattern of the article to be produced, (2) a substance which will retain the impressions of the pattern made upon it and resist the violence of the metal when poured therein. To make a pattern a man requires to be thoroughly conversant with the principles of moulding, to so construct it that it may give a minimum of trouble to the moulder; the materials used for pattern-making and the general essential points of this branch being touched upon. The differences between green and dry sand moulding, the requisites of a good foundry sand, and the mode of preparing a mould for a small girder bed-plate, were entered into in detail, noticing those particulars which should be observed in the construction of sand moulding, and showing the uses of cores and the method employed in their formation both large and small.

The author next proceeded to describe the features of loam moulding, illustrating (by means of a working model) the process of constructing a mould for a drum capable of holding 200 feet of one-inch wire rope used in the erection of the Sukkur Bridge, India.

After explaining the operations of chill casting, malleable cast-iron, and the system of moulding known as "Jobson's blocks," whereby sand-moulds of thin, delicate patterns can be made by ordinary labourers, the author mentioned the different modes adapted for casting according to the forms and requirements of the various articles to be produced, and how sound results can only be obtained by a careful attention paid to the feeding of the metal to supply the shrinkage and drawing away which must inevitably occur on the cooling of the metal. The cupola, its construction, and advantages over other types of furnaces, and the manner of charging it, together with the appliances necessary to a foundry in the shape of drying-stoves, cranes, &c., and a "fettling shop" for the ultimate cleaning and dressing of castings, were duly considered.

The author then treated on the examination of cast-iron work and the care that should be observed in all inspection of the same, and finally discussed the tests usually applied and the general strength of cast-iron.

## HARDWICK "NEW HALL."

HARDWICK "NEW HALL," of which a small sketch is subjoined, was built between 1580 and 1597 by Elizabeth Shrewsbury, called "Bess of Hardwick," whose initials, "E. S.," are along the balustrade of the towers. This sketch was taken by Mr. A. L. Buxton, from outside the garden-wall, and shows the building as it appears from the gateway of the old Hall.

## Illustrations.

## DESIGN FOR AN INTERIOR.

THE drawing from which this illustration is taken is by Mr. W. Stirling, and was exhibited in the architectural room at the last Royal Academy exhibition, in which several able designs for ideal work, by the same artist, have found place during the last two or three years.

Mr. Stirling says of it:—"This design being a purely ideal one, and not made with any special view of its being executed, I think it does not require an exact description, but must simply speak for itself. The intention was to make a design which, as far as possible, should not reproduce any of the characteristics peculiar to some one style of the past, but rather those common to all styles, and should be merely suggestive of a treatment or scheme of decoration possible under varying circumstances."

## DESIGN FOR AN ELIZABETHAN HOUSE.

This design for a large house, by Mr. H. D. Wilkinson, was exhibited under the above title in the Architectural Room at the last Royal Academy Exhibition.

The design is, the author tells us, one of which the plan was prepared originally in a competition for the Soane Medallion. The house is designed with the idea of being built in a red sandstone, such as Mansfield, with stock brick and red brick facings for the servants' wing.

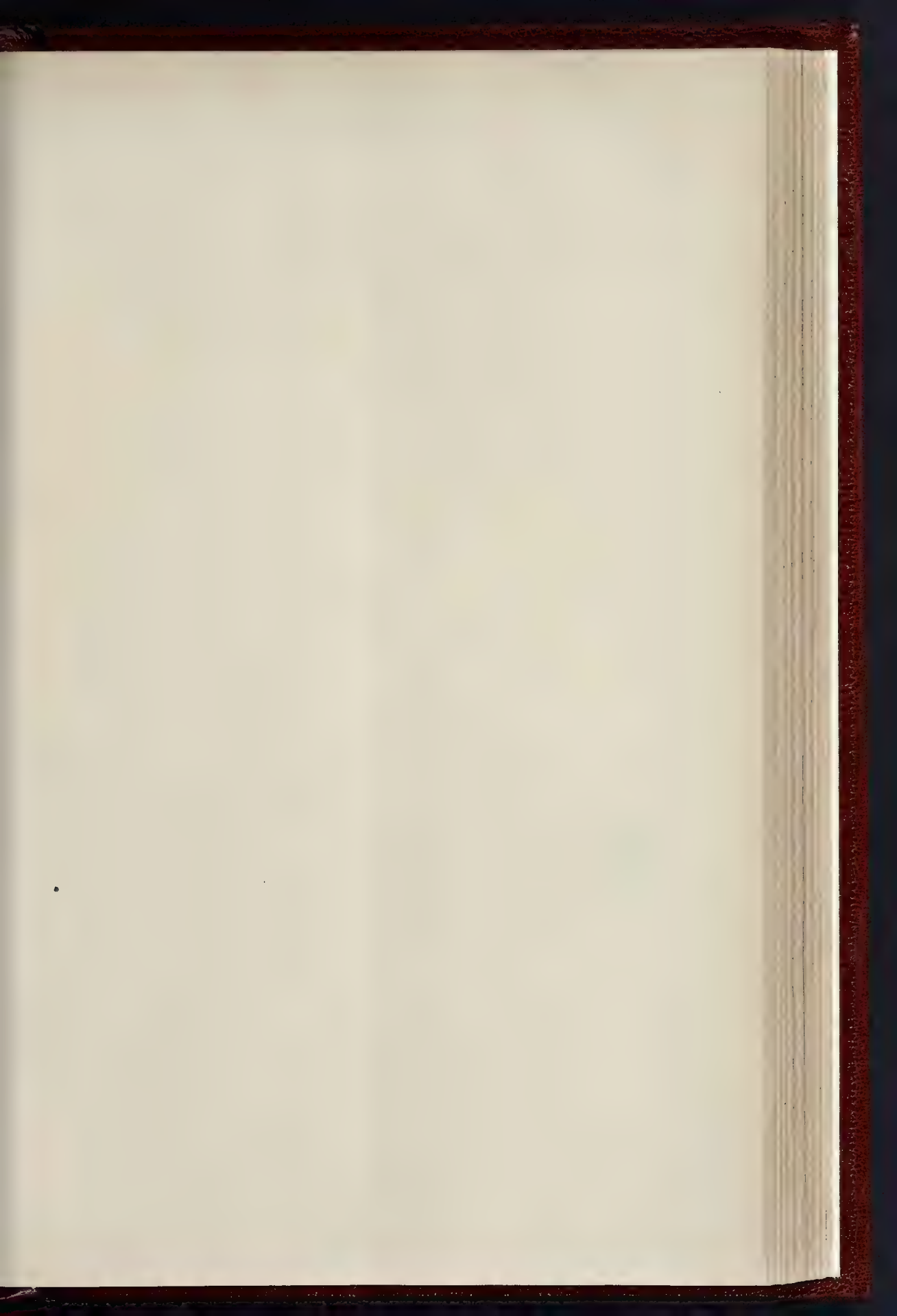
## FELIXSTOWE FREE CHURCH.

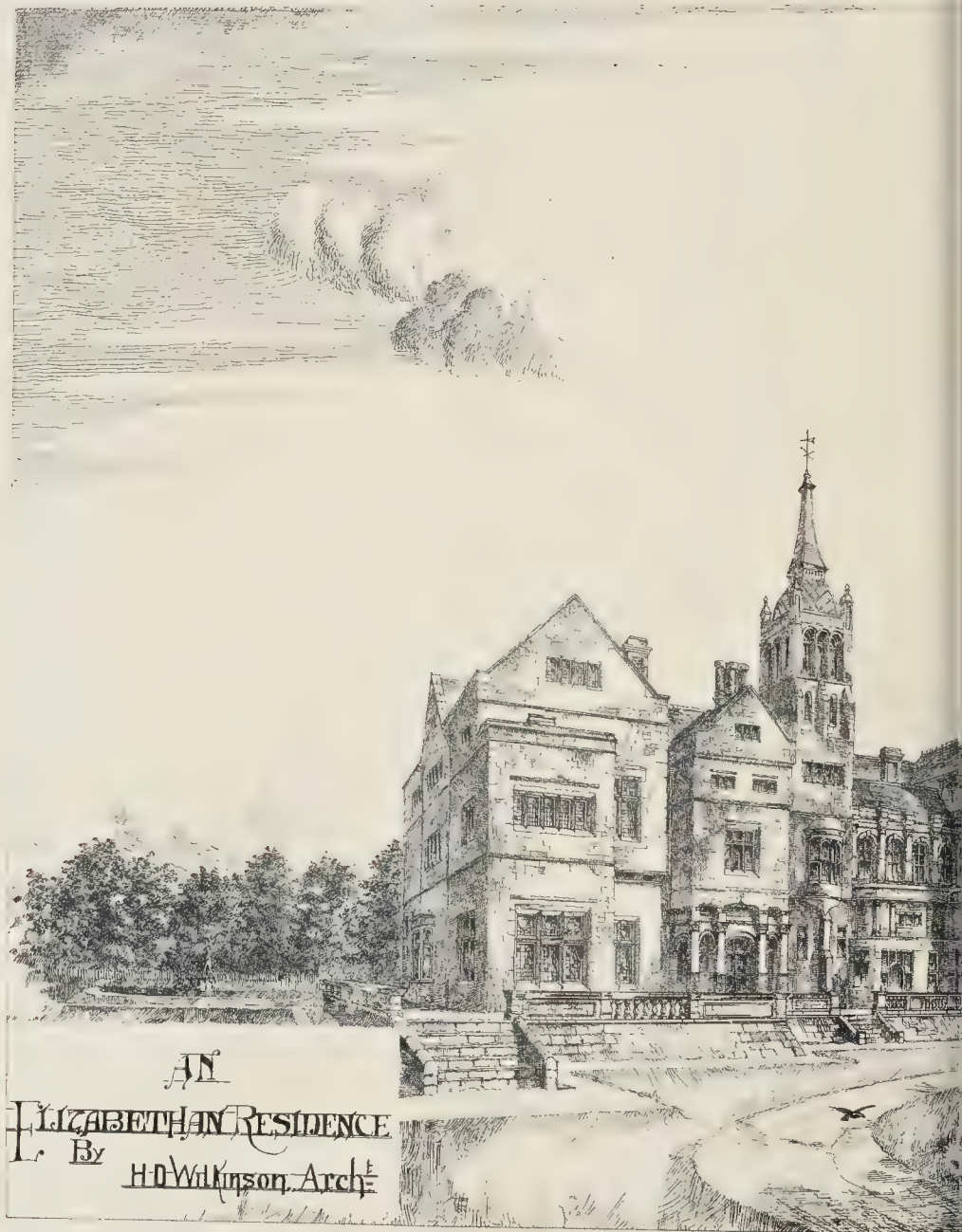
This church is about to be enlarged in accordance with the designs of Mr. Brightwen Binyon, architect, Ipswich. The present building will accommodate 300 persons, and by the proposed enlargement 251 additional sittings will be obtained. The alterations consist of an increased ground-floor space and the erection of a gallery. The entire front is new, and an extra height of 12 ft. has been added to the building.

## CHRIST CHURCH VICARAGE, WESTMINSTER.

THE Vicarage House of Christ Church, Westminster, is situated within the boundary of the churchyard of that parish, nearly opposite the Army and Navy Stores on one side and the Vestry-hall of Westminster on the other. The site being on the north-east of the church, the plan had to be specially arranged so to get as sunny aspects and as pleasant prospects for the rooms as possible; an octagon staircase hall consequently occupies the north-east angle of





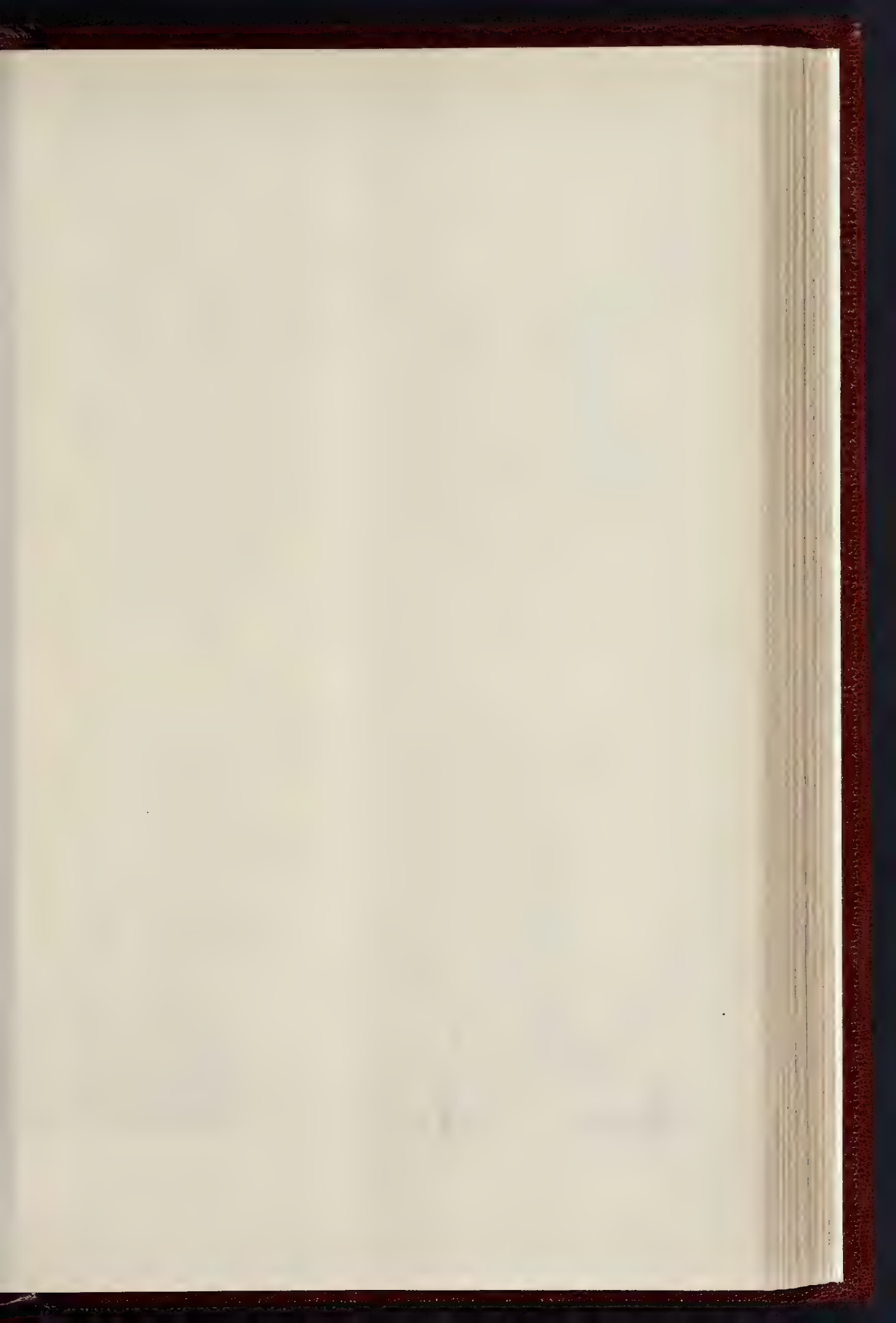


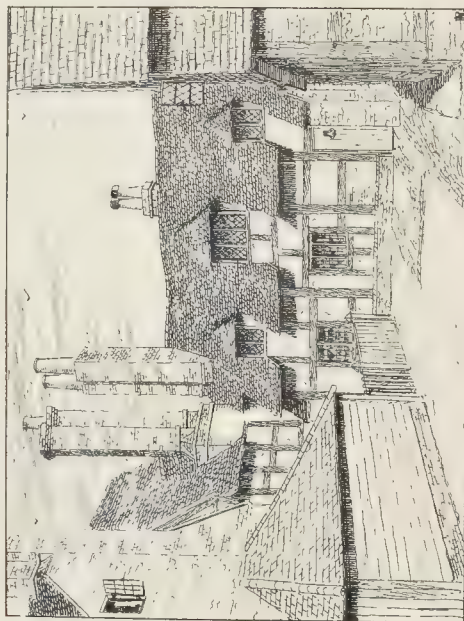


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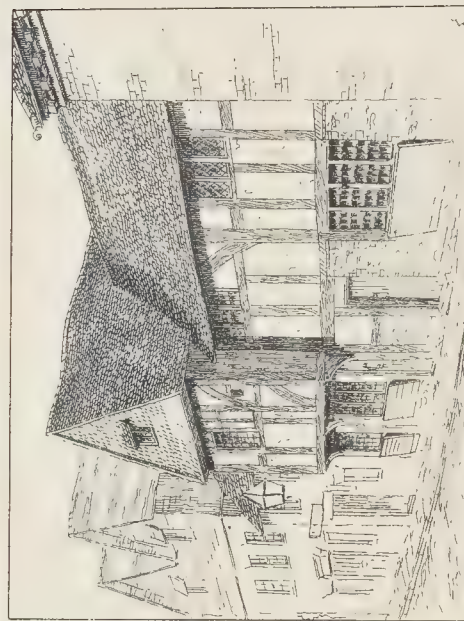




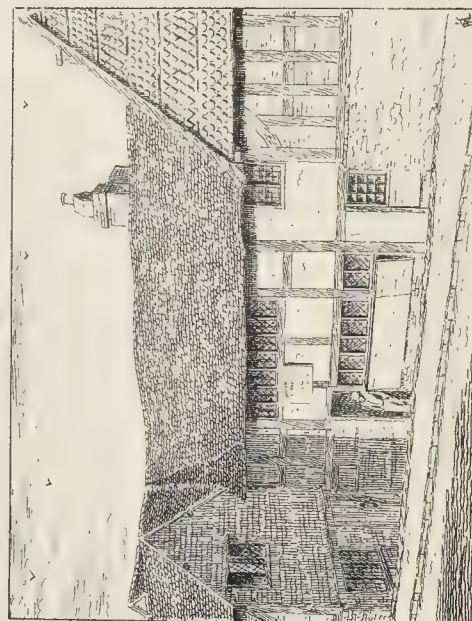




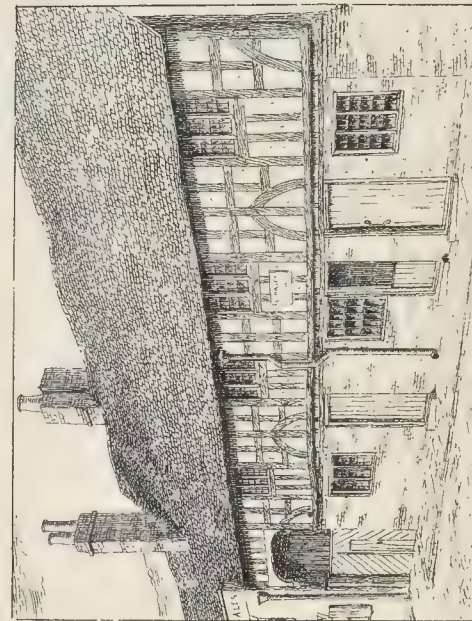
WHARF ST GODALMING



CHURCH ST GODALMING

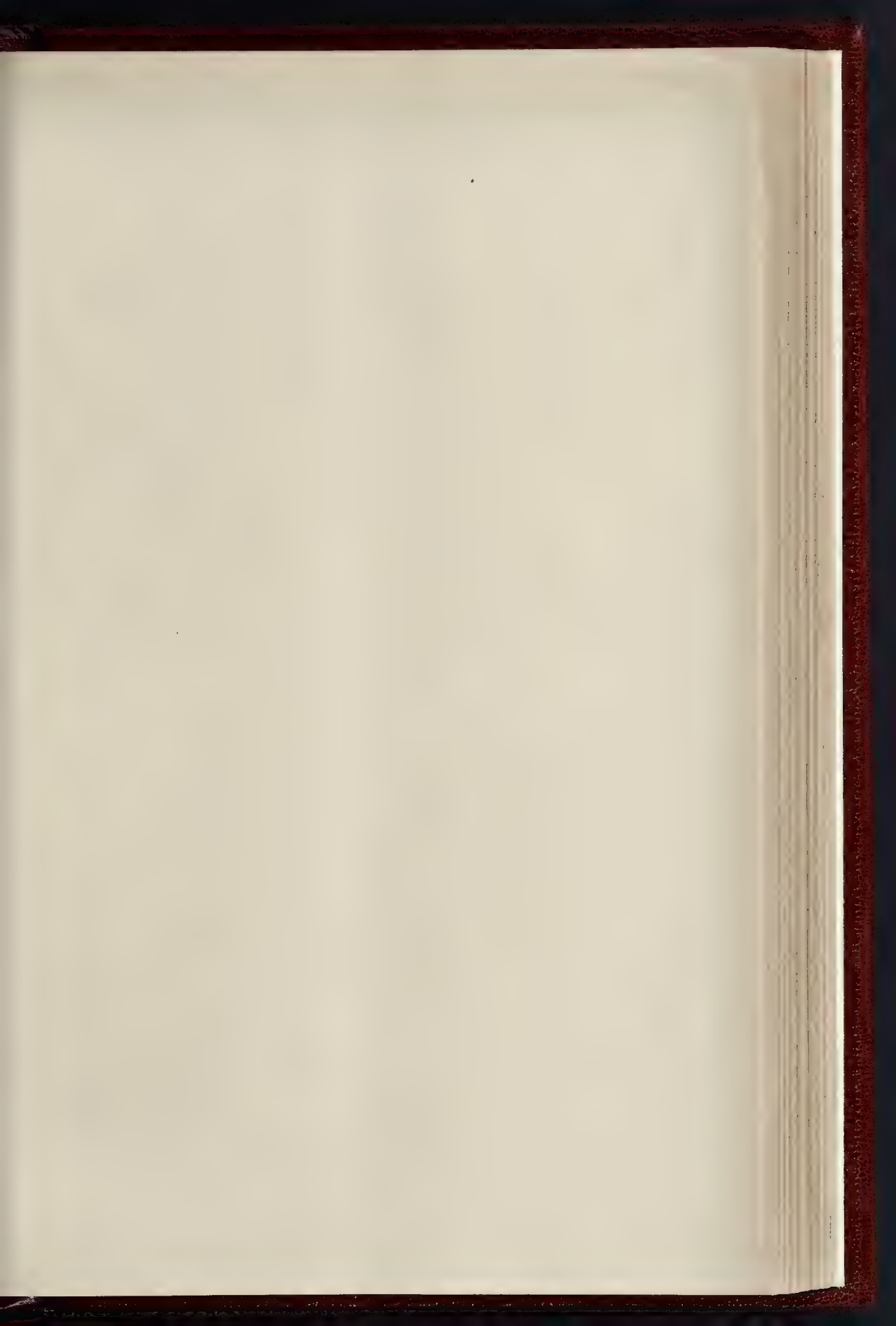


OCKFORD ROAD, GODALMING



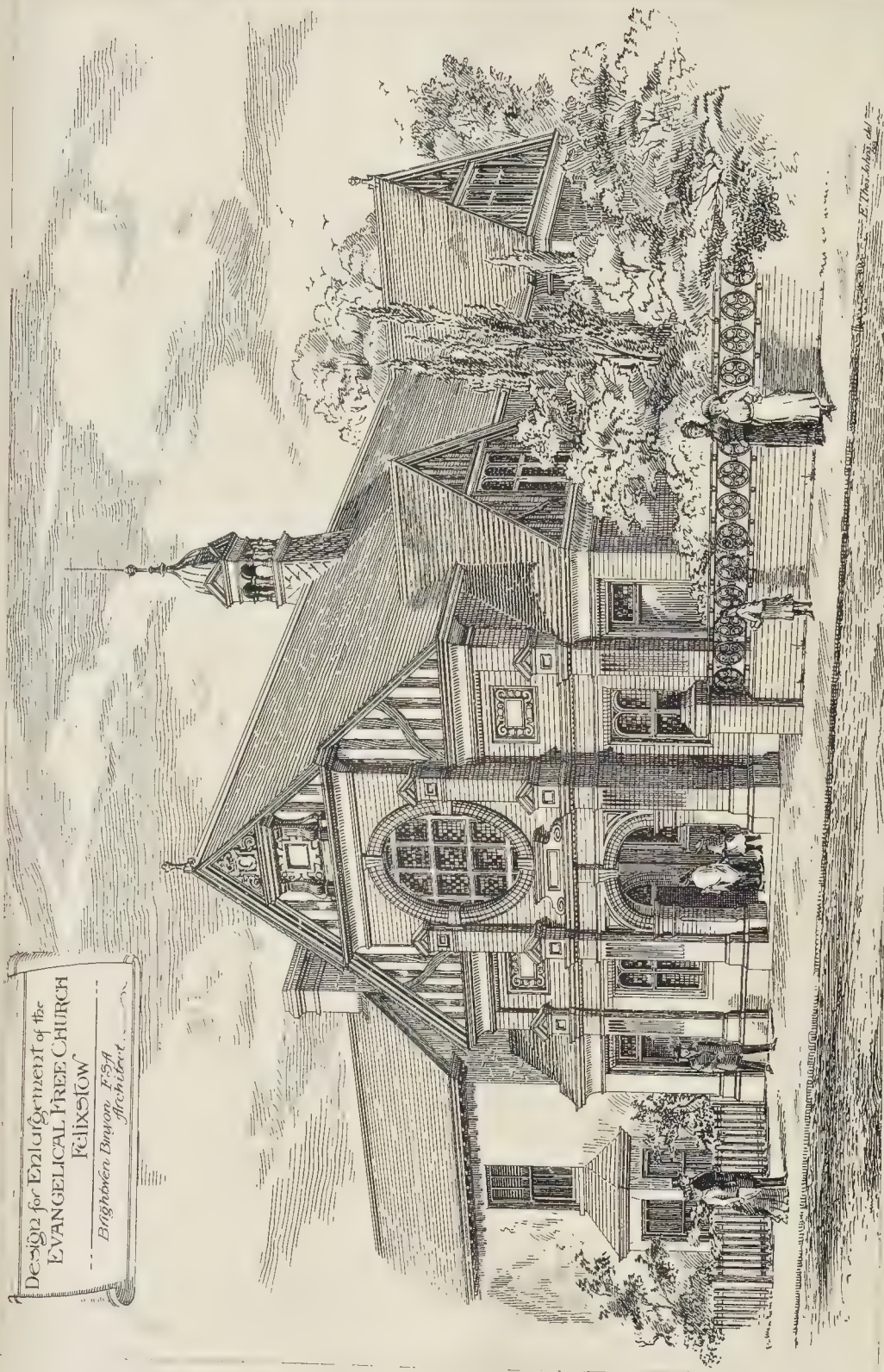
CHURCH ST GODALMING





THE BUILDER, NOVEMBER, 17, 1868.

Design for Enlargement of the  
EVANGELICAL FREE CHURCH  
Felixstow  
Brighton Bayon, F.S.A.  
Architect.



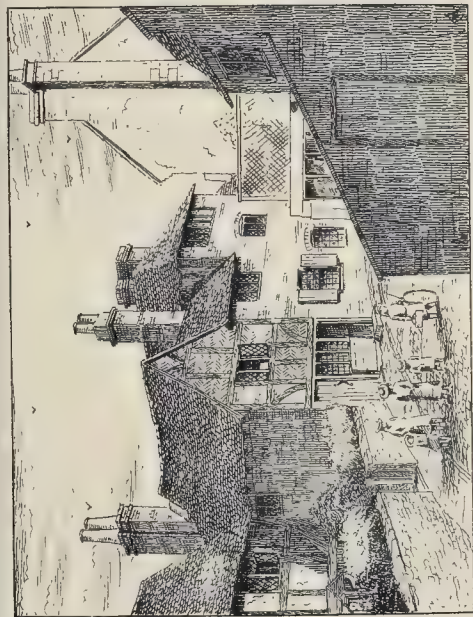




CHRIST CHURCH VICARAGE, WESTMINSTER.—MR. J. P. SEDDON, F.R.I.B.A., ARCHITECT.



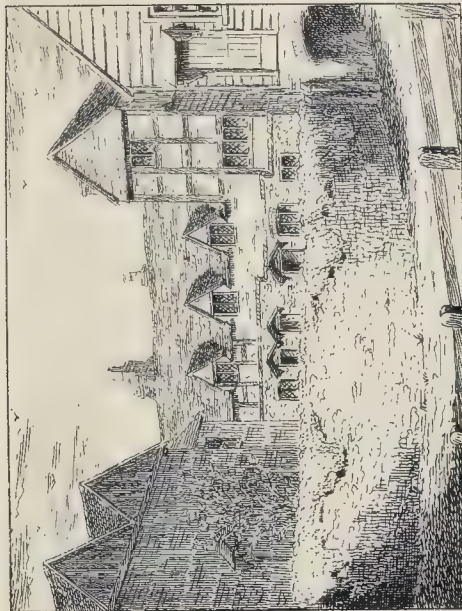




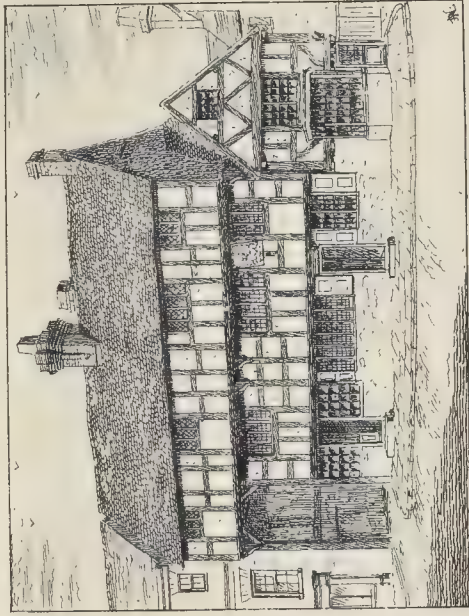
HART LANE, GODALMING



HIGH ST, GODALMING



THE MINT, GODALMING

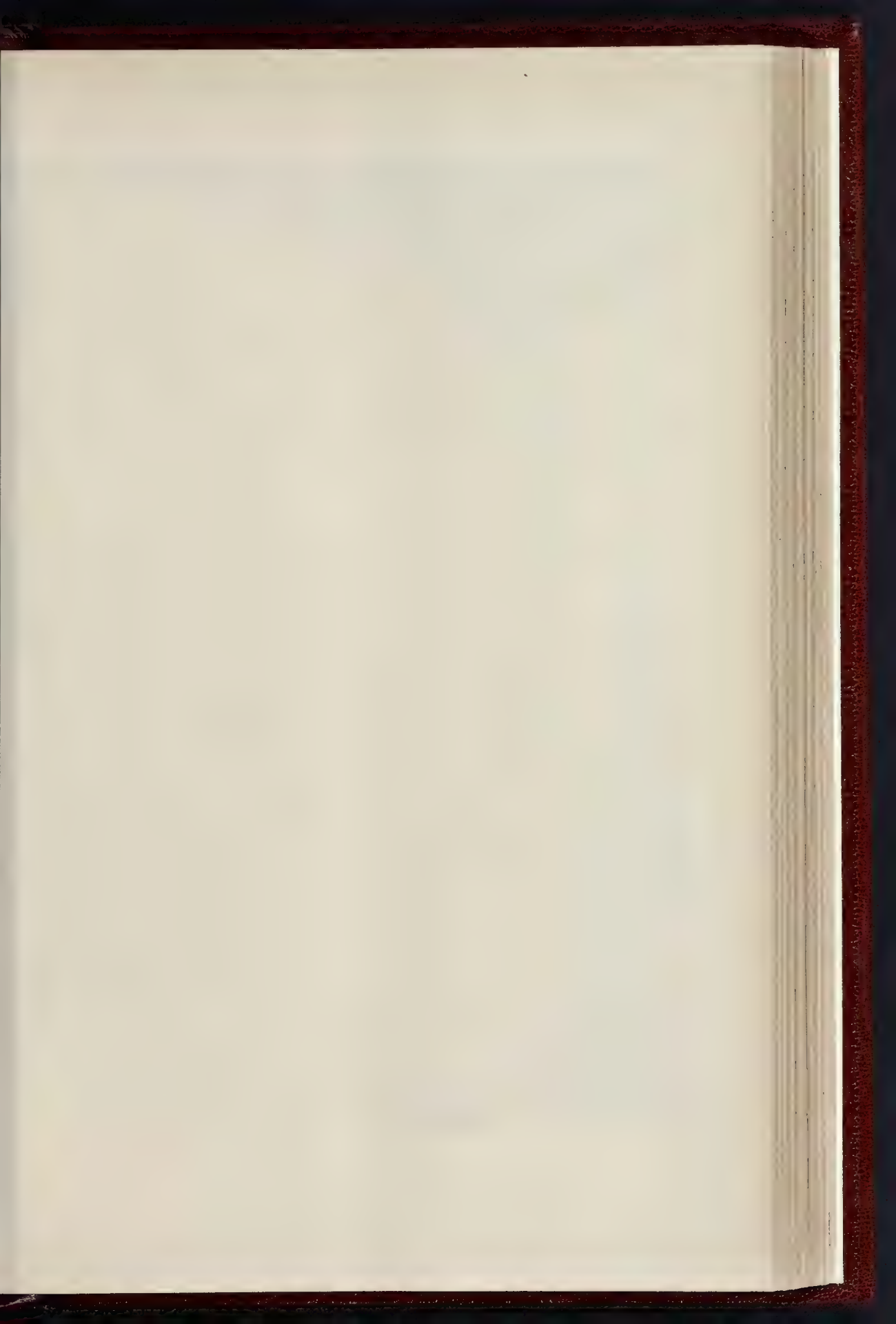


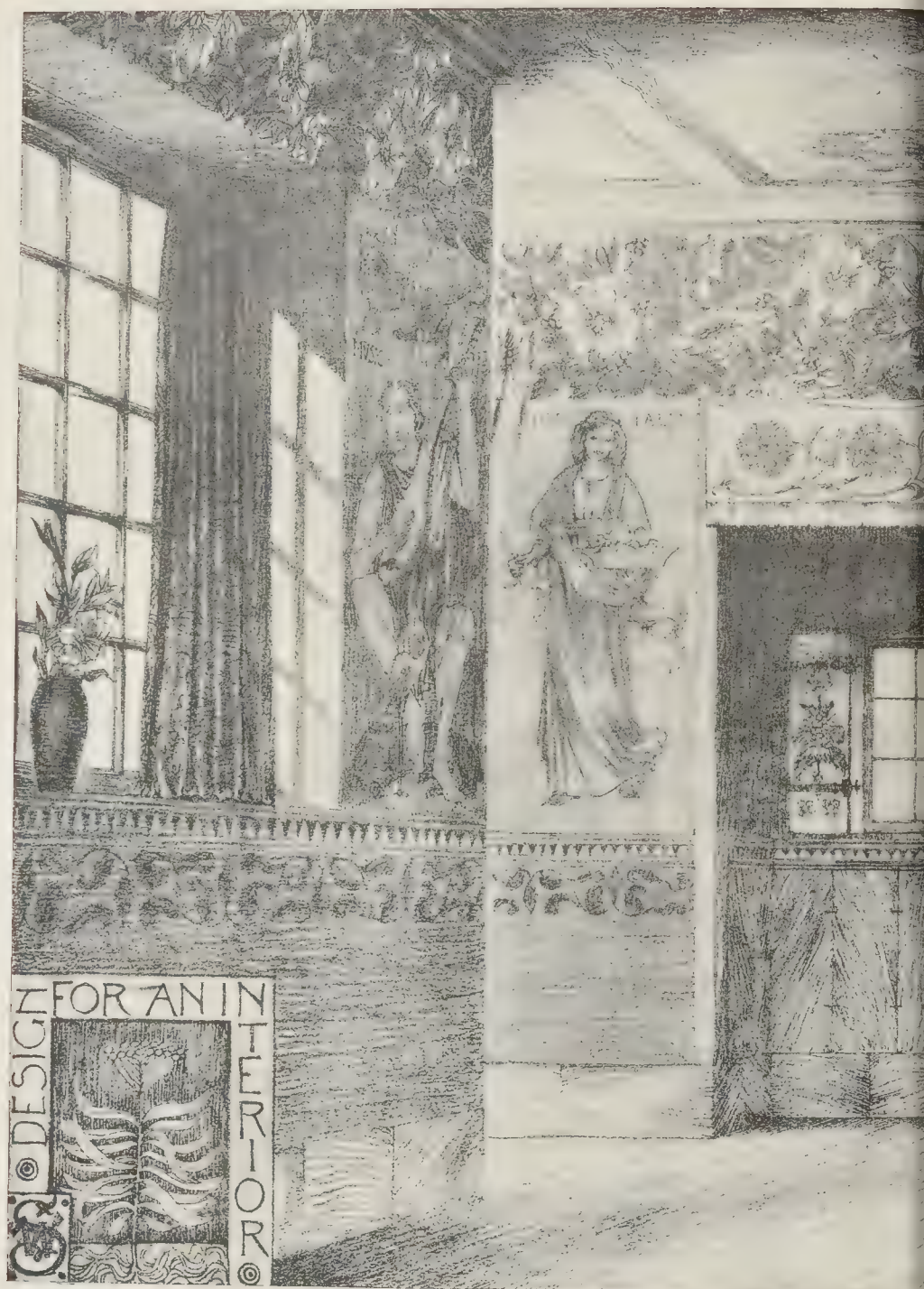
THE WHITE HART, GODALMING

OLD COTTAGE ARCHITECTURE.—FROM SKETCHES BY MR. RALPH NEVILL, F.S.A.













By Mr. W. STIRLING





the building, and the drawing and dining rooms, each of which has a window at the end as well as a large group of windows at the side, stretch northwards and southwards from it, the kitchens and offices being between them at the rear, and all on the ground-floor. There is no basement, and the house stands on a platform of Portland cement concrete 3 ft. thick, and extending 3 ft. beyond the exterior of the walls. There are two floors of bedrooms and one of attics in the roof above the ground-floor. The house is built of stock brickwork, relaid with red bricks at all the numerous angles and as dressings to the openings, besides which a considerable use has been made of stone in arches, lintels, and sills, but the string-courses and copings are mainly of cast Portland cement concrete. The roofs are covered with Broseley tiles, with terra-cotta ridge-crests and chimney terminals.

The design is by Mr. John P. Seddon, and the building has been erected by Messrs. Holloway Brothers, builders, at a cost of about 3,000*l*. In the background is shown a view, taken from the design made by the same architect, for the completion of the tower and spire of the church of Christ Church, and which is intended shortly to be carried out, and for which a fund has been left to accumulate for some years past.

#### OLD COTTAGE ARCHITECTURE.—No. VIII.

In the oldest houses, the jambs, sills, and heads of the windows are generally worked on the solid posts, but very commonly these have all been cut away, and larger frames inserted. Probably, in the course of a century, the sills had perished, and something had to be done, and, as usual, it was found simpler, or suited the workman better, to put in a quite new window than to repair the old. Apparently there was also a desire for more light, or, as is often the case, some of the numerous small lights were stopped up, and a few larger substituted.

A very characteristic feature of the earlier sixteenth-century houses is the manner in which nearly all the spaces between the timbers of a room are glazed, this being the practice condemned by Lord Bacon in the well-known passage in which he complains that one could not tell where to be to get out of the light. These long ranges of light were very picturesque in effect, but the result of the window-tax, and also, possibly, the necessity of repair, has caused most of those in cottages to be closed. There are examples of them in this week's illustrations in the "Waggon and Horses" in the Oakford-road and in Hart-lane, Godalming. The lead quarries from the former have disappeared during the last few years.

The older window-frames are always moulded, the earlier as B, and later as C (fig. 1); it is chiefly in the late insertions that one finds the square flat frames, as D, that have been adopted in some modern work, and by a high authority. The windows of this detail are generally of very inferior work and design as to proportion, although in a few instances where they seem original, as in the house at Milford given in a previous number, the proportions are more carefully studied. It is true that in old work one often sees such detail looking well enough, but the moment one comes across a bit of the older and richer detail, one is conscious at once of the vast gap between the two.

While on the subject of detail, I must call attention to the almost invariable rule in the old windows to give the transom an extra projecting moulding, as A (fig. 1). This gives rich-

lower part of the window. The upper part of the transom is, and should always be, sloped instead of moulded. Trifling details such as this make an immense difference to the effect. Not only is the water thrown off, but one gets the form of the mouldings clearly marked where scribed on each side on the flat surface.

Another most important point in a transomed window is that the upper light should be higher than its width. The exact proportion must vary with the total length of the window, and there is just one short total length where an exact square may be admissible; otherwise one may take it as an absolute rule that the top light must never be a perfect square or wider than its height.

At Tangley Manor the windows are of rich and good detail, but in other places, as far as one can see, they were simpler, though the best

of the manner in which old work may lie concealed. I had myself carefully inspected it some years before with the intention of buying it, and could see nothing but plain plastered walls. When, however, it was pulled down, from behind the lath and plaster appeared excellent oak-panelling and mantelpieces of elaborate character, over which battens had been fixed to carry the laths.

Of the illustrations of this week that of the long building in Church-street is interesting, as it seems to have been built for a row of small tenements, and is not, as is so often the case, a more important house converted to poorer uses. The gable building in High-street was a house of some importance. There was originally a fine coat of arms of stained glass in one of the back windows, which showed that the house belonged to Thomas Hull, who married the

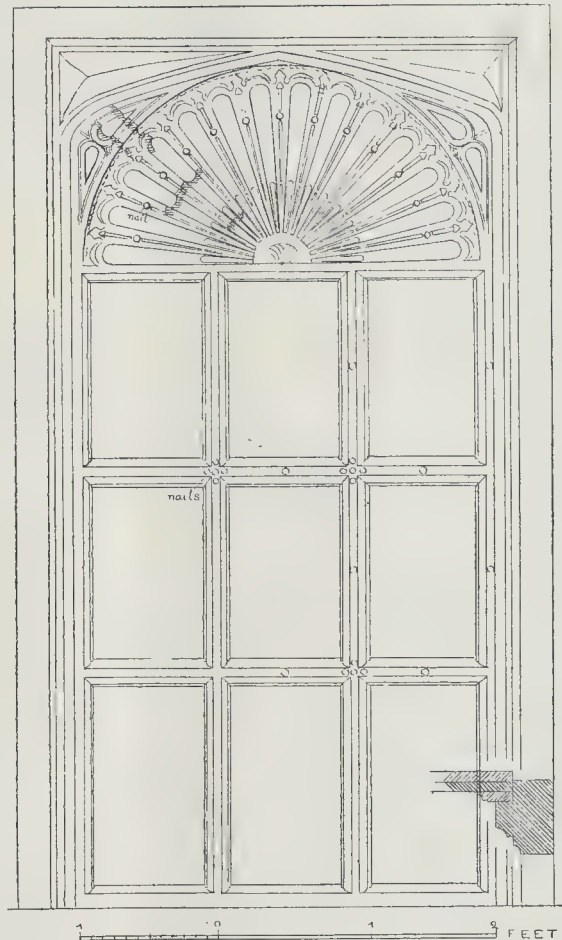


Fig. 2.

of the old work has, doubtless, often been destroyed, and only that of offices and back-rooms been left.

The earlier outer doors are generally of one of two patterns, both of very practical construction. At Guildford there are remaining one or two very interesting doors of more elaborate character, and Abbott's Hospital is a perfect storehouse of fine doors with semi-circular radiating tops. I give a drawing of a smaller similar door (fig. 2) from an interesting porch that formerly stood by the Town-hall at Godalming. This was taken down a few years ago, and I was lucky enough to secure the old door and some interesting panelling and fittings, which have been fixed at Ote Hall, a fine old timber house in Sussex that I restored for General Godman. This house at Godalming supplied an instance

heirress of the Westbrook family, the owners of the important house on the other side of the railway. This piece of glass is now in the possession of Mr. Goeling, of Busbridge Hall. The front of the house is plastered over, but the further gable has quite lately been uncovered and repaired. I am told the curved pieces follow the lines of the old timbers, but that other uprights have not been replaced. The pattern of quartering is similar to that at Unsted Farm.

The barge-boards I illustrated in a previous number.

At the side remains the Tudor arch of the old coach-way to the yard. I give herewith the detail of projecting window-sill.

The "White Hart," a most interesting old house, had probably a similar gateway, as the present passage is a story higher than the

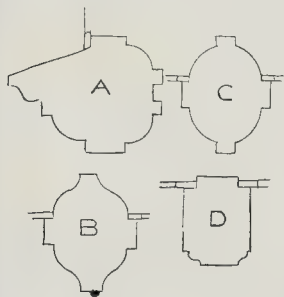


Fig. 1.

ness and strength of appearance, and is very practical, as it serves to throw water clear of the

original. The ground-floor wall was set back 2 ft. from the line of the first story, the present wall being comparatively modern. The shopfronts have been further modernised since the date of my sketch. I give a drawing of corbels under second story (fig. 3).

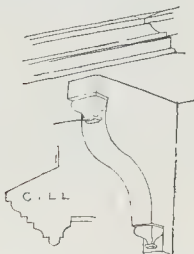


Fig. 3.

The name of that part of Godalming called the Mint is one of the most curious survivals of which I know. There was a mint at Godalming in Saxon times, when the town was a royal vill, and there are extant coins struck here. The name seems to have stuck to this quarter ever since, although coinage must have ceased at a quite early date.

Besides the subjects of my sketches, there are other interesting bits in Godalming not so well suited for illustration, and two very fine seventeenth-century brick houses that I hope to illustrate more fully.

The house adjoining the churchyard has been modernised outside, but inside contains several rooms of good panelling and mantelpieces with coats of arms of the Elliot family. It has also a fine staircase of the same design as that leading to the Warden's rooms at Abbott's Hospital, Guildford.

R. N.

#### THE ASSOCIATION OF PUBLIC SANITARY INSPECTORS.

On the 3rd inst. the new session of this Association was inaugurated by an address given by Mr. Hugh Alexander, who had been re-elected Chairman of the Council. There was a large attendance, and Mr. Alexander delivered an interesting and suggestive lecture on "The Land Laws, and the Operation of Building Leases on the Public Health." Thanks, he said, to the respect, sympathy, and co-operation of the public in the Association's work, and the powerful aid of their President (Mr. Edwin Chadwick), they had good reason to believe that the Association now stood on a platform in public estimation from which great advances might be made. During the new Session of Parliament the promised Bill for the Government of the Metropolis would demand their scrutiny, and the operation of the new Local Government Act would require to be watched in order that justice to their members might be properly secured and the interests of the public health be protected. Attention should continue to be directed to the many anomalies of sanitary law still existing, and to the absence of all statutory definition of the powers and duties of inspectors, or of the qualifications which should be required in all candidates for the position. The greatest danger to the public health arose from the inefficient work of architects, builders, and workmen, and it was held that in future only men properly skilled and trained should be eligible for these appointments. They must return again and again to the discussion of such matters, which were of the first importance, until an examination of candidates should be exacted, based upon knowledge of a more thorough and practical character than that which was considered sufficient for the certificates granted by the Sanitary Institute.

With regard to the operation of the leasehold system and the defective state of the land laws, they went to the very root of sanitary reform, but they were not so well apprehended by the public. If laws to prohibit the pollution of rivers and streams, or of the atmosphere, were just, needful, and of vital importance, it was of not less vital importance to the people that the disposal and use of town lands should be so regulated and restricted by law that the erection of houses unfit for family life should be no longer possible. Unfortunately, the tendency at the present day was to exact terms of the most grinding character in the renewal of

leases, and the earnings of the people were thus as effectually confiscated as they could be if a foreign army was in occupation of the country. It had been proved before the Royal Commission on the Housing of the Working Classes that the system of building leases was a great cause of overcrowding, and was conducive to bad building; and that legislation favourable to the acquisition, on equitable terms, of freeholds would conduce greatly to the improvement of the dwellings of the people of this country. For the objection of Lord Salisbury, that the supply of new houses would be checked by a compulsory sale of freeholds, was met by the obvious reply that the demand would regulate supply. The only considerations allowed by owners to have weight under the present system were, first, how many houses could be packed on the land, in order to augment the ground-rents; and, second, how cheaply could the houses be built, in order that speculating builders might thrive.

Those numbers of unhappy people from time to time were stricken down with fever, caused by defective drains; that others were racked with rheumatism, arising from damp walls; and that warped, shrunken, and ill-fitted woodwork made conditions ruinous to feeble constitutions; that small rooms, unfitted for family life, and improper offices demoralised the people, were all matters unknown to the gentlemen who draw their ground-rent regularly; but that they were matters calling loudly for legislative action in the interests of the public health, admitted of no doubt on the part of health officers.

In a memorandum to the report of the Royal Commission by Mr. Jesse Collings, the evidence of the representative of the Town Council of Bury, and particularly in the report of Dr. Barry and Mr. P. Gordon-Smith on back-to-back houses, some very striking facts were related upon the tenure of town holdings and upon the particular form of construction of dwellings. In some open country districts it was found impossible to purchase land at a less cost than from 4s. 6d. to 10s. per square yard, or at the rate of from 1,089, to 2,420, per acre, although the agricultural value did not exceed from 30s. to 40s. per acre. The fact that the death-rate was twice as heavy in the front houses as in the back ones, which faced the privies, was most instructive, though not easy to account for. In Halifax, Todmorden, Bradford, Salford, and other towns in Lancashire, and particularly in Yorkshire, that class of houses prevailed to an appalling extent. In Bradford alone during the eleven years from 1876-1886, out of 7,036 new houses certified as fit for habitation, 4,486, or 64 per cent., were back-to-back houses, accommodating an estimated population of 20,000 persons.

The remedial legislation should be directed to the securing of the following ends:—

1. With existent houses, in accordance with the recommendation of the Supplementary Report of the Royal Commissioners, power should be given to leaseholders to acquire, on equitable terms, the freehold interest in their property.
2. Land required for extending the boundaries of a township should be declared town lands, and should be subject, as recommended by the Report of the Royal Commissioners, to a rating of 4 per cent. on its selling value, which the Commissioners believe would induce competition amongst owners, and bring land into the market.
3. That land should not be leased for building purposes.
4. As to the construction of dwellings,—that it should be declared by law that no house shall be allowed to be built on any section or plot of land the frontage and depth of which is inadequate to the provision of rooms sufficiently large for the purposes of family life, and to the provision of a proper back-yard and domestic offices, as follows:—
  - (a) The smallest house should have not less than a 20 ft. frontage, and if two rooms in depth, that such rooms on the ground-floor, measured from front to back, should be at least equal to the measurement from side to side.
  - (b) And such house should be provided with an open yard, equalling in area at least half of the land upon which the house is built.
  - (c) Such house should be supplied with a proper water supply, and a proper closet fitted with proper water supply and apparatus for flushing.

A discussion ensued, in which Mr. Tidman, C.E., Mr. J. Thomas (Hon. Counsel to the

Association), and Messrs. Hearne, Fairchild, Dea, Jeffries, and Poulson took part; the proceedings concluding with a cordial vote of thanks to Mr. Alexander for his address.

#### EXAMINATIONS AT THE SANITARY INSTITUTE.

At an Examination held on November 8 and 9, 74 Candidates presented themselves—15 as Local Surveyors and 59 as Inspectors of Nuisances. The written questions were set to be answered in writing on the 8th, and the Candidates were examined *ad hoc* on the 9th.

The following Candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of Local Surveyor:—

|                     |                       |
|---------------------|-----------------------|
| Charles Buntin.     | William Henry Stucke. |
| William Cooper.     | Harold Swan.          |
| A. P. I. Cotterell. | John Henry Swainson.  |

And the following candidates were certified as competent to discharge the duties of Inspector of Nuisances:—

|                       |                         |
|-----------------------|-------------------------|
| Albert E. Adams.      | James Lee.              |
| B. W. Baillie.        | William David Millard.  |
| John Baldock.         | Francis Robert Morgan.  |
| Horace E. Benjamin.   | John Norrish.           |
| William Thomas Bovey. | Thomas Wickford Potter. |
| Samuel Buxton.        | Thomas George Rosa.     |
| Arthur Butterworth.   | Richard Joseph Sadleir. |
| Anthony Buxton.       | James Allen Short.      |
| W. H. Chaney.         | Leo Sunderland.         |
| John Edwin Clark.     | Thomas Thomas.          |
| Alfred Crossley.      | William Edward Thomas.  |
| William Medley Drake. | James Thorpe.           |
| Joseph Gilchrist.     | Samuel Towson.          |
| Alexander Grant.      | Peter Wood.             |
| Charles B. Jones.     | John Wright, jun.       |
| John Kemp.            |                         |

#### INTERNATIONAL EXHIBITION, BRUSSELS.

##### LIST OF AWARDS TO BRITISH EXHIBITORS.

We extract the following from the official list of awards to exhibitors in the British Empire Section of this Exhibition:—

##### Group II.—Liberal Arts.

Class 6.—*Decorative Art*—Lynn, John, Larnie, silver medal; Cochrane-Patrick, H. G., Beith, N. B., bronze medal.

Class 11.—*Hygiene, Medicine, Surgery, &c.*—Jennings, George, London, diploma of honour; Barstow, Jacob, & Sons, Pontefract, gold medal; Maignen's Filter Co., London, gold medal; Godfrey & Cook, London, silver medal.

##### Group III.—Industrial Arts.

Class 12.—*Furniture, &c.*—Graham & Biddle, London, diploma of honour; Jennings, George, London, diploma of honour; Forrester & Son, Longton, special prize; Harrington, J., Coventry, special prize; Justice, H. R., London, special prize; Rottman, Strome, & Co., London, gold medal; Hambury, B., & Co., London, gold medal; Rottman, Strome, & Co., London, gold medal; Harding, W., silver medal; Mallabone, John, London, silver medal; Maw & Co., London, silver medal; Murdoch, T., & Son, Edinburgh, silver medal; Murdoch & Son, Edinburgh, silver medal; Rylands & Son, Limited, Manchester, silver medal; Edgington, B., & Co., London, bronze medal.

Class 14.—*Ornamental Metal Work*, Chubb & Sons, London, gold medal; Harrington, J., Coventry, silver medal.

Class 17.—*Heating and Ventilation*, Jennings, G., London, silver medal; Justice, H. R., London, silver medal; Marsh, Greenall, & Co., Manchester, diploma; Wilson, Co., Leeds, diploma.

Class 18.—*Lighting*—Stott, J., & Co., Oldham, special prize; Doty Lighting Corporation, Limited, London, gold medal; Fourness Regenerative Lamp Co., Manchester, gold medal; Wenham Co., Limited, London, gold medal; Doty Lighting Corporation, Limited, London, silver medal; Marsh, Greenall Lamp Co., Manchester, diploma; Pike, London, diploma.

Group XI.—*Mechanical Industry and Home Work*—Class 33.—*Steam engines and Boilers*—Shanks & Son, Arbroath, special prize; Ruston, Proctor, & Co., Lincoln, two gold medals; Westinghouse Co., London, gold medal.

##### Group XIII.—Civil Engineering and Architecture.

Class 40.—*Civil Engineering*—Chubb & Sons, London, diploma of honour; Brooke, E., & Son, Huddersfield, gold medal; Grayson, Lowwood J., Sheffield, gold medal; Pen-y-Osred Co., Limited, Nantlle, gold medal; Silica Fire-brick Co., Sheffield, gold medal; Justice, P. S., London, gold medal; Glenboig Union Fire-clay Co., Glasgow, silver medal; King & Smith, Weedon, silver medal; Skelsey, Geo. Hy., Hull, silver medal; Titancrete Co., Manchester, silver medal; Transparent Wire-roofing Co., London, silver medal; Engert & Rolfe, London, bronze medal; Elliott, S., Newbury, bronze medal; Hitchins Fire-proof Plastering Co.,



London, bronze medal; Iron and Steel Fencing Co., Limited, Glasgow, bronze medal.  
Class 50.—Ornamental Buildings.—Ter Elst Brick Co., London and Duffel, special prize.

#### FATAL FALL OF A NEW BUILDING: SIX LIVES LOST.

ON Friday, the 9th inst., a new building in course of erection at the West-End of London, at the corner of Riding-house-lane, Great Titchfield-street, suddenly collapsed, killing five of the workmen at once, and seriously injuring fifteen or sixteen others. One of these has since died in the hospital. The inquest was opened by Dr. Danford Thomas, the Coroner for Central Middlesex, on Tuesday last, when the principal witness called was

John Clements Richards, general foreman to Messrs. Oldrey & Co., builders, who said (we quote from the *Times* report) that the old buildings at the corner of Titchfield-street and Riding-house-lane were entirely pulled down, and the new buildings were chiefly composed of bricks, stone, and iron. They commenced the work of rebuilding about nine weeks ago. They had thirty-two men employed on the works, which were to be completed within a given time. The work comprised two houses, 53 and 55, Titchfield-street, but that to be reinstated was only one house, and the one that fell was No. 53. They had completed the house as far as construction (*sic*), and they (*sic*) were being carried out under the supervision of an architect, Mr. Miller, and he considered the whole of the work was proceeding very satisfactorily. On Friday morning he was on the works and he noticed nothing dangerous. Iron-work was used in the building, and the materials generally were good and sound. The roof was put on to the house 55 about a quarter to four on Friday afternoon. Witness continued: I was in No. 55, in my office, when a clerk came to speak to me, and said I was wanted. On going out of the door, with the intention of going up to the roof of 53, I heard a rumbling noise and thought that it might be that the large tank on the top scaffolding might have fallen. The bricks and the mortar and all the materials were good; but we had a great deal of wet weather. When the building fell I was at the door of 55. I could not tell the cause of the collapse. The works were being carried out under the supervision of the architect, who acted also as clerk of the works, and they were carried out in accordance with the specifications he had drawn. I could not form any opinion as to the cause of the accident. The District Surveyor visited and inspected the works. I should think, about once a week. I believe I have seen him there seven or eight times. The witness, in a severe cross-examination, stated that they had a foundation of 3 ft. of concrete, and it\* was bound by girders to the adjacent houses in Riding-house-lane. The mortar was properly mixed with lime and sand. The materials were good. He worked from the architect's specifications and not from any ideas of his own. He did not consider that the mortar was of such an inferior character that on being pressed in the fingers it crumbled like dirt. Mr. Miller, the architect, had a clerk named Freeman. He might have been more frequently there than Mr. Miller himself. The party-wall of the adjacent house in Riding-house-lane was underpinned before the footings of the new buildings were put in.

George Winter, a bricklayer, said he had been working on the fallen premises for a month or six weeks. He understood the character of mortar. That used in this building was good mortar. He neither heard of nor saw anything wrong in the construction of the building. He looked upon the building materials as good.

Other evidence having been given, the Coroner said he should adjourn the inquiry until the 28th inst., and in the meantime have the plan, the specification, and the *débris* of the building practically and professionally examined with a view, if possible, to arrive at the conclusion as to the real cause of the accident.

**Cologne.**—Prof. Frentzen, of the Technical High School, at Aix-la-Chapelle, having obtained the first premium in the "Universal" competition for the new great Central Railway-station, at Cologne, has received a year's leave of absence from his professional duties in order to work out the details of his design, which has been finally adopted for immediate execution.

\* We presume "it" means the house walling, not the concrete.—Ed.

#### LINE OF FRONTAGE.

GILBERT P. THE WANDSWORTH BOARD OF WORKS.

IN this important case, recently heard in the Queen's Bench Division of the High Court of Justice, before Lord Coleridge and Mr. Justice Cave, Mr. R. O. B. Lane appeared, by way of case stated, against an order of the magistrate at Wandsworth directing the demolition of a house, No. 149, Sugden-road, Clapham Common, under section 75 of the Metropolitan Management Act, 25 and 26 Vic., cap. 102, enacting that no building should, without the written consent of the Metropolitan Board of Works, be erected beyond the general line of building in the "street, place, or row" of houses; and that any building erected without such consent might be demolished. It appears from the *Times* report that Sugden-street and Marney-street had been recently laid out on a newly-formed building estate, parallel to each other, and at right angles to Clapham-road. The Superintending Architect certified on February 13, 1888, as to what was the general line of building in Clapham-road, at which date the house now under discussion was not as yet erected. As now erected it was in line with the rest of the row in Sugden-street and faced that street, and had no means of access except from that street, but projected beyond the line in Clapham-road. The general line of building, as certified, in Clapham-road was at a greater distance than 50 ft. from that road; the house in question was less than 50 ft. from that road. On April 13, after hearing the evidence of the Board of Works, the magistrate ordered the house to be demolished, as being a building in the "street, place, or row" of houses in the road, and projecting beyond the general line of building in the road, and within 50 ft. of the highway. Mr. R. O. B. Lane largely relied in support of his contention upon the case of *Barlow v. The Vestry of Kensington* (11, "App. Cases," H.L., 257). In that case the appellant (against an order directing the demolition by the vestry of his house) lived in a house at the corner of the Kensington-road and a new street, called De Vere-gardens. The site of the house, abutting on the eastern side of De Vere-gardens, projected beyond a row of houses on that side of the gardens. The Superintending Architect to the Metropolitan Board of Works certified that the main front of that row of houses in De Vere-gardens was the general line of building in the gardens, but did not decide that that was the general line of buildings either of the row or street in which appellant's house was situated. The House of Lords, reversing the decision of the Court of Appeal, held that no offence under section 75 had been committed, and that there was no jurisdiction for the magistrate's order directing the demolition.

After hearing Mr. Lane at considerable length,

The Court gave judgment, without calling upon Mr. Meadows White, Q.C., who (with Mr. Earle) appeared for the Board of Works.

Lord Coleridge said the case had been ingeniously argued. If appellant's contention was correct, immediate legislation would indeed be at once necessary. Here the Architect had certified to the building line; this building had been found to be within the building line so ascertained. It was not denied that this building was one which, if it faced Clapham-road, would be in Clapham-road; but it was urged that it was, facing as it did to Sugden-road, not in Clapham-road but in Sugden-road; and, therefore, that the building was not an encroachment such as could be ordered to be removed. So to hold would practically nullify and render nugatory all the provisions of legislation upon the matter. It was found as a fact here that the building was within the building line, and also that it was situated in Clapham-road; hence it was within the prohibition of section 75. On an expression in section 13 it was sought to found an argument, which was too subtle, that there was a difference between a finding that "the site of a building" was in such and such a street and a finding that a "building" was in such and such a street. This decision in no way clashed with the recent decision of the House of Lords in the *Kensington* case, *Barlow v. The Vestry of Kensington*, by which, even if they were disposed to differ, this Court was bound, and with which he entirely and respectfully concurred. It seemed to be a decision not only sensible but obviously sound. There it was held, as might have been expected, that the house alleged to encroach on the line of De Vere-gardens was not in De Vere-gardens, nor subject to observe the general line of buildings in De Vere-gardens; and, in consequence, that no offence had been committed under Section 75 by the building of the house, and that there was therefore no jurisdiction for a magistrate's order under that Section directing the demolition of the projecting part. The present case differed widely from that. The Architect's certificate was here distinct and final, as laid down in "Spackman v. Plumstead Board of Works" (10, "App. Cases," 229), and the magistrate's order, based upon that certificate, unquestionably right. The appeal must therefore be dismissed with costs.

Mr. Justice Cave concurred.

#### ST. HILDA'S CHURCH, SUNDERLAND.

SIR,—Will you permit me to ask whether any reader or competitor has ever heard the result of the above competition? I have expected to hear something of it in the professional journals, but I have not seen anything. The conditions stated that Mr. Christian should be asked to select the two designs he considered best, and the Committee would select one of these two. All that I have ever heard was when my designs were returned, and that was that mine was not one of the two selected by Mr. Christian. But I think the Committee ought in good faith (if they have not done so) to give both the mottoes and names of the two selected by Mr. Christian, and which has been finally selected, that both Mr. Christian and the competitors may see that the matter has been honourably and fairly conducted. I presume that the competitors could demand so much.

I at least do not feel satisfied to hear that mine was not one of the selected, and no more.

A COMPETITOR.

#### WARNING VILLAGE CHURCHES.

SIR,—In answer to your correspondent [p. 345, ante] I would say that Gurney's stoves, though the best of their kind, are not fit for churches; the warmth they give is necessarily localised, and they generally ugly the building with a hideous black smoke-pipe—an eyesore inside the building as well as outside. Get rid of such by all means. To my mind there is but one thoroughly efficient mode of warming a church, and that is by the small-bore hot-water pipes (Bacon's patent). This, like every other warming apparatus of any service, needs an underground chamber and a chimney. There is no reason why people should be so ashamed of a chimney in connection with a church; as a necessity, it is as justifiable as windows, seats, or any other part of the edifice. It is not a thing, of course, to be pushed into prominent notice on an east or west front, but deserving of careful and honourable treatment. However, in the case under notice, it is to be supposed that an underground chamber cannot be got inside the building; then get it outside. Sink in churchyard and build, like a vault, a chamber, say 7 ft. square and 7 ft. deep, with arched top and chimney-flue, and a flight of steps at one side. From this lay a drain-pipe, with lidded top, to church, to carry the heating-pipes, these being enclosed carefully in a non-conducting envelope. The pipes could be conducted into and along a grating-covered channel in the gangway of church or carried above ground round walls and seats; the pipes, being so small, are not an eyesore. Thus the building is warmed everywhere, and not, as with the stove, in one isolated spot. Of course, the position of the warming-chamber must be controlled by the circumstance that it must be on a spot free from graves. On the north side of churchyard has no graves; in such case there is no difficulty. The system of small-bore pipe is efficient and inexpensive, the boiler being but the end of pipe made into a coil, and takes up but little space.

PHILIP E. MASEY.

#### CHURCH-BUILDING NEWS.

**Bo'ness.**—Bo'ness Parish Church, which has been built recently at a cost of over 6,000*l.*, from the designs of Messrs. Thornton, Shiels, & Thomson, Edinburgh, was opened for public worship on the 14th ult.

**Bournemouth.**—A new pulpit is about to be erected in the Church of St. Michael, Bournemouth. The design is Early English. The body of the pulpit is octagon on plan, entered by a short flight of six steps from the north transept. It stands on a circular central base-shaft and a base arcading. On five faces of the octagon are panels designed by Mr. W. J. Warren, artist, of Bournemouth, sculptured in the following subjects:—Central panel: "St. Michael." "Jacob's Dream," "Lot's Escape," "Apostles Sent to Preach," "John and the Angel." A carved cornice runs round the top of the pulpit, and a book-desk forms a canopy over the central figure. The pulpit will stand in the same position as the old one, close to the east respond of the north arcade of the nave. The handrail and scroll-work to steps will be of brass and hammered iron, the steps themselves of polished Hopton Wood stone. The interior of the pulpit will have oak floor, linings, and inner capping. The cornice will be of mottled dark Ashburton marble (red and grey); the book-desk, canopy, and body of pulpit of alabaster; the sculptured panels of white alabaster; and the small shafts in arcade of green Devonshire marble. The central base-shaft will be of red Ogwell marble, and the base arcade of bird's-eye dark Ashburton marble (dark grey). A contract has been entered into for the execution of this work with Messrs. A. W. Blackler & Son, of Torquay, for the sum of 250*l.* Mr. Reginald G. Finder, of Bournemouth, is the architect.



*Norton Canes.*—Early in the present year the parish church at Norton Canes was destroyed by fire. The old church was insufficient to accommodate the inhabitants of the growing district, and it was decided to enlarge the building, and add other improvements. Messrs. Osborn & Reading, of Birmingham, were instructed to prepare plans, which were approved, and the work has been carried out under their supervision. The contractors were Messrs. Treasure & Son, of Shrewsbury, and the estimated cost of the restoration is 2,300*l*. The style is Late Decorated. A new aisle, transept, organ-chamber, and vestry have been added, and a baptistry formed under the west tower, opening into the nave by an archway. The new aisle arcade consists of four arches, which occupy the position of the outer wall of the old building, and a new outer wall about 10 ft. from these arches extends the whole length of the building. The church is built of Hollington stone. The roofs are open-timbered, and covered with dark red Staffordshire tiles. Messrs. Minton & Co. presented the tiles for lining the walls of the sanctuary, and the chancel floor is also laid with their encaustic tiles. The building is fitted throughout with open pews of pine, and the interior woodwork is stained and varnished. The reredos and lectern are of oak, and the pulpit and font of Caen stone, all of which have been supplied by Messrs. Jones & Willis, of Birmingham. The windows are glazed with plain cathedral glass, with coloured top-lights. A new organ has also been provided by Messrs. Nicholson & Lord, of Walsall. The church was reopened on the 22nd ult.

#### STAINED GLASS.

*Histon* (near Cambridge). Another Munich stained glass window has now been added to the series already in this church. It consists of three lights, each containing a subject typical of our Redeemer, viz., "The Sacrifice of Abraham," "The Raising of the Brazen Serpent," and "The Ascent of Elijah." The window is by Mayer & Co.

*Hounslow.*—The Church of St. Stephen, Hounslow, has received an addition to its stained glass of two windows, from the studio of Mr. Taylor, of Berners-street, representing St. Thomas and St. James, studies from Leonardo da Vinci's picture of "The Last Supper."

*London.*—The Worshipful Company of Wax-Chandlers have enriched their hall, in Gresham-street, with a stained-glass window, from the studio of Mr. Taylor, of Berners-street, containing their arms, granted in the time of Richard III., surrounded by those of members of the court.

*Long Crendon.*—A five-light east window, with new stonework, has just been placed in St. Mary's parish church, Long Crendon, Thame, Oxon. The subjects represented in the lights are the Nativity, Baptism, Crucifixion, the Angel at the Tomb, and the Ascension; while in the rose above is the Agnus Dei, surrounded by angels. The work has been designed and executed by Messrs. Mayer & Co.

### The Student's Column.

#### ARTIFICIAL STONES. -XX.

##### Asphaltic and Tar-containing Stones.

**A**SPHALTIC division of our subject embraces those stones or compositions in which asphalt, bitumen, pitch, or tar forms prominent ingredients, and includes a few patents of interest. Asphalt itself has been known from very early times, and is referred to as bitumen, mineral, or Jew's pitch, by ancient writers. It is supposed to have constituted the "slime" employed instead of mortar in the building of the Tower of Babel, and also to have been used for waterproofing the ark of bulrushes in which the infant Moses was placed. The substance is found in various parts of the East, in Trinidad, Peru, California, and in Europe, where the chief deposits now worked are those of Seyssel, near the Rhone, where about 1,500 tons are obtained annually, and of the Val de Travers, in the Canton of Neuchâtel, Switzerland. Asphalt is of complex construction and evidently a product of the decomposition of vegetable matter; its melting point is about that of boiling water, and, when cold, it forms a smooth, hard, somewhat brittle surface. Much of the so-called asphalt used for paving streets, bridges, covering roofs, waterproofing

tanks, &c., is not the natural product, but an artificial one composed of asphalt mixed with pitch and gravel or finely-powdered bituminous limestones, such as that found near the Jura Mountains. This "asphaltic mastic," as it is called, laid down hot, becomes firm and hard on cooling.

"Lyons Asphaltum" is composed of asphalt 15 parts by weight, coal-cinders 35 parts, powdered coke 10 parts, lime 130 parts, and fine gravel 160 parts. The asphalt and coal-cinders are mixed in a boiler, heated, and skimmed until the formation of froth has ceased; the powdered coke and lime are then intimately mixed and heated to 575° Fahr., and when quite dry incorporated with the ingredients in the boiler, after which the gravel is added.

The earliest patented application of asphalt is that of Admiral the Earl of Dandonald, who, in 1851, patented the employment of Trinidad asphalt and mineral bitumen of the North American Colonies in the production of artificial stones and other useful objects.

Pym's composition, patented in 1855, was composed of 5 cwt. of asphalt, 5 cwt. of chalk or limestone, 1 lb. of sal ammoniac, and as much coarse sand and grit as will mix freely with the above ingredients when heated in a cauldron; the heated mixture is then cast into the desired forms, and if extra toughness is required cocconut fibre, shavings, or other fibrous materials must be well incorporated.

In Rowcliffe's patent (1855, pat. 2,906), the asphalt is reduced to small particles, and compressed by hydraulic or other pressure into the desired shapes; sand or powdered stone may, if necessary, be added to it before compression. Shell's stone, patented in 1867, consisted of small stones cemented together with asphalt.

A portion of Pear's specification (1865, pat. 2,759), part of which has been already dealt with, relates to a combination of the oxides of iron and asphalt with lime or cement and sand, with or without gypsum, gravel, &c.

R. Skinner's patent asphalt blocks are prepared as follows:—800 lb. of asphalt are placed in an oven and submitted to sufficient heat to drive off water and easily volatilised matters. In a short time the material is capable of being easily powdered, and in this state it is introduced into a large revolving cylinder heated up to 200° Fahr., and then are added 300 lb. each of pulverised slag, coke, and limestone, and about 20 gallons of mineral tar. The tar should be previously boiled to expel water, and thoroughly mixed with the limestone before being added to the other ingredients. After mixing and heating, the product is conducted from the revolving cylinder to a revolving pan and the temperature lowered to 150° Fahr.; in this state it is placed in moulds and subjected to heavy pressure.

Tucker, an American patentee, also compresses mixtures of slag and asphalt into blocks.

Pottrel's patent (1873, pat. 3,086) prepares an artificial stone especially adapted for making drains, pipes, &c., by boiling together a mixture of 13 cwt. of finely-powdered stone, 4 gallons of shale oil, 2 cwt. Trinidad asphalt, and 2 cwt. of bituminous rock. When thoroughly mixed, the composition is run into suitable moulds.

Some authorities state that it is far better not to melt asphalt with heat, but to use solvents such as carbon bi-sulphide, naphtha, or benzine. These substances evaporate readily and leave a fine hard coating or varnish of asphalt, but it must be borne in mind that the use of such extremely volatile and inflammable solvents involves considerable risk.

Keltman, in his improved process (1884, pat. 12,425), produces a more homogeneous material than is usually obtained. He proceeds as follows:—Crude asphalt is heated with hydrocarbon oils, and impurities are got rid of by deposition; the quantity of oil used is such that, at a temperature of from 17° Cent. to 33° Cent., the bitumen should be capable of being drawn into threads; limestone, ordinary or bituminous, is powdered and mixed with about 40 per cent. of water, forming a thin cream; 15 per cent. of the asphalt or bitumen, at a temperature of 70° Cent., is then added, and the whole well incorporated; finally, the temperature is raised to expel the water, and the liquid mass is cast into blocks, which when cooled are ready for use.

Tar and pitch paving and stone-making compounds are often confounded with those made with asphalt, though in reality they are a totally distinct and inferior class. The following

mixtures have been patented:—Gas-tar mixed with mud or slime from the bottom of rivers, canals, &c., finely divided peat, and a little dry sand or gravel formed a compound patented in 1843 by C. Bertram, of Newcastle-on-Tyne. Williams, in 1851, proposed the use of a mixture of rosin, pitch, and sulphur melted together, to which was then added gypsum, lime, sharp sand, gravel, breeze, broken brick, stone, or other hard material and a little dead oil.

W. Hutchinson patented, in 1855, a dark artificial stone made by boiling coal tar until all water is driven off and then adding perfectly dried waste pieces of stone, chalk, or gypsum; the boiling is maintained for some time until the materials are completely saturated, they are then withdrawn, crushed to powder, and compressed into moulds of desired shape while still hot. A lighter coloured stone can be obtained by substituting rosin for tar. Stones produced in this way are said to be impervious to moisture and vermin, and very hard. Provisional protection only was granted in 1861 for a mixture of pitch, lime, and gravel. McDonnell's improved concrete, patented in 1868, was a combination of ground stone, chalk, lime, grit, shingle, broken stones, of all sizes and descriptions, with pitch or tar and ground burnt clay.

The Rev. G. H. Forbes, in 1873, prepared a cement for making artificial stones which may be included here, though the finished product is free from tar, being formed by burning together a mixture of tar, pitch, or bitumen with Portland, Roman, or other cement. After grinding, the cement is mixed with water and moulded as required.

A bituminous mortar, or stone-forming material, used in America, especially in the petroleum districts, is made by utilising a kind of pitch, or bitumen, obtained as a by-product in the manufacture of paraffin oil; this is mixed, in a melted state, with a powder composed of one part good slaked lime, and two parts sharp quartz sand.

W. E. Constable's "London Artificial Asphalt" (1886, pat. 3,832) is formed by crushing hard limestone, and heating to about 130° Fahr. to remove moisture; to every ton of this dried material is then added about twelve gallons of distilled tar (free from oil, creosote, and water), and the resulting mixture is stored for at least three months; to this preparation, as a base, lime, sulphuric acid, and bitumen are added to complete the formation of the artificial asphalt.

#### Books.

*Historic Towns.* Edited by E. A. FREEMAN and W. HUNT. *Cinque Ports.* By MONTAGU BURROWS. Longmans.

**I**T is not often that an Oxford Professor can establish a claim to be heard as an authority on naval matters; but the author of this interesting little volume is both a Captain in the Navy and the Professor of Modern History in the University of Oxford. As a diligent antiquary and attractive writer he is already well known, but it may be doubted whether he has ever found so suitable a subject for the employment of his pen as the history of the Five Ports which, long before a National Navy was thought of, maintained the supremacy of England in the Narrow Sea, and defended our coast at its most vulnerable points. It is not easy to realise the fact that five centuries ago, Sandwich, for example, occupied a position scarcely less important than Portsmouth now holds. It was there that the squadron which in 1347—a squadron consisting of 710 ships and 14,151 men. Sandwich itself contributed no less than twenty-two ships and 504 men to the force, and places as significant as Rye and Winchelsea sent contingents of no mean character, whilst the quota from Portsmouth numbered only five vessels, and London but twenty-five. We must, however, go much further back than five centuries ago for the origin of the Cinque Ports—Hastings, Sandwich, Dover, Romney, and Hythe. They formed a Confederation, similar in some respects to that of the Hanse Towns, partly for trading and partly for defensive purposes. They were charged with the guardianship of the English shores and the passage to the Continent, and in acknowledgment of these services, which were distinctly feudal, were allowed unrivalled privileges and invested with peculiar honours. The Confederation "has



enjoyed the singular felicity of having taken on the one hand a leading part in establishing the constitutional liberties of England, and on the other, of having supplied the chief weapon used by its kings in the consolidation of its territory, and the restoration of its sovereignty in the Narrow Seas." Indeed, it may be said with truth that out of the Navy of the Cinque Ports grew the Royal Navy of Great Britain.

Whether the Confederation is to be traced back to Roman times and is to be regarded as the outcome of the fortresses planted by the Romans on the south-eastern coast, or whether it was a Teutonic organisation, we cannot say with positive certainty. This, however, is abundantly clear. The five ports were recognised by Edward the Confessor, and, one and all, derived their charters from him, but with the Conquest their importance was largely augmented and their history may be said to have begun; for one result of the Conquest was to turn the British Channel into an Anglo-Norman arm of the sea. It was the means of communication between those possessions in England and France which were governed by the same monarch, and the service of the Cinque Ports was to keep the line open and protect the trade that was carried on between the divided parts of the same empire. Thus we can readily understand why it was that when Richard I. collected his naval armament for the invasion of Palestine it was not from the Cinque Ports but from the south and west of England and from Anjou that he drew his forces. The Confederation existed for quite different purposes, and formed, in fact, a naval militia—a home squadron charged with defensive duties which the absence of the king rendered more than ever necessary. When, however, the intercourse between England and France changed its character, the duties of the Confederation changed with it. Their ships were then employed for aggressive purposes, and the victories gained by them over the French in the thirteenth century are among the most brilliant in the annals of naval enterprise.

Professor Burrows goes so far as to say that the battle won by the Cinque Ports navy, under Hubert de Burgh, in 1218, was, in its result, "not inferior to the success of Trafalgar." It destroyed at once all hopes that Lewis had formed of the English crown, and placed the throne of the youthful Henry III. in a state of security. The important part which the Cinque Ports took in the struggle between Simon de Montfort and the King we have not space to notice; but there is something significant in the extreme leniency with which Edward dealt with them,—and even with Winchelsea (which had long defied him),—when the baronial insurrection had been brought to a close. Edward thoroughly appreciated the value of the help they could give, and spared no pains to draw towards himself their loyal spirit. He was well rewarded. Their fleet did him signal service in his Welsh expeditions. The reduction of the island of Anglesey was principally their work, and the King recognised their faithful service in a new Charter, which confirmed and extended their ancient privileges.

At the end of Edward III.'s reign the decline of the Cinque Ports began. Various circumstances contributed to it, but amongst the most important were certain physical changes which, long resisted, at last proved irresistible. It should be borne in mind that the importance of these littoral towns was largely due to their position. The approach to London in early times was not, as now, round the Forelands and by the Thames' mouth, but by means of the river Wantsum, which, flowing between Reculver and Richborough, made the Isle of Thanet actually insular. The Wantsum by degrees became filled up. Richborough perished, and Sandwich took its place. But Sandwich, in its turn, shared in the same fate.

"The fatal influx of choking sand may be said to have waited upon the growth of London. As long as its two Kentish outposts were of real importance for that growth, the sea was their obedient vassal; but when the great city had risen beyond the need of such help, by the time that Sandwich had proved its superiority over its rival and become the chief rendezvous for Royal fleets, the eastward drift began to produce its ruinous effects. Co-operating with the causes which were acting on the Wantsum, the sand, which was held in suspension by the tides long after they had deposited their burden of shingle, washed more and more into the bay, till in its progress to the east mouth of the Stour, which had been at Sandwich, was driven null by mills in the same direction as the sand. The river, helplessly yielding to compulsion, having long reached the limit of endurance, debouches, after a course of nine miles, under the cliffs of Thanet, by Pegwell Bay, and the famous bay of Sandwich has long become one expanse of sand, which cuts off from the sea by some two miles or more of dreary waste, one of the most interesting towns in England."

Of course, these changes were slow in operation, and did not affect all the Ports in equal measure. Winchelsea, for example (which was one of the two ancient towns admitted into the Confederation after the Norman Conquest), lost its proud position through other causes. The old town stood upon an island—a mere strip of sand exposed to the irruption of the sea, and needing constant attention for its sea-walls. It had a fine harbour, grew populous and important, and its inhabitants, perhaps through their constant struggle with the invading sea, were the boldest seamen on the coast. The town gave shelter to Earl Simon, and thus provoked the vengeance of Edward. In spite of its gallantry it could not long resist the greatest general of the age; and then, half-ruined by war and wind and waves, it was entirely swept away in 1287 by a tempest and inundation which changed the course of the river Rother, and with it the whole face of the Romney coast. New Winchelsea, which the king himself built on the higher ground of the neighbouring promontory, met with other enemies. French and Spaniards assailed it. Its walls were left unprotected, and fire on more than one occasion ravaged its streets. The dissolution of the monasteries gave the final blow by destroying the two Religious Houses which still gave it importance. In 1601, Raleigh speaks of the place as "gone to decay," and the tourist of to-day, who delights in its picturesque features, repeats the verdict.

Those who regard with pride and interest the history of England can scarcely do better than visit these Ports, with this hand-book as their companion, and see with their own eyes the spots where history has been made.

*Études d'Archéologie et d'Art.* Par OLIVIER RAYET, réunies et publiées avec une notice Biographique sur l'auteur par SALOMON REINACH, et illustrées de cinq photographures et de 112 gravures. Paris: Firmin-Didot et Cie. 1888.

THESE archaeological studies will probably be widely read, not only in France, but by the educated public in England. M. Rayet is well known as a cultivated amateur, who has done something to add to the resources of science, and very much to make those resources known to the world at large. The contents of this memorial volume are miscellaneous enough, ranging from a discussion of an unedited fragment of the "Table Iliaque" to an article on the Sculpture of the Salon, 1880. Some of the articles are much too slight to call for reprint, as their interest was of a wholly passing kind; such is the review of Dr. Benndorf's book on Greek vases. Perhaps the most valuable are those which give a popular summary of great systems of excavations, such as that on the excavations at Olympia and Dodona; or, again, those which give some general notion of the contents or specialties of particular museums, such as the article on the Hermitage antiquities and the Trocadero Exhibition.

*Hot-Water Supply: A Practical Treatise upon the Fitting of Hot-Water Apparatus for Domestic and General Purposes.* By F. DYE. London and New York: E. & F. N. Spon.

THIS little manual, of about eighty pages only, is one of the most useful that have come under our notice for some time. Hot-water circulating systems are now used so much more extensively than was formerly the case, that it is the exception to find a new suburban house of 40l. per annum rent without its bath and lavatory with hot-water laid on, and in no part of the building is cheap work and scamping so difficult to discover, so awkward to rectify, and so conducive to dangerous accidents as in the hot-water circulation. In the houses which are erected under professional supervision, it is scarcely too much to say that the architect, in ninety-nine cases out of a hundred, contents himself with specifying a certain sum to be provided for hot-water supply, and he is absolutely dependent upon the men who carry out the work for its success or failure. A careful study of the book under notice would, we believe, prevent this, and would enable an architect to write a full specification of the work required for hot-water supply, and would teach him where to look for evidences of bad workmanship, and it would also give the skilled artisan, who has a practical acquaintance with his work, that knowledge of scientific principles which would teach him why one way of doing a thing

is better than another. The various kinds of boilers are first described, and the absolute necessity of periodical cleaning out in London, and the South of England generally, is forcibly insisted upon, as the majority of failures are due to the neglect of this precaution; in fact, we believe that it is the exception for householders to see to this being done. We cannot hold the London water companies altogether free from blame in this respect. They supply the water with all its imperfections, and do nothing to warn those who use it of the risks attending its use. It would be the simplest possible thing for the companies to supply to every house when the water is laid on a card of instructions as to cleaning out boilers and cisterns, and this would call the attention of the householder to what he is at present quite ignorant of. Tanks and cylinders, pipes and cocks, are next described, and the desirability of having large cocks and large waste-pipes for baths is pointed out. A simple and clear explanation of the phenomena of hot-water circulation is followed by a general description of apparatus which deals fully with many practical matters relating to the position of the flow and return pipes and their connexion with the boiler. The cylinder system is said to be of American origin, but it has certainly been in use for many years in the North of England, although near London it is much more rarely used than the tank system. The advantages of the cylinder system seem to be that the cylinder can be placed near the kitchen-range, and kept much warmer than a tank, and chiefly that, as it cannot be emptied when in general use—all draw-offs being taken from above the top of it—there is no fear of the boiler becoming empty should the cold-water supply fail. A very useful chapter is devoted to the cause of explosions, which are, 1, failure of water-supply; 2, frost; 3, stop-cocks; and 4, incrustation; the second being by far the most frequent. The necessity for some kind of safety-valve near the boiler, and the desirability of packing the pipes with some non-conducting material are pointed out. On the question of hot coils, we quite agree with the author that it is much better to use an independent boiler for the coils rather than to connect them with the ordinary circulating system. We can confidently recommend the book, as it is concisely written, and is evidently the work of a man who understands practically what he writes about.

*The London County Council, its duties and powers according to the Local Government Act of 1888.* By GEORGE LAURENCE GOMME, F.S.A. London: David Nutt. 1888.

THIS small book appears to be one of the best of the guides through the labyrinth of the Local Government Act, of which several have already appeared. It is arranged in the form of a kind of alphabetical dictionary, giving under each word a brief résumé of the meaning and effect of the Act as bearing on that subject. It is calculated to save a great deal of trouble to persons wishing to ascertain the working of the Act in regard to any special point.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

14,384, Water-closets. R. and W. J. Hookings. To render waste-water used for flushing less liable to be soiled, and to form a more effective flush, the water is, by this invention, received in a reservoir until a sufficient quantity accumulates, when it is discharged into the closet.

14,543, Incombustible Scenery for Theatres, &c. E. Tepper.

According to this invention, curtains, soffits, and projecting pieces of all kinds are made of an incombustible material, i.e., wire gauze that is impregnated or covered with paint, which completely fills up the holes and renders it opaque.

15,728, Cutting, Grooving, and Beveling Wood. G. A. Oncken.

A continuous board (not veneer) is, according to this invention, cut from a round or cylindrical log of wood rotating upon its axis by setting a vertical knife, which is continually displaced towards the axis of the rotation of the wood, and also the rotating wood itself, in horizontal oscillations upon different centres, for the purpose of causing a to-and-fro movement of the cutting edge of the knife at the cutting line of the block, thereby producing a better cutting effect. A device for cutting chimes, or grooves and chamfer, is also connected. The machine is a powerful one, provided at the two ends with steam cylinders, distributing gear, cross-head



and connecting-rod, which is applied to the crank pin, and thus actuates the driving-shaft direct.

16,048, Window-sashes, &c. Thos. Wilkins.

In place of balancing the sashes, a mechanical multiplier, to gain extra power for the hand, is used by this inventor. The form preferred is that of the well-known device of a shaft of pulleys. The sash is suspended from above by two cords, each of them passing over a pulley, keyed or otherwise fixed to a spindle running in bearings. A break actuated by a cord is also affixed. When the sash is required to be opened, the break cord is pulled, the pulling cord is then left free, the operator then pulls the cord until the window is a sufficient height, and then, by simply letting go the break cord, the sash-cord is tightened up.

16,510, Imitating Marbles, &c. B. and W. Oldfield.

According to this invention, the design is drawn upon paper and transferred upon a lithographic stone or by a printing-press. The surface of the material is varnished, so that it is made non-absorbent. The design, traced in ink which is soluble in spirits, is then placed over the material, and the imitation is more complete than the ordinary methods can effect.

17,223, Reflecting Gas-light, &c. J. Cobbe.

A more or less opaque shade or reflector is used by this inventor, instead of an inverted conical cone, the declination of which varies according to the distance between the normal level of the light and the height of the ceiling. The light is by these equally reflected in a downward direction and agreeably diffused throughout the room.

#### NEW APPLICATIONS FOR PATENTS.

Nov. 2.—15,806, R. Newell, Ventilating Rooms and Buildings.—15,850, J. Smith, Window-fasteners.—15,857, W. Kinear, Metallic Ceilings and Cornices.—15,861, B. and W. Kent, Cutting Bricks and Loading on to Barrows.

Nov. 3.—15,879, J. Clayton and C. Tindall, Water-closets.—15,920, J. Lightbody, Water-cisterns, &c.

Nov. 5.—15,948, B. Giraud and S. Fisher, Latch and Lock Arrangement for Doors.—15,997, A. Boulton, Paint.

Nov. 6.—16,004, P. Mugford, Removing or Replacing Tiles in Firegrate Jambs.—16,011, J. Shepherd, Treads for Stairs, Steps, Floors, &c.—16,019, H. Owens, Operating Fanlights, Skylights, &c.—16,035, S. Challenor, Lacquers and Varnishes.—16,045, W. Thomson, Door Knobs and Fixing same to Spindles.—16,053, C. Huelsner, Fireproof Device for Walls, Ceilings, &c.

Nov. 7.—16,087, R. Bluck, Bricks, Tiles, Pipes, &c.—16,113, P. Evans, Cement.—16,129, J. Lansard, Electrical Alarms for Doors and Windows.—16,131, A. McKeechie, Stone-dressing Tool.—16,145, J. and T. Conolly, Moulding-machines.

Nov. 8.—16,155, J. Thornton, Fireplaces.—16,169, F. Abbey and A. Walshaw, Chimney-pot.—16,182, J. Chandler, Sash-fastener.—16,185, A. Smith, Dressing White Lead, &c.—16,203, F. Hawkes, Sash-cords, &c.—16,209, M. Szabo, Kitchen Ranges.—16,214, J. Phelps, Eaves Gutters of Roofs.

Nov. 9.—16,215, J. Phelps, Eaves Gutters of Roofs.

Nov. 10.—16,216, J. Phelps, Eaves Gutters of Roofs.

Nov. 11.—16,217, J. Phelps, Eaves Gutters of Roofs.

Nov. 12.—16,218, J. Phelps, Eaves Gutters of Roofs.

Nov. 13.—16,219, J. Phelps, Eaves Gutters of Roofs.

Nov. 14.—16,220, J. Phelps, Eaves Gutters of Roofs.

Nov. 15.—16,221, J. Phelps, Eaves Gutters of Roofs.

Nov. 16.—16,222, J. Phelps, Eaves Gutters of Roofs.

Nov. 17.—16,223, J. Phelps, Eaves Gutters of Roofs.

Nov. 18.—16,224, J. Phelps, Eaves Gutters of Roofs.

Nov. 19.—16,225, J. Phelps, Eaves Gutters of Roofs.

Nov. 20.—16,226, J. Phelps, Eaves Gutters of Roofs.

Nov. 21.—16,227, J. Phelps, Eaves Gutters of Roofs.

Nov. 22.—16,228, J. Phelps, Eaves Gutters of Roofs.

Nov. 23.—16,229, J. Phelps, Eaves Gutters of Roofs.

Nov. 24.—16,230, J. Phelps, Eaves Gutters of Roofs.

Nov. 25.—16,231, J. Phelps, Eaves Gutters of Roofs.

Nov. 26.—16,232, J. Phelps, Eaves Gutters of Roofs.

Nov. 27.—16,233, J. Phelps, Eaves Gutters of Roofs.

Nov. 28.—16,234, J. Phelps, Eaves Gutters of Roofs.

Nov. 29.—16,235, J. Phelps, Eaves Gutters of Roofs.

Nov. 30.—16,236, J. Phelps, Eaves Gutters of Roofs.

Nov. 31.—16,237, J. Phelps, Eaves Gutters of Roofs.

Nov. 32.—16,238, J. Phelps, Eaves Gutters of Roofs.

Nov. 33.—16,239, J. Phelps, Eaves Gutters of Roofs.

Nov. 34.—16,240, J. Phelps, Eaves Gutters of Roofs.

Nov. 35.—16,241, J. Phelps, Eaves Gutters of Roofs.

Nov. 36.—16,242, J. Phelps, Eaves Gutters of Roofs.

Nov. 37.—16,243, J. Phelps, Eaves Gutters of Roofs.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

Nov. 6.

By DAVIES & CO.

Fulham—58 to 68 even, Edgemoor-road, 72 years, ground-rent £10, 12s. 6d. 4330

Lee, St. Peter's-square—“The Friary” 72 years, ground-rent £20 1,000

By G. H. MASTERMAN & CO.

Lambeth—64, 65, and 66, Janus-street, freehold 980

By RICK BOOS.

Bermondsey—37, Blue Anchor-lane, 45 years, ground-rent £3 200

Lower Norwood—15 and 17, Hamilton-road, freehold 580

By RISHWORTH & STEVENS.

Soho Rupert-street, “The Plough” public-house, freehold 4,800

40a, Rupert-street, freehold 2,020

By MARINA & BARNES.

Belling, Windsor-road—“Pelham Lodge,” 80 years, ground-rent 68 ss. 480

Chelsea 278 and 279, King's-road; and three studios, 20 years, ground-rent £21, 1s. 6d. 1,050

Spitalfields 26, Church-street, freehold 930

3 to 6, St. Andrew-street, freehold 650

Daiston—39 and 41, Albion-road, 66 years ground-rent £10 710

45, Albion-road, 58 years, no ground-rent 380

By W. B. HALLETT.

Hackney—27, Elmsdale-street, freehold 680

21 and 23, Elmsdale-street; and 1, 2, and 24, Middlesex-place, freehold 960

Camden Town—214 and 216, Arlington-road, 24 years, ground-rent £10 200

28 and 29, Wellington-street, 23 years, ground-rent £10, 10s. 540

Oakley-square—4 and 5, Crawley-mews, 54 years, ground-rent £4 230

Holloway—3, Middleton-road, 58 years, ground-rent £2 670

By DEKENHAM, TOWNSON, & CO.

Cavendish-square—77, Wigmore-street, freehold 3,000

Nov. 7.

By W. W. JENKINSON.

Antigua—The Sugar Estate at Montpelier, The Hope, Upper Wildrons, and Upper and Lower Harms, about 61 acres, with machinery and stock 2,500

By W. A. BLACKMORE.

Old Kent-road—16 to 24, Surrey Buildings, 79 years, ground-rent £17 545

By FAREBROTHER, ELLIS, & CO.

Cobham, Surrey, Littleheath-road—Two plots of land, 15a. 3r. 5p., freehold 2,010

Edgware-road—An improved ground-rent of £10, 10s. term 28 years 150

Teddington, Canby-road—The residence called “Eastfields,” freehold 500

By BLAKE, HADDOCK, & CARPENTER.

Croydon, Dingwall-road—“Springfield,” 79 years, ground-rent £17, 5s. 750

By BRADLEY & CO.

Worpleston—“The Firs,” and 3r. 1r. 17p., freehold 8,000

Two freehold cottages, and 1a. 2r. 9p. 450

By W. W. JENKINSON.

Bermondsey—110 and 111, Bernandsey-street, 61 years, ground-rent £10 325

By C. C. & T. MOORE.

Highbury—10, 12, and 22, Coneywood-street, freehold 1,155

By HOWELL, SON, & BOWEN.

South Kensington—11, Nevera-road, 84 years, ground-rent £10 705

Nov. 8.

By BRADLEY & CO.

#### MEETINGS.

MONDAY, NOVEMBER 19.

Royal Institute of British Architects.—Business Meeting, for Members only. (1) Mr. Lucy W. Ridge will call attention to the papers entitled (a) “Conservation of Ancient Monuments and Remains” and (b) “Hints to Workmen engaged on the Repair and Restoration of Ancient Buildings” to their mode of issue, and to their contents. (2) The Council will submit for the consideration of the Members a proposed form of Articles of Puppilage. 8 p.m.

TUESDAY, NOVEMBER 20.

Birmingham Architectural Association.—Mr. H. D. Appleton, on “The Affiliation of Architectural Student Societies.”

Manchester Architectural Association.—Mr. J. Corbett on “House Heating Water Fittings.” 7.30 p.m.

Statistical Society.—The President's Inaugural Address will be delivered by Dr. T. Graham Balfour, F.R.S. 8 p.m.

Institution of Civil Engineers.—Discussion on Mr. W. Beaumont's paper on “Friction-Brake Dynamometers.” 8 p.m.

WEDNESDAY, NOVEMBER 21.

Society of Arts.—The Opening Address of the Session will be delivered by the Duke of Abercorn, C.B., Chairman of the Council. 8 p.m.

British Archaeological Association.—(1) Mr. H. Syer Culling, F.S.A. (Secr.) on “The Relics and Monuments of William and Mary.” (2) Mr. J. Stevens on “An Early Builders' Foremen and Clerks of Works' Institution.” 8.30 p.m.

Inventors' Institute.—A paper will be read on “Minton's Pottery and Ceramic Wares.”

Royal Meteorological Society.—Papers by Mr. G. J. Symonds, F.R.S., and Mr. R. H. Scott, M.A., F.R.S. 7 p.m.

THURSDAY, NOVEMBER 22.

Arts and Crafts Exhibition Society.—Mr. T. J. Cobden-Saunders on “Bookbinding.” 8.30 p.m.

Society of Telegraph Engineers and Electricians.—Mr. H. Edmunds on “A System of Electrical Distribution.” 8 p.m.

Society of Antiquaries.—8.30 p.m.

London Institution.—Professor W. E. Ayrton, F.R.S., on “Electrical Transmission of Power.” 6 p.m.

London and Middlesex Archaeological Society. (1) Mr. J. Watson, F.S.A. on “The History of the Chapel of St. Thomas, of Acon.” (2) Mr. E. W. Brabner, F.S.A., on “The History of the Mercers' Company and its eminent Members.” 8 p.m. (Mercers' Hall.)

#### Miscellaneous.

**The London County Council.**—Mr. Mark H. Judge is a candidate for one of the two seats which are allotted to the Division of North Paddington. He points out that it was as the representative of the ratepayers on the Paddington Vestry that, in January, 1885, he first called attention to the now notorious proceedings of the Metropolitan Board of Works in connexion with the new London Pavilion Music-hall, which ultimately led to the appointment of the Royal Commission. Subsequent to the appointment of the Royal Commission his colleagues elected him as one of the representatives of Paddington on the Board of Works, and this chiefly for the purpose of enabling him to assist the inquiry. The interim report of the Royal Commission, he remarks, vindicates every step that he took in demanding an inquiry into the proceedings of the Board, and fully justifies the action of the Metropolitan Board of Works Inquiry Committee, over which he presided.

**Vienna.**—The arrangements for heating and lighting the new Burg Theatre are probably the most complete, as they are certainly the most extensive at present in Europe. The heating is obtained by means of eight boilers, with a pressure of ten atmospheres. The lighting is effected by four engines and eight dynamos, which charge 540 accumulators, each weighing 600 lb. These latter are arranged in three groups, namely, one for the stage, another for the auditorium, and the third for the foyers, passages, vestibules, staircases, &c., with a collective energy of 64,000 candle-power. The auditorium has 1,090 lights, of which 370 are grouped together in the chandelier; the stage has 1,970, the store and dressing-rooms 800, and the rest of the house 1,800, besides fifteen arc lamps for the outside and for special occasions. Double lengths of wire are laid everywhere, as a reserve in case of failure, &c., making a total length of 683½ English miles!

**The English Iron Trade.**—The English iron market is quieter for crude material, fairly active for finished iron, and brisk for steel. On the whole, there is a steady tendency. Although the demand for pig-iron is quieting down, as the slacker season is approaching, and shipments are falling off, prices generally are fairly well maintained. There has been a decline in the Glasgow warrant market, which has been flat; but Scotch makers' quotations show little change. Middlebrough pig is somewhat weaker, 34s. 8d. being about the figure for No. 3 G.M.E. In Lancashire, makers are firmer than in the north. Hematites in the north-west are very stiff at the makers' quotation, notwithstanding that the market is not in such a satisfactory position as lately, makers quoting 46s. 6d., or 2s. a ton more than last week. A very fair trade is still done in manufactured iron, and prices are well maintained. Some of the Staffordshire makers having raised their products by 5s. a ton, the Lancashire market is hardening. In the North of England and Scotland, prices are firm. Welsh bars have been raised 2s. 6d. a ton, the minimum price being £5 f.o.b. The business in tin-plates is fairly active, and makers' quotations are unchanged. There is still marked activity in the steel trade, nearly all departments being well employed. Shipbuilders continuing very busy, there is a large call for steel and iron ship-building material. Activity is well maintained amongst shipbuilders.—*Iron.*

**Harburg.**—A new town-hall is to be erected at Harburg, a small town opposite Hamburg, at a cost of some 15,000*l.* The design was obtained from Mr. C. Hehl, of Hanover, in competition among the architects of Berlin and Hanover. We mention this little fact only in order to draw attention to the composition of the jury; it consisted, not, “comme chez nous,” of town councillors without professional assistance, but of one councillor, three architects, and one builder. This is as it should be.

**Map of the County of London.**—We have received from Mr. Stanford a map showing the County of London according to the Local Government Act. The map embraces the whole of the Metropolitan area which will, on the 1st of April, 1889, become the County of London, showing the boundaries of the Electoral Divisions and the Urban Sanitary Districts.



**The London Tramways Company: Further Extensions.**—The London Tramways Company have given notice of their intention to apply to Parliament during the next session for powers further to extend their lines in the neighbourhoods of Streatham and Tooting. Last session the company obtained powers for the construction of a line from their terminus at Clapham-common, and through Balham to Trinity-road, Upper Tooting; and they are now applying for powers still further to extend the line in the direction of Lower Tooting. Before proceeding with the extensions which have already received Parliamentary sanction, the widening of a portion of Balham-road is necessary, and the Wandsworth District Board of Works are now taking steps for the requirement of the property necessary for the widening of the road, the Tramway Company having undertaken to bear the expense. As soon as the widening of the road is completed, the construction of the line will be at once commenced, and it is expected to be ready for traffic to Upper Tooting early in the spring. The extension to Streatham for which the company are applying is practically a revival of their Bill of last session, under which they sought powers for extending their line from Water-lane, Brixton, to Brixton-rise and Streatham. The carriage-way throughout is exceptionally favourable for the laying-down of tramways, being on an average not less than 50 ft. wide. The Bill, although opposed, passed the Committee of the House of Commons; but on coming before the Lords' Committee, it was rejected on the opposition of a number of frontagers, although a petition in its favour bore the signatures of more than three-fourths of the inhabitants and householders of the District.

**The International Ironmongers' Iron and Metal Trades' Exhibition,** opened at the Agricultural Hall, Islington, on Monday last, is neither so large in extent nor so comprehensive in character as its long and high-sounding title would lead one to expect. It contains, no doubt, some useful and ingenious appliances conducive to the comfort and safety of the home, but there is not very much in it of special interest to architects and builders in their capacity of constructors. The space on the ground floor of the hall is only partially occupied; many well-known firms of the highest repute and enterprise are absent from the catalogue of exhibitors; and there are other indications that manufacturers and exhibitors have become satiated with these "trade exhibitions." Among things worth inspection by the visitors are the ingenious and compact Bostwick folding shutters and gates (Stand 112), Mr. Samuel Elliott's "Simplex" Metal Weather-bar (Stand 44), Messrs. Ewart & Sons' "Lighting Geyser" or bath water-heater (Stand 6), Messrs. J. H. Heathman & Co.'s appliances for fire-prevention and extinction (Stand 153), Messrs. C. Isler & Co.'s tube well-lifting apparatus (Stand 68), Messrs. J. Kaye & Son's push-and-pull locks (Stand 56), Mr. C. G. Roberts' improved rain-water separators (Stand 16), the St. Pancras Ironworks Company's table-fittings (Stand 55), Messrs. Willing & Co.'s enamelled copper letters (Stand 121), and Mr. J. Stannah's lifts and hoists, with special years. Mr. Stannah also shows his pendulum pump. Many of the appliances here named have been previously described in the *Builder*.

**Building Activity in Jerusalem.**—Jerusalem, writes a correspondent resident in that city to the *Allgemeine Zeitung*, is steadily increasing in size, building operations being actively carried on, in spite of the circumstance that most of the town is situated on barren rock, and has neither commerce nor industry to boast of. Everywhere and continually new buildings are springing up, whilst new parks, public institutions, and churches are improving formerly desolate spots. New large dwelling-houses are constantly being built by wealthy Jews, out the barrack-like, one-storied appearance of these structures is far from adding to the beauty of the city. The Rothschilds are building a new hospital on the Hill of God's Peace, and close by an Armenian Church is in course of erection. The Russians, too, are busy building—as, for instance, a consulate, a church, a hospital, and residences for their pilgrims. Close to this hospital, a handsome residence for German pilgrims has just been finished. On the Olive Mountain the Russians have also built a look-out tower, whence a splendid view is obtained of the neighbouring country. Some Greeks are further building cafés and bazars, and Armenians shops.

**The Mayor of West Ham.**—The newly-elected Mayor of the Borough (shortly to be the County) of West Ham, is Mr. Alderman Robert L. Curtis, J.P., the senior partner of the firm of R. L. Curtis & Sons, quantity surveyors. It will be in the recollection of many members of the building trade that the new Mayor was master of the Tylers' and Bricklayers' Company during the Jubilee year.

PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |           | L. s. d. |         | L. s. d. |  |
|----------------------------------------------|-----------|----------|---------|----------|--|
| Greenheart, B.G.                             | ton       | 6 10 0   | 7 10 0  |          |  |
| Teak, E.I.                                   | load      | 9 0 0    | 14 0 0  |          |  |
| Sequoia, U.S.                                | foot cube | 0 2 3    | 0 3 0   |          |  |
| Ash, Canada                                  | load      | 3 10 0   | 5 0 0   |          |  |
| Birch                                        | load      | 3 10 0   | 6 0 0   |          |  |
| Elm                                          | load      | 4 0 0    | 5 0 0   |          |  |
| Fir, Dantisc, &c.                            | load      | 2 0 0    | 4 0 0   |          |  |
| Oak                                          | load      | 2 0 0    | 4 0 0   |          |  |
| Canada                                       | load      | 5 10 0   | 7 0 0   |          |  |
| Pine, Canada red                             | load      | 3 5 0    | 4 0 0   |          |  |
| " yellow                                     | load      | 3 10 0   | 5 10 0  |          |  |
| Lath, Dantisc                                | fathom    | 4 10 0   | 6 10 0  |          |  |
| St. Petersburg                               | load      | 5 0 0    | 6 10 0  |          |  |
| Walnut, Riga, &c.                            | log       | 2 15 0   | 4 5 0   |          |  |
| " Odessa, crown                              | log       | 10 0 0   | 10 10 0 |          |  |
| Deals, Finland, 2nd and 1st std.             | 100       | 7 0 0    | 9 10 0  |          |  |
| " 4th and 3rd                                | 100       | 7 0 0    | 8 0 0   |          |  |
| St. Petersburg, 1st yellow                   | load      | 10 10 0  | 15 10 0 |          |  |
| " 2nd                                        | load      | 9 0 0    | 10 10 0 |          |  |
| " white                                      | load      | 8 0 0    | 10 10 0 |          |  |
| Swedish                                      | load      | 8 0 0    | 10 10 0 |          |  |
| White Sea                                    | load      | 9 0 0    | 17 10 0 |          |  |
| Canada, Pine, 1st                            | load      | 18 0 0   | 25 10 0 |          |  |
| " 2nd                                        | load      | 11 0 0   | 17 10 0 |          |  |
| " 3rd, &c.                                   | load      | 7 10 0   | 10 10 0 |          |  |
| " Spruce, 1st                                | load      | 9 0 0    | 10 10 0 |          |  |
| " 3rd and 2nd                                | load      | 7 0 0    | 8 10 0  |          |  |
| New Brunswick, &c.                           | load      | 6 15 0   | 15 10 0 |          |  |
| Battens, all kinds                           | load      | 6 10 0   | 12 0 0  |          |  |
| Flooring Boards, sq., 1 in., prepared, first | 100       | 0 11 0   | 0 14 6  |          |  |
| Second                                       | 100       | 0 8 8    | 0 10 9  |          |  |
| Other qualities                              | 100       | 0 5 6    | 0 7 9   |          |  |

| TIMBER (continued).        |      |        |        | L. s. d. |  |  |  |
|----------------------------|------|--------|--------|----------|--|--|--|
| Cedar, Cuba                | foot | 0 0 31 | 0 0 31 |          |  |  |  |
| Honduras, &c.              | foot | 0 0 31 | 0 0 31 |          |  |  |  |
| Australian                 | foot | 0 0 21 | 0 0 31 |          |  |  |  |
| Malayana, Cuba             | foot | 0 0 41 | 0 0 51 |          |  |  |  |
| St. Domingo, cargo average | foot | 0 0 41 | 0 0 51 |          |  |  |  |
| Mexican                    | foot | 0 0 41 | 0 0 41 |          |  |  |  |
| Tobasco                    | foot | 0 0 41 | 0 0 51 |          |  |  |  |
| Honduras                   | foot | 0 0 41 | 0 0 51 |          |  |  |  |
| Box, Turkey                | ton  | 5 0 0  | 12 0 0 |          |  |  |  |
| Walnut, Italian            | foot | 0 0 41 | 0 0 51 |          |  |  |  |

METAL.

|                            |     |          |         |  |  |
|----------------------------|-----|----------|---------|--|--|
| Iron—Bar, Welsh, in London | ton | 4 17 6   | 5 0 0   |  |  |
| " " at works in Wales      | ton | 4 7 6    | 4 10 0  |  |  |
| " Staffordshire, in London | ton | 5 15 0   | 7 0 0   |  |  |
| COPPER—                    |     |          |         |  |  |
| British, cake and ingot    | ton | 81 0 0   | 82 0 0  |  |  |
| Best selected              | ton | 82 0 0   | 83 0 0  |  |  |
| Sheets, strong             | ton | 85 0 0   | 88 0 0  |  |  |
| Chili, bars                | ton | 73 10 0  | 0 0 0   |  |  |
| YELLOW METAL               | lb. | 0 0 7½   | 0 0 7½  |  |  |
| LEAD—                      |     |          |         |  |  |
| Pig, Spanish               | ton | 13 10 0  | 0 0 0   |  |  |
| English, common brands     | ton | 13 15 0  | 0 0 0   |  |  |
| Sheet, English             | ton | 14 15 0  | 0 0 0   |  |  |
| SPELTER—                   |     |          |         |  |  |
| Silesian, special          | ton | 18 15 0  | 19 17 6 |  |  |
| Ordinary brands            | ton | 18 12 6  | 18 15 0 |  |  |
| TRY—                       |     |          |         |  |  |
| Strait                     | ton | 101 10 0 | 0 0 0   |  |  |
| Australian                 | ton | 101 10 0 | 0 0 0   |  |  |
| English Ingots             | ton | 104 10 0 | 0 0 0   |  |  |
| Zinc—English sheet         | ton | 22 10 0  | 23 10 0 |  |  |

OILS.

|                        |        |         |         |  |  |
|------------------------|--------|---------|---------|--|--|
| Linseed                | ton    | 19 2 6  | 19 7 6  |  |  |
| Cocanut, Cochin        | ton    | 28 10 0 | 28 0 0  |  |  |
| Ceylon                 | ton    | 32 15 0 | 33 0 0  |  |  |
| Palm, Lagos            | ton    | 27 0 0  | 27 10 0 |  |  |
| Rapeseed, English pale | ton    | 30 15 0 | 0 0 0   |  |  |
| " brown                | ton    | 29 0 0  | 28 5 0  |  |  |
| Compressed, refined    | ton    | 23 0 0  | 0 0 0   |  |  |
| Tallow and Oleins      | ton    | 19 0 0  | 45 0 0  |  |  |
| Lubricating, U.S.      | ton    | 5 0 0   | 6 0 0   |  |  |
| " refined              | ton    | 7 0 0   | 12 0 0  |  |  |
| TURPENTINE—            |        |         |         |  |  |
| American, in casks     | cwt.   | 1 15 3  | 0 0 0   |  |  |
| Tar—                   |        |         |         |  |  |
| Stockholm              | barrel | 1 1 6   | 0 0 0   |  |  |
| Archangel              | barrel | 0 11 0  | 0 11 6  |  |  |

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITION.

| Nature of Work. | By whom required. | Premium.   | Designs to be delivered. | Page. |
|-----------------|-------------------|------------|--------------------------|-------|
| Drainage Scheme | Elham R. S. A.    | 50 Guineas | Nov. 29th                | ii.   |

CONTRACTS.

| Nature of Work, or Materials.                  | By whom required.       | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|------------------------------------------------|-------------------------|-----------------------------------|--------------------------|-------|
| Broken Blue Guernsey Granite                   | Chiswick Local Board    | A. Ramsden                        | Nov. 21st                | xiii. |
| Roadmaking and Paving Works                    | Hammermith Vestry       | Official                          | Nov. 21st                | xiii. |
| Corrugated Iron Sheds                          | Mill End Vestry         | J. M. Knight                      | do.                      | xi.   |
| York Paving                                    | do.                     | do.                               | do.                      | xi.   |
| Taking up and Re-laying Carriageway            | Clarkson Vestry         | Official                          | Nov. 22nd                | xi.   |
| Making-up Road, &c.                            | Beckenham Local Bd.     | G. B. Carlton                     | Nov. 26th                | xi.   |
| Repairing, Painting, &c., Street Lamps.        | Fulham Vestry           | J. P. Norrington                  | Nov. 27th                | xi.   |
| Dust Cart                                      | Lewisham Bd. of Wks.    | Official                          | do.                      | xiii. |
| Guernsey Granite Sills                         | do.                     | do.                               | do.                      | xiii. |
| Making-up and Paving Road                      | St. Mary (Batt.) Vestry | J. T. Pilditch                    | do.                      | xi.   |
| Jobbing Works                                  | Greenwich Brd. of Wks.  | Official                          | Nov. 28th                | xi.   |
| Wood Pavement                                  | Pulham Vestry           | J. P. Norrington                  | do.                      | xiii. |
| Building Married Quarters, Aldershot           | War Department          | Official                          | do.                      | ii.   |
| Before Destructor, &c.                         | Hastings Corporation    | F. H. Palmer                      | Dec. 1st                 | xiii. |
| Water Mains, Hydrants, Sluices, &c.            | Mansfield U.R.S.A.      | G. Hodson                         | Dec. 5th                 | xiii. |
| Ordinary Works, Repairs, Liverpool             | Com. of H. M. Works     | Official                          | do.                      | ii.   |
| Pumping Engine and Boiler                      | West Ham Corporation    | do.                               | Dec. 11th                | xi.   |
| Embankment and Public Hall, nr. Slough Station | H. A. Cheera            | Official                          | Dec. 13th                | xi.   |
| Wood Paving                                    | Met. Board of Works     | Official                          | Dec. 14th                | xi.   |
| Footway, &c. under Thames, Blackwall           | do.                     | do.                               | Dec. 21st                | xi.   |
| Cheap Food Depot, Edgware-road, W.             | Salvation Army          | J. W. Dunford                     | Not stated               | xiii. |

PUBLIC APPOINTMENT.

| Nature of Appointment. | By whom Advertised.                | Salary.    | Applications to be in. | Page. |
|------------------------|------------------------------------|------------|------------------------|-------|
| Surveyor               | Worshipful Co. of Tallow Chandlers | Not stated | Dec. 5th               | xvi.  |

TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.]

**BRITTON.**—For building club-room and offices for the Cornwall-road Conservative Club, Britton, Mr. R. A. Lawcock, 88, Bishopsgate-street, and Mr. F. J. Grierson, joint architects:—  
Spencer & Co. £390 0 0  
Ivory 590 0 0  
Hollingsworth 530 0 0  
Stephenson 520 0 0  
Palmer 515 0 0  
Sawden 455 0 0  
Smart 445 0 0

**EDENBRIDGE (Kent).**—For additions and alterations to "Rushmore," Crockham Hill, near Edenbridge, for Mr. C. Ed. Melchior. Mr. Arthur Ardron, architect, 6, Poultry, R.G.  
J. D. Davidson (accepted) £475 10 0

**HORNSEY.**—For heating the Isolation Hospital, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—  
George Jennings, Stangate, Lambeth £230 0 0  
Accepted.

[Seventeen tenders received. No decision has yet been arrived at with regard to the tenders for heating the Board's Offices.]

**LONDON.**—For extension of a warehouse, at Brook's Wharf, High Timber-street, Upper Thames-street, E.C., for Mr. Robt. Warren. Mr. Fredk. Todd, architect:—

Higgs & Hill £4,740 0 0  
Mowlem 4,250 0 0  
Adcock 3,999 0 0  
Holland & Hannen 3,912 0 0  
Lougley 3,890 0 0  
Woodward 3,783 0 0  
Spencer 3,580 0 0  
Bywaters 3,483 0 0  
J. & J. Greenwood 3,444 0 0

**LONDON.**—For two houses and shops, High-street, Camden Town, London, for Mr. D. Cozier. Mr. R. G. Salter, 156, Osulton-street, N.W., architect. Quantities by Messrs. Brunson & Henderson, 3, Barbican, E.C.:—

Richardson Bros. £2,748 0 0  
Scrivener & Co. 2,678 0 0  
Ward & Lambie 2,675 0 0  
Wall Brothers 2,649 0 0  
Gould & Brand 2,463 0 0  
E. Ioms 2,439 0 0  
S. R. Lambie 2,387 0 0  
James Stodd (accepted) 2,329 0 0



**LONDON.**—For alterations and additions to the "Fulham Bridge Hotel," Brompton-road, Kensington, for Mr. E. Towersey. Mr. H. I. Newton, architect, 17, Queen Anne's-gate, Westminster, S.W. Quantities by the architect:—  
S. Gordon, Brompton-road, Kensington.....£2,850 0 0  
S. R. Lambie, Kensington-town.....2,837 0 0  
H. & E. Lea, Regent-street.....2,782 0 0  
Kirk & Randall, Woolwich.....2,674 0 0  
F. Mack, Edgeware-road.....2,546 0 0  
J. Walker, Poplar.....2,387 0 0  
Jack on & Todd, Hackney.....2,373 0 0  
Smith, Son, & Fletcher, Belgrave.....2,372 0 0  
Burman & Sons, Kennington Park.....2,355 0 0  
J. Beale, Westminster (accepted).....2,085 0 0

**LONDON.**—For decorative repairs to St. Stephen's Church, Canonbury, for the vicar and churchwardens. Mr. Arthur Ardron, architect, 6, Poultry, E.C.:—  
J. McCormick & Sons (accepted).....£204 0 0

**LONDON.**—For alterations, repairs, and additions to 11 and 2, "Green-gardens," W. Mr. W. Jacob Gibbon, architect, 36, Great James-street, Bedford-row, W.C.:—  
T. L. Green.....£449 0 0  
Messrs. Macfarlane.....942 0 0  
E. Z. Nunn.....909 0 0  
W. R. Head & Son.....893 0 0  
W. Gibbon & Son (accepted).....835 0 0

**LONDON.**—For alterations and repairs to the houses mentioned below. Mr. W. Jacob Gibbon, architect, 36, Great James-street, Bedford-row:—

No. 8, Kensington-gardens-square.  
T. L. Green.....£497 0 0  
Messrs. Macfarlane.....449 0 0  
E. Z. Nunn.....392 0 0  
W. R. Head & Son.....386 0 0  
W. Gibbon & Son (accepted).....374 10 0

No. 17, Devonshire-terrace.  
T. L. Green.....£235 0 0  
Messrs. Macfarlane.....187 0 0  
W. Gibbon & Son.....164 10 0  
W. R. Head & Son (accepted).....164 0 0  
E. Z. Nunn (withdrawn).....118 0 0

No. 74, Lancaster-gate.  
E. Z. Nunn.....£1,248 10 0  
W. Gibbon & Son.....949 10 0  
T. L. Green.....818 0 0  
Messrs. Macfarlane.....789 0 0

No. 2, Craven-terrace.  
T. L. Green.....£175 0 0  
W. R. Head & Son.....172 0 0  
W. Gibbon & Son.....169 10 0  
Messrs. Macfarlane.....165 0 0  
E. Z. Nunn (accepted).....134 0 0

**NORWICH.**—For erecting the City Chambers, Prince of Wales-road, Norwich. Mr. Edw. Preston Williams, architect. Quantities by Mr. F. W. Skipper:—  
Holmes & Bernard.....£2,740 0 0  
Wilkin & Wilkins.....2,556 0 0  
Downing & Sons.....2,550 0 0  
Wagg.....2,467 0 0  
Haves.....2,350 0 0  
Lacey.....2,275 0 0  
J. S. Smith.....2,275 0 0  
Youngs.....2,175 0 0  
Bennett (accepted).....2,048 0 0

**LONDON.**—For the erection of engineers' and smiths' shop at 47, Cross-street, E.C., for Mr. James Leo. Mr. John Ross, surveyor, 40, Ersmouth-street, W.C.:—  
Wall Bros (accepted).....£449 0 0  
Howard.....444 0 0  
Beasley.....383 0 0

**LONDON.**—For alterations, general repairs, and decorations at No. 8, Ulster-terrace, Regent's-park, for Mr. Sidney Davies. Mr. W. F. Powell, architect:—  
Eyreman.....£859 0 0  
Luing & Son.....587 0 0  
Fosley, George, King-street, Regent-street (accepted).....513 0 0

**LOUGHBOROUGH.**—For new Salvation Army Barracks for 80 persons at Loughborough, for the Salvation Army. Mr. G. G. Wallace, architect:  
Wells & Co., Lough.....£875 0 0  
A. Faulks, Loughborough.....830 0 0  
W. Corah, Loughborough.....794 0 0  
T. Barker, Loughborough.....789 0 0  
A. & S. Main, Loughborough.....755 0 0  
E. Jarvis, Banbury.....779 0 0  
G. Haywood & Son, Bedford.....708 0 0  
\* Accepted.

**MORTLAKE.**—For the erection of a hospital and mortuary, for the Rural Sanitary Authority, the Richmond Union. Mr. E. Maynard, architect, Richmond. Quantities by the architect:—

Hill.....£5,105 13 0  
Neil.....4,558 0 0  
Lansdown & Co.....4,596 0 0  
Perry & Co.....4,492 0 0  
Judd & Co.....4,372 0 0  
Knight.....4,357 0 0  
Nightingale.....4,273 0 0  
Higgs.....4,200 0 0  
Cox & Loder.....4,186 0 0  
Brass & Co.....4,182 0 0  
Hunt.....4,039 0 0  
Sale.....3,916 0 0  
Cox.....3,901 0 0  
Brickell.....3,950 0 0  
Hickinbotham.....3,920 0 0  
Bissett.....3,898 0 0  
Davis Bros.....3,808 0 0  
Scharren (accepted).....3,852 0 0  
Taylor.....3,594 0 0  
Bax.....3,474 0 0

**SOUTHWARK.**—For providing new glazed partition in the infants' department of the Alexis-street school, for providing additional lighting, and removing and refixing existing partition, for the School Board for London. Mr. T. J. Bailey, architect:—

G. Parker.....£148 0 0  
J. Bullers.....135 10 0  
Norris & Luke.....134 0 0  
H. L. Holloway.....125 0 0  
Davis Bros.....120 0 0  
H. H. Hollingsworth.....112 0 0  
G. B. Ash.....110 0 0  
G. Barker.....99 0 0  
\* Recommended by the Works Committee for acceptance.

**UCKFIELD.**—For alteration and restoration of the Parish Church, Uckfield, Sussex. Mr. Harry Benclitt, architect, Uckfield:—

Cheesman & Son, Uckfield.....£1,740 0 0  
Peckham Bros, Uckfield.....1,442 0 0  
W. V. Smith, Worthing.....1,428 0 0  
Hy. Card & Son, Lewes.....1,412 0 0  
P. Peters, Horsham.....1,285 0 0  
W. H. Canty, Tun. Wells (accepted).....1,177 10 0

**WINCHESTER.**—For new Salvation Army Barracks at Winchester, at per designs A and B (each to seat 800 people). Mr. G. G. Wallace, architect:—

Plan A.  
G. Marsh, Winchester.....£980 0 0  
A. Smith, Winchester.....954 14 0  
W. Shearman, Winchester.....930 0 0  
E. D. V. Buckingham, Winchester.....887 18 6  
Haywood & Son, Bedford.....763 0 0  
Edwin Jarvis, Banbury.....747 0 0

Plan B.  
W. Shearman, Winchester.....£1,250 0 0  
J. W. Jacobs, Winchester.....1,175 0 0  
G. Marsh, Winchester.....1,078 0 0  
E. D. V. Buckingham, Winchester.....964 0 0  
A. Smith, Winchester.....943 13 0  
Wesle & Co., Lough.....900 0 0  
Haywood & Son, Bedford.....745 0 0  
Edwin Jarvis, Banbury (accepted).....730 0 0

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# The Builder.

Vol. LV. No. 230,

SATURDAY, NOVEMBER 24, 1895.

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### "The Principles of Athenian Architecture."



THE new edition of Mr. Penrose's great work on Athenian architecture,\* perhaps the most notable illustrative work on architecture which this country has produced, though a re-issue, so far as the bulk of the volume is concerned, contains considerable and important additions, chiefly arising out of investigations made by the author and others since the publication of the first edition. It is also brought out in a wider-spaced and superior type to that of the first edition, rendering the volume more worthy, in form, of the important subject of which it treats. The majority of the plates are the old ones, but with some additions or corrections worked on them,—as in the general plan of the Acropolis, for instance, which has been altered so as to exhibit the results of more recent investigation, so far as Mr. Penrose accepts these; of which more anon. From the preface to the second edition, it appears that as long ago as 1883 the Society of Dilettanti (to whose liberality we are practically indebted for the existence of the work at all) determined to publish a new edition of the book; and it was mainly in furtherance of this intention that Mr. Penrose undertook to re-examine the buildings principally referred to, so that the discoveries of recent years might be incorporated in the book, especially in regard to the Erechtheion, which had been very slightly touched upon in the first edition; and he was desired to obtain permission, if possible, to make excavations for the purpose of obtaining the plan of the temple of Jupiter Olympius. His remarkable and speedy success in obtaining conclusive evidence in regard to this temple, and definitely settling the long-voiced question of its architectural ordinance, is known to our readers through our reports of his lecture on the subject at the Institute of Architects, in the "Transactions" of which a full report on the subject also appears. The account and

illustration of this investigation, with wood-cut illustrations, forms a large and important addition to Chapter XII. of the new edition. In the plates, a new one is added as ix.a, containing some details as to the naos of the Parthenon not before published. In plates 27, 29, and 30 (plan and two sections of the Propylæa), some new details resulting from recent examination of the ground are added. Plate 34, showing some further details of the Propylæa, and the skeleton plan of the ancient temple discovered by Dr. Dörpfeld immediately to the south of the Erechtheion (and which Mr. Penrose calls the "Cecropium"), takes the place of a former plate showing a restored plan of the ancient temple of Athene, destroyed by the Persians. Plate 40 is a new one, showing the plan of the Jupiter Olympius temple as excavated, and the indications for the restoration. Plates 41 to 45 are new, and give plans and sections of the remains of the Erechtheion; and Plate 46 corresponds to Plate 40 of the original edition. Of the new literary matter, besides the chapter on Jupiter Olympius already mentioned, Chapter I., "Description of the Acropolis," has an important second section on recent discoveries. To Chapter II., "The proportions of the Parthenon," is added a section on "more recent notes," referring to the Plate ix.a aforesaid. Chapter X., on the Propylæa, is very largely added to, with many wood-cuts. Chapter XIII. is an entirely new one on the Erechtheion. Chapter XIV., "On the remains of an earlier Parthenon," corresponds to Chapter XIII. of the original edition, but is nearly rewritten, and with a plan added showing the relative positions of the old and later "Hekatompeda." In the appendix Mr. Penrose prints nearly in full Mr. Watkiss Lloyd's in many respects remarkable paper on "The general theory of proportion in architectural design, and its exemplification in detail in the Parthenon," read at the Institute of Architects in 1859; an essay which Mr. Penrose apparently regards as the best exemplification of the idea as to regulated proportion, which was the basis of Greek architectural design, and the main conclusions in which appear entirely irrefutable. The rest of the matter forming the appendix stands much as before, with the addition of two short notes on "a recently-discovered frag-

ment of the temple of Jupiter Olympius," and on some fragments of an inscription relative to the construction of the Erechtheion.

It is so long since the original publication of the book, and we have observed that many of the younger generation of architects know so little of its importance in connexion with the study of Greek architecture, that before touching on the points dealt with in the new chapters, it may be worth while to briefly recapitulate the scope and object of a work the authority of which has long been acknowledged by old students of Greek architecture.

The title, "The Principles of Athenian Architecture," is not, we may observe, a quite accurate indication of the contents of the book. Mr. Penrose's treatise is really a very acute and painstaking investigation of facts in the practice of the Greek architects, from which we may no doubt infer some of their "principles," but only in a piecemeal manner, and by putting various facts together; nor does the author in reality attempt to give any comprehensive summary or theory as to the principles of Athenian architecture. We make no complaint of this; he gives us facts, for the most part indisputable, which are worth a great deal more than theories; but the title of the book is apt to convey a mistaken impression to those who are unacquainted with it, and to lead them to think that it is only one of the many essays on "principles" which may or may not be true, instead of a repository of most interesting and valuable facts. The main object with which Mr. Penrose commenced his researches originally was to ascertain, by minute and accurate measurements of the architectural monuments of Athens, the precise truth as to some very delicate curvatures and optical adjustments believed to have been employed by the Greeks, of which indications were given by Vitruvius; which had been in part guessed at by one or two modern observers; and the existence of which was first positively affirmed by the late Mr. John Pennethorne, who made himself certain by observation of the main fact, that lines commonly regarded as horizontal, in the Parthenon especially, and appearing so to the eye on casual inspection, were in reality curved, and curved with some distinct intention. What Mr. Pennethorne first perceived in a general way, Mr. Penrose set himself to investigate in detail, and his measurements and their record form a triumph of minute and accurate surveying work and draughtsmanship, even apart from the interest

\* "An Investigation of the Principles of Athenian Architecture, or the results of a survey, conducted chiefly with reference to the optical refinements exhibited in the construction of the ancient buildings at Athens." By Francis Crammer Penrose, Architect, M.A., F.R.A.S., &c. New and enlarged edition. Published by the Society of Dilettanti. Macmillan & Co., London and New York. 1888.

\* We cannot but wish that Mr. Penrose had recognised the desirability of a uniform system of rendering the Greek names of the buildings. He retains "Erechtheum," "Theseum," &c. Then why not "Parthenon?"



of the facts which they revealed. In addition, however, to this investigation as to the curves of adjustment, and the system of proportioning the parts in Greek architecture, the book comprises the most careful and accurate delineation of the principal remains of Athenian architecture as they exist, in plan, elevation, and section; not a book of "restorations" or of architectural pictures, but of solid and substantial information for the serious student of architecture, and such as will remain a permanent record and illustration of the most remarkable and refined collection of architectural monuments of which we have any knowledge.

Of the facts absolutely and incontrovertibly established by Mr. Penrose as to the method of the Greek architects, the first is that of the slight curvature of some of the main lines of their temples for purposes of optical effect. It is extraordinary that it should have been left to an investigator of almost the present generation to establish this fact, since Vitruvius, who has been read by many generations of architects, asserts the practice in words far more plain and precise than he generally uses, indicating that if the line of the stylobate were laid level, it would appear hollow to the eye—"Alveolatus oculo videbitur," indicating plainly both the practice and the immediate reason for it, though into the further philosophy of the ocular deception which rendered such a correction necessary he does not attempt to go. It seems extraordinary, especially considering the reverence with which Classic architecture, and Vitruvius as its prophet, were regarded throughout the Renaissance, that no one until modern days should have attempted to test so remarkable a statement by reference to actual remains. The Great Italian Renaissance architects, however, had little access in most cases to Greek work, and the coarser execution of Roman buildings might not have shown these corrections, even had they been actually attempted. In regard to Roman work, indeed, it may be doubted whether Vitruvius describes actual practice so much as what he considered ought to be aimed at. That the curvatures of the Parthenon should have escaped the observation of those who were not looking out for them Mr. Penrose considers natural enough: they are so slight as to be barely detected by the eye, except by "boning," and probably the steps till a comparatively recent period were encumbered with debris, and no one had taken the trouble to ascend to the cornice. The architects and agents employed by Lord Elgin had opportunities of seeing these things, no doubt; but, as Mr. Penrose sardonically observes, "they were otherwise occupied." What was established on the publication of Mr. Penrose's original volume was the existence of a slight upward curve of the entablature and of the stylobate at the ends of the Parthenon, and a lesser proportional upward curve on the flanks: the entablature in each case being less curved than the stylobate. For the detailed measurements, the student must refer to the work; we may merely remark here that the largest curve of the kind discovered,—that of the front stylobate of the Parthenon, is equivalent to a rise of .228 ft. in 100 ft. The existence of these curves is established beyond doubt: the eminent French architect, Le Sueur, persisted that they were due to settlement and opening of the joints; but micrometer measurements of the joints showed that such opening if there was, was the other way. The most careful attention was paid to this subsidiary evidence afforded by the condition of the joints, and by this attention Mr. Penrose was enabled to show that Mr. Pennington was mistaken in one of his observations, viz., in supposing that the front entablature of the Parthenon showed also a horizontal curve inwards from the two extremities. The joints here were found to be more or less open at the back, indicating that what curve there was had arisen from some displacement of the structure. It may be added that there is no conceivable theory as to optical illusion which could justify such a curve; a horizontal curve outwards would be more comprehensible.

It is not easy, however, on comparing the results of similar measurements on other Athenian buildings, to make out any definite and consistent system on which these curves were arranged, beyond this (which is a very intelligible principle), that the curvature of adjustment increases in ratio in proportion to the size of the structure; the small temple of Niké Apteros being without any such curvatures,—not even the entasis to the columns. But beyond this, it seems difficult to make out any general principle. The reason for upward curvature of the horizontal entablature beneath the pediment will be intelligible to any one who will draw out an obtuse-angled isosceles triangle, in straight lines, on a pretty large scale. The evidence of his sight will then show him the base-line appearing to "sag" by contrast with the raking sides of the triangle. The curvature of the stylobate will then follow obviously, as otherwise the stylobate line must appear hollow by comparison with the curved lines of the entablature. The curvature of the flank lines of both entablature and stylobate would then be necessitated, in order to harmonise with the lines of the front. But to carry out the theory completely it would seem that the raking cornice of the pediment should have a slight upward curvature, or it would appear hollow by contrast with the upward curve of the horizontal entablature. This, however, is not the case in the Parthenon. On the other hand, in the Propylæa the upward curve occurs in the entablature only, the steps being left level. Thus, although there can be no doubt that all these curves were the result of intention, and cannot be accounted for by settlement, as Le Sueur contended, it would seem that either the Greek builders themselves had no settled system, or that, whatever it was, we have not sufficient data for arriving at it.

The fact of the intentional entasis of the columns, first observed in the Parthenon by Cockerell, is questioned by no one now, though in the case of the Parthenon, Erechtheion, and Theseion, the curve is so slight that so careful an illustrator as Stuart represented the columns as absolutely straight-lined. The curve cannot, therefore, have been introduced from any preference for a curved line as a matter of beauty or expression in design, although it has been exaggerated into this in Roman and Renaissance examples. The theoretic reason for this entasis is more difficult to understand than the curvatures of the horizontal lines. Mr. Penrose gives some ingeniously-suggested reasons for it, for which we must refer the reader to his work. Our impression of the reason for it would be that the extent of the deviation of the outline of the column from the vertical line, caused by its upward diminution, would be exaggerated to the eye in the lower part of the column, by comparison with the line of the stylobate from which it starts; it would appear to recede more quickly there than in the middle portion of the column, where the eye sees it without reference to the juncture with the stylobate line, and accordingly it is made to recede more slowly from the vertical line in the lower portion. This view of the matter is at least in accordance with the evident object of many of the other corrections, such as the throwing outward of the line of the anta in evident relation to the falling away from it of the inner side of the tapering column, which, again, is leaned slightly inward towards the building with the same object. It would seem that the Greeks always had in view the fact that each main line of the structure acts and reacts upon the lines seen in connexion with it. Mr. Penrose's assertion that this entasis line of the column is a scientifically constructed hyperbola curve has been much criticised at various times as an over-refinement, and we have heard it strenuously called in question very recently by critics not without knowledge of the subject. One objection, of course, is that it is generally supposed that the conic section curves were not known to the Greeks at this period. No one, however, we venture to think, questions the accuracy and care of Mr. Penrose's measure-

ments, and his figures, giving the theoretic hyperbola curve in comparison with the measured curvature on the column, at four different heights, seem conclusive:—

| Height. | Offset of Hyperbola. | Offset to Column. |
|---------|----------------------|-------------------|
| 8.7*    | .1392                | .1397             |
| 15.75   | .2875                | .2886             |
| 23.0    | .4613                | .4618             |
| 31.43   | .684                 | .684              |

It seems quite impossible that such a correspondence as this should be accidental. This is from the Parthenon column; and Mr. Penrose states that the coincidence between the theoretic and actual curve is quite as close in the case of the Erechtheion column.

There is perhaps, however, more room for the scepticism which has been expressed in some quarters in regard to the curves of the echinus of the capital, and of some other mouldings. Mr. Penrose's first example is from the echinus of a well-preserved column in the peristyle of the Parthenon. He gives the upper portion (rather more than one-third of the whole curve) of the sectional line of the echinus as a hyperbola curve, the remainder as a portion of a circle of which the radius is 10 ft., the same radius as the portion of the hyperbola curve with which it "osculates." The curve produced is not so refined in effect as in some other cases. It seems difficult to believe that this rather illogical curve, if one may so speak, is the result of special design and mathematical setting out, especially as another example, from the pronaos, is shown as a pure hyperbola curve. Why vary the curve in this exceedingly minute manner in so small a detail? The facts certainly leave scope for the conclusion that the echinus may have been, after all, a purely architectural and not a mathematical design. Some other points seem to suggest that it is possible to exaggerate the belief in the extreme minuteness of care in every detail ascribed to the Athenian architects. For the slight and admitted variations in the width of abaci and metopes Mr. Penrose practically confesses his inability to find a recognisable motive. In one case (of a fallen capital) the abacus "is left .02 wider than at first intended." The author "has no hesitation in assigning this capital to the column fifth from the north-east angle, near which it lies, where the intercolumniation on either side being for some reason or other unusually great, it was thought desirable to reduce, although by so delicate an accommodation, the difference between these and the contiguous intercolumniations, which otherwise in the architrave might have seemed too palpable." The intercolumniations from the third to the seventh column from the angle are given thus—

8:170: 8:249: 8:224: 8:189.

the column referred to (the fifth) coming between the second and third measurements quoted. What possible reason could be assigned for setting these two columns this slight space wider, except inaccuracy in setting-out? No doubt the abacus may have been accommodated to prevent the error becoming obvious; but, with all reverence to the Greeks, this seems rather like what in these days we call "fudging" the details; certainly, to give it as a proof of extreme delicacy of perception seems rather over-refining.

In regard to the Greek system of proportioning the sizes of various portions of a building,—the front to the flank, the height of column to height of entablature, &c.,—the essay by Mr. Watkiss Lloyd, well known to students of the subject, and which, as we have observed, is introduced as an appendix to Mr. Penrose's book, is nearly as unanswerable in the coincidence between the theoretic and the measured proportions as are most of Mr. Penrose's own figures. His conclusion, as many of our readers know, is that the Greeks employed for the most part ratios of proportion, in the Parthenon at all events, which, commencing at 1:6, "advance towards equality by ratios preserving the common difference between their terms of

\* Measurements given in feet and decimals of feet. [P]



5"; e.g., 1:6, 2:7, 3:8, 4:9, and so on; the favourite ratios in the Parthenon being 4:9, 7:12, and 9:14. In the temple at Bassæ the ratios 1:3 and 2:5 are prominent, but are unknown in the Parthenon. Mr. Lloyd, indeed, shows sometimes that desire to find his theory everywhere which besets the theorist in general, as when he invites us to consider the employment of the ratio 2:3, as in accordance with his theory, since it may be expressed as 10:15. This will hardly do; but his comparisons between calculated and measured proportions are pretty conclusive. For instance, the ratio of the length of upper step of the Parthenon front to the full height of the front is taken by him as being, and intended to be, as 14:9. The length of the step is 101.341; the calculated height on this ratio should be 65.1478; the measured height is 65.185; and other measurements come equally near to the theoretic proportions. This, again, seems pretty conclusive that we are on the right track. The criticism of many modern architects may be, no doubt, summed up as "*cui bono?*" And might we not have an equally satisfactory building as much, at least, as six inches out of the scale? The answer would be that it might be equally satisfactory to us, but not to the Greeks. It seems hardly to admit of question that the Greeks had a sense of harmony about architectural proportion somewhat analogous to ours about musical proportion (though not reducible, probably, to an actual and unimpeachable physical basis like that of tonal proportions), and that our eyes do not see such things as their eyes saw them. Whether it is possible by training of the geometric sense to arrive at their position, and see things with their eyes, is a question; it may equally be a question whether it would be worth the effort. But it has to be recognised that to rightly understand the aim of the Greeks in architectural design we must bear in mind the important distinction between their view of architecture and ours. Mr. Penrose's work is the most valuable contribution by far that has been made towards enabling us to see Greek architecture from a Greek point of view: valuable especially in that it is, in spite of what we venture to think some little exaggeration here and there, for the most part so essentially practical in character; it gives us an array of facts laboriously mastered, the most remarkable corpus of information in regard to the evidence of the buildings themselves that have ever been got together; and, except in some minor details, the theories are deduced from the facts, and not built up apart from them as a mental recreation, as is palpably the case with much of Pennethorne's brilliant but fanciful folio on "The Geometry and Optics of Ancient Architecture."

We have left ourselves little space to touch on the portions of the book in which new matter is introduced, to some of which, however, we may return at a future time. The first of these additions is the new Section II. to Chapter I., on "More recent discoveries on the Acropolis." In these remarks, and the alterations to the plan of the Acropolis, Mr. Penrose is at variance with the German explorers in some points, and shows his characteristic caution and reserve in deductions. In the *Builder* for February 25 of this year we gave a small plan and description of the recent discoveries, as represented on Dr. Dörpfeld's theory.\* The most important feature in the new discoveries is that of the platform, with remains of a temple, immediately south of the Erechtheion, —so close on the Erechtheion site, indeed, that the foundation of the north colonnade of the temple runs in a slightly oblique line under the south porch of the Erechtheion. Dr. Dörpfeld regards this as the ancient temple of Athene, references to which have been taken by many previous modern writers to signify the old Erechtheion. Mr. Penrose regards this building as the Cecropion, about the position of which there

have been many questionings, Leake and other writers earlier in the century having regarded the Cecropion as being part of the Erechtheion: a position probably no longer tenable. Mr. Penrose makes no attempt to restore the interior plan of this temple; on his general plan of the Acropolis he merely gives the outline of the platform, but on a separate plate he gives a restoration of the plan of the peristyle. He restores it as an octastyle temple with sixteen columns on the flank. Dr. Dörpfeld, to whom is due the discovery of these remains, restores the temple with six columns in front and twelve on the flank. The English and German restorers have, however, worked from different data. Mr. Penrose accepts a fragment of a large Ionic capital, found near, as part of this building, and therefore restores it in such proportions as this fragment would indicate. He adopts the view of Leake, that the Ionic order was in the earlier period the national order in Attica,—a view, as he says, confirmed by the style of the Erechtheion, which immediately succeeded the building in question. Dr. Dörpfeld adopts the portions of Doric columns built into the north wall of the Acropolis enclosure as remains of this temple, and, of course, comes to a different result. Mr. Penrose attributes these Doric remains to the earlier Parthenon—an opinion which Leake had expressed before him. Our impression so far is that Dr. Dörpfeld is right topographically, and Mr. Penrose architecturally; that the temple was the ancient temple of Athene, but that Mr. Penrose's view as to the architectural restoration (as far as it goes) is the more probable. Mr. Penrose, in fact, coincides in thinking this "the ancient Temple of Minerva" (why Minerva?); but holds that it is also the Cecropion, or place of burial of Cecrops. The objection to this is that the Erechtheion inscription quoted by Mr. Penrose (p. 6) appears to us to refer to the Cecropion as in existence simultaneously, which this temple could not have been, as the Erechtheion goes over its site. He recognises this difficulty, as he adds: "Probably no temple bearing the name of Cecropion was standing at the time the inscription was written, but the name would have been preserved, and with, most likely, an altar erected on the old site." This seems a rather far-fetched explanation. In general, however, we cannot but admire Mr. Penrose's reasonableness and avoidance of dogmatism in regard to his views; an example which other explorers might well follow. With the archaeologists of the German school, it is too much the custom to announce each new theory as a discovered fact—a reproach which, in the case of Dr. Dörpfeld, is perhaps rather to be made against his friends than against himself; but, with all his brilliant powers of investigation and suggestion, he is somewhat too imaginative in temperament to be an altogether safe guide.\*

The important additions to the chapter on the Propylæa refer partly to the result of Boulé's investigations about thirty-five years ago, and to other clearances in different parts of the site since, and a plan is given of the ground adjoining the entrance to the Propylæa as now existing. This important chapter, and the full illustrations of the Erechtheion, may well form the subject of some separate consideration on another occasion. One curious point touched on is the probability that the western wall, between the Caryatide porch and the large Ionic portico, had been taken down and rebuilt when the temple was converted into a church. This portion,

with engaged half-columns outside and narrow pilasters within, was blown down in a storm in 1852. Dr. Dörpfeld called the author's attention to the fallen fragments of this work, and they both came to the conclusion, from the coarse style and execution of the mouldings, that the work was of another date from the true Erechtheion work, and had probably been filled in somewhere about the fourth century A.D., "before the Classical tradition had given way to Byzantine feeling." We regard this discovery (for if Dr. Dörpfeld and Mr. Penrose both coincide, we think it may reasonably be called a "discovery") with considerable interest, because we have always felt a dissatisfaction with all the restorations of that portion of the building, as meagre in appearance and not worthy of the rest of the structure. It would seem probable that the architectural world has been deceived for some time back as to this portion of the Erechtheion, and that it is not pure Greek work at all. Speaking of the building generally, Mr. Penrose remarks upon the minute symmetry which distinguishes each separate portion. Notwithstanding the unsymmetrical way in which the whole is composed, "not only are the intercolumniations spaced with the greatest exactness, but the joints of the stones forming the drums run exactly level;" and he adds in a foot-note, "this exactness of the joints shows that the marble was not concealed in any degree by painting." Not quite; it shows that there was nothing done that required the concealment of a decorative covering; but the Greeks might have made conscience of working the joints precisely uniform, even if they had intended to colour the work: we agree with the conclusion, but not with the argument. We may observe, however, that nothing can be more reasonable and truly architectural in spirit than Mr. Penrose's views on the probable method of applying colour in Greek architecture, and his restorations of some of the polychromatic decoration from traces found; a portion of the work which may be specially commended to the study of those who are not as yet acquainted with it.

In concluding for the present, we cannot help expressing a hope that it may be found practicable, in due time, to issue a cheaper edition of this representative modern work on Greek architecture, with a smaller page, and reduced illustrations, so as to bring the book, in all essentials, within the reach of a larger public.

## NOTES.

THE discussion which took place at the meeting of the Institute on Monday became a little tedious towards the end, and, as no definite resolution was passed, or even proposed, it is probable it may be condemned, in the minds of some people, as a waste of time, and its promoter may be looked upon by them as a captious and hypercritical person who finds pleasure in mere hair-splitting. But it is probable, as a matter of fact, that Mr. Ridge this time attained the only object he had in view, and that, in future, manifestoes on important questions, published in the name of the Institute, will be first submitted to a general meeting for approval, if not for discussion. Mr. Ridge's attack was mainly directed against the action of the Council in issuing, without consulting the general body of members, the two papers of advice that have lately appeared on the subject of the restoration of ancient buildings. He argued that such a proceeding was not only unconstitutional, but in the highest degree impolitic, inasmuch as the advice thus tendered lacked the weight which the assent of the general body of members would have given it, and, inasmuch as it was open to any member, under the circumstances, to repudiate the advice altogether. It very quickly became clear that the Council was conscious of having made an error, and the Chairman on its behalf did the only thing that was right under the circumstances by offering to consent to the papers being referred back to a committee for further revision. It certainly does seem

\* We may add, however, that Dr. Dörpfeld's detailed restorations and criticisms are at least worth more attention than they seem to receive from English architects, if we may judge from the fact that no publication giving full information about them is to be found in the Library of the Institute of Architects. Mr. Penrose refers his readers to Dr. Dörpfeld's own writings and restorations in the *Mittheilungen* and the *Antike Denkmäler*, but no copy of any of the numbers of those publications is to be found in the Institute Library; a fact which seems to us to argue a culpable neglect or ignorance of what is going on in archaeological research beyond this country, on the part of those whose duty it is to see that members of the Institute should be able to find in its library all the important publications of the day upon architecture. If not, what is the library for?

\* We should have made more clear at the time, which we observe we omitted to do, that this was a representation of the work mainly from Dr. Dörpfeld's point of view.



a little strange that, as the honorary secretary confessed, it did not occur to any member of the Council that a general meeting should be consulted on such a question. One of the chief uses of such a body as the Institute is to form, by discussion, a professional opinion on such subjects, which shall have the weight attached to opinions that command the assent of the great mass of professional men, and if it had been found, as we have no doubt would have been the case, that much of the advice in question did not, unluckily, command general assent, then it would have been better to put before the public an expurgated edition of it, containing only such propositions as the majority of members approved, and which the minority would, therefore, have loyally assented to. One of the main facts relied on by the speakers for the Council and the Art Committee, as excusing their action, was that the papers were only a re-issue of a document originally printed and circulated in 1865 by the Council without consultation with the general body. This document was drawn up by a very representative committee, on which sat, among others, Mr. Beresford Hope (the then president), Sir Gilbert Scott, Raphael Brandon, Street, and Burges. In those days, we all know, the Council was practically the Institute, and, if it had not been so, the opinions of such men would at the time have sufficed to silence criticism. In any case, two blacks do not make a white, and the speakers who made the excuse, with the exception of Mr. Nevill, showed that they knew very well it was only an excuse. Mr. Nevill seemed only half conscious that professional opinion on the subject of restoration had made immense strides since 1865, and that the authority of Sir Gilbert Scott and the great restorers of his day is by no means accepted now without question. Mr. Ridge, in his remarks, showed himself to be far more in touch with the more enlightened ideas of to-day, and went so far as to make the suggestion that architects should cease altogether to speak of "restoration," and should frankly recognise that what they were called upon to do was to repair, add to, or rebuild, as the case might be. We think the suggestion singularly felicitous. The word "restoration" has been made the cover for so much vandalism and so many absurdities that it has very generally fallen into disrepute, and the very best thing that could happen to it is that it should disappear.

NOTICES have been given of the intention to promote a Bill in the next session of Parliament for the making of a railway through the western Highlands. The proposed route embraces some of the grandest of Scottish scenery. The line is to commence at Helensburgh, the present terminus of the North British Railway, twenty-three miles north-west of Glasgow. It will pass up the eastern shores of the Gare Loch and of Loch Long to the village of Tarbet on the west coast of Loch Lomond. Thence it will run along the western shore of the lake, by Ben Vorlich, pass through Glen Falloch, and cross the Oban Railway at Crianlarich. From the southern part of Glen Dochart it will turn to the north-west, through Tyndrum, and over Glen Orchy to Inveroran and Loch Tulla. It will then cross Rannoch Muir, and, passing to the south of Loch Eriach, run through the Valley of the Spean to the foot of Ben Nevis, its terminus being at Fort William. There will be two branch lines, one to Loch Lochy, on the Caledonian Canal; the other by Loch Eil to Arisaig, on the west coast. The length of the line will be about one hundred miles. Those who have travelled leisurely through these scenes of surpassing loveliness, will, perhaps, regret that they should be desecrated by the modern innovation which Mr. Ruskin so heartily abominates. But we live in a utilitarian age, and the fact that the construction of the proposed railway would develop the fishing industries of the Highlands should reconcile us to the inevitable.

AT a recent meeting of the Manchester Geological Society, the President, Mr. John Knowles, gave an interesting statistical

account of the coal trade of Great Britain, extending over various terms of years. From it we select the following facts:—In 1859, 65,000,000 tons of coal were raised,—the latest returns give an output of 157,000,000 tons. The lowest rate of wages recorded in the Manchester district was in 1850, when the colliers received 4s. 3d. for getting a load of coal equal to 3 tons 10 cwt. During the Franco-German war 12s. was paid for the same amount of work. At the present period 7s. 10d. is the amount paid. In 1852, the average weekly earnings of boys and men in the same district was 16s. 3d. per week; in 1887 the returns gave 21s. 9d. per week. The total number of fatal accidents in collieries throughout the kingdom in 1857 was 1,119, when 65,376,706 tons of coal were raised, making one fatal accident per 58,422 tons raised. In 1887 there were 995 fatal accidents and 162,119,812 tons raised, or one fatal accident per 162,924 tons raised,—a most decided improvement. The best time for the coal trade,—namely, the period of the Franco-German war—was also the worst in another respect, because a large number of capitalists sank their thousands of pounds in the trade, raising rents and royalties all round. Let us hope that the present revival in the coal trade will not witness a repetition of the same folly.

WE have received a circular from the Franklin Institute of the State of Pennsylvania, U.S.A., asking us to assist in making it known that the Committee of the Institute is empowered to award certain medals for meritorious discoveries and inventions tending to the progress of the arts and manufactures. These are the Elliott Cresson Gold Medal, which was founded by the legacy of Elliott Cresson, of Philadelphia, and conveyed to trustees of the Franklin Institute, and is awarded "either for some discovery in the arts and sciences, or for the invention or improvement of some useful machine, or for some new process, or combination of materials in manufactures, or for ingenuity, skill, or perfection in workmanship"; and the John Scott Legacy Premium and Medal, founded in 1816 by John Scott, a merchant of Edinburgh, who bequeathed to the City of Philadelphia a considerable sum of money, the interest of which should be devoted to rewarding men and women who make useful inventions. The premium is not to exceed twenty dollars, and the medal is to be of copper, and inscribed, "To the most deserving." The "Journal" of the Franklin Institute, which is issued periodically, is in itself sufficient indication of the advanced standard of scientific study maintained by the Institute, and of the value which should attach to its medals as indications of merit. Further particulars can be obtained from the Secretary of the Franklin Institute, Philadelphia.

THE Statistics Office at Berlin publishes the following curious data:—Of the machines now being driven by steam-power, four-fifths have been erected within the last twenty-five years. France possesses 49,590 stationary engines, 7,000 locomotives, and 1,850 ships' boilers. In Germany there are 59,000 fixed boilers, 10,000 in locomotives and 1,700 in ships; whilst Austria has but 12,000 fixed and 2,800 locomotive boilers. Neither England nor the United States are mentioned in the above list, which they probably far outstrip. The aggregate working steam-power in the principal steam-employed countries amounts in the United States to 7½ millions h.p.; in England, 7; Germany, 4½; France, 3; and Austria, 1½ million. The locomotives of these countries number 105,000, representing another three millions of h.p., and the grand total for the whole world is 46 million h.p. As one h.p. equals the work of three horses, and as one horse equals seven men, it follows that the work done by steam throughout the world amounts to close upon a thousand million workmen, or treble the actual working population of the world. After making due allowance for "contingencies," it may, therefore, be said that steam has not only trebled human working power, but has

enabled man to husband his physical strength, and thus to develop more effectually the intellectual faculties.

WE extract the following from the able and interesting Presidential Address of Mr. John Honeyman, as President of the Glasgow Archaeological Society:—"It is matter of congratulation that our army of intelligent observers is yearly increasing, but there is all the more reason that we should be careful that their energies be not wasted, and hence one of the most pressing questions which can engage the attention of the archaeologists of the present day is: How are the many independent workers to be brought into the mutual relationship most suitable for the accumulation of facts, and that profitable commerce which enriches both him who gives and him who takes? One thing is certain, that at no previous period have the same facilities existed for dealing with this question. In these days of cheap and rapid travelling, cheap postage, and especially of cheap yet absolutely reliable methods of producing and multiplying illustrations, we are in a position to take an entirely new departure in the matter of co-operation, by greatly extending the limits hitherto practicable, so as to embrace England and Ireland as well as Scotland, and even 'poor little Wales.' My own idea is that we want a British Association for this express purpose,—an Association of all the archaeological societies in the country,—so as to organise the archaeological work of the country as to turn it to the best possible account. The task ought properly to be undertaken by the Society of Antiquaries; but it is needless to expect that,—the more the pity. Failing the Society of Antiquaries, the British Archaeological Association might perhaps take it up as their exclusive function, apart from their annual congress, which would go very well along with it. The name of the association is the most appropriate which could be suggested, and the work to be done is great enough and difficult enough to satisfy the aspirations of the most indefatigable and ambitious executive, for it must embrace not merely the catching and bringing to a focus the scattered rays of archaeological light, but necessarily, also, the rescuing from destruction or obscurity of the precious relics of the past,—the very instruments of our craft,—and the formation of a national museum of archaeology worthy of the name."

THE effects upon the Glasgow Exhibition building of the storm which prevailed over Scotland generally on Friday, the 16th, and raged with extraordinary violence along the valley of the Clyde, furnished a significant and, perhaps, not inopportune commentary on a proposal recently made to retain a portion of the building as a permanent public institution. Although the removal of exhibits and certain displeasing operations had been diligently in progress since the final closing, the building itself, when the storm of last week burst forth, stood intact, in pretty much all the structural stability it ever possessed. A large force of workmen and others were engaged in the removal work still remaining to be overtaken, without noticing greatly the howling of the tempest, and certainly without dreading damage to the huge structure that covered them, when suddenly the apex or ridge of the roof of the Grand Hall was, along the whole of its length, wrenched away from its fastenings and hurled down upon the roof of the courts devoted to the women's industries, situated to the north of the Grand Hall, and of considerably lower elevation. At the same time the fury of the wind made its mark upon the central dome, in the immediate neighbourhood of which, namely, on the main transept leading thence to the southern entrance (a part of the building it had been in contemplation to retain) a hole of large size was pierced, whereby the stalls beneath were at once exposed to the downpour of rain and hail then going on. Minor damage was inflicted at other points, and the authorities lost no time in clearing the Exhibition of all operators and shutting it up to await a cessation of the



storm. Some ladies at work in the Women's Industries section had a narrow escape, and, as it was, one person there engaged sustained severe wounds over the face and neck from falling metal and glass. Miscellaneous casualties in Glasgow and neighbourhood were numberless.

WE read that a scheme has been set on foot for constructing some deep-water docks at Mostyn, on the river Dee. Having inspected a site by Mostyn Quay, Mr. H. Whalley, of Chester, surveyor, makes a favourable report, and advises that the existing boundary walls can be utilised, at a considerable saving of expense. The coal-fields here are among the most extensive in Flintshire. The London and North-Western Railway main line between Chester and Holyhead passes close by the spot, and, it is said, the company have agreed to advantageous terms for the projected traffic. Concurrently with this venture we learn that a private Bill will be promoted in Parliament next session to amalgamate under one sole direction the various Welsh railways, which, upon the completion in the course of, as is hoped, eight months hence, of the bridge across the Dee, will be placed in through communication with the lines that run through Lancashire and Yorkshire.

THE Earl of Shrewsbury and Talbot—a name once so dreaded in France—strikes out a leading idea in his project for a "Compagnie Générale des Hansons Cabs à Paris." An attempt in that direction was made some thirty-three years ago, but whilst Paris (with one or two continental cities) can boast of her *coupés*, the various companies still rely upon *fiacres* for their common plant. The new Parisian hansoms will be of the "S.T." (surmounted by a coronet) pattern now plying in London, as built by Messrs. Forster Bros. & Co., fitted with steel and rubber tyres, and will be drawn by English horses. At first the experiment is to be made with 300 vehicles only, a number that will probably be increased on the opening of the Exhibition next year. We may expect soon to see a "cocher de grouillat-Talbot" figuring on the boards of the Palais Royal. If the enterprise proves to be a success the company intend to carry their operations into the larger provincial towns of the Republic.

THE collection of drawings by Cotman at the Burlington Fine Arts Club is of great interest, and contains some very fine examples of his peculiar genius; but it is not as complete as we had hoped to find it, and the collection made at one of the art exhibitions, held "in the seventies," in the galleries since devoted to the "Fisheries" and the line of succeeding exhibitions, included, if we remember right, some exceptionally fine works which are missing here, especially sea-pieces. It is unfortunate that the Burlington collection has not more of this class of work, for it was in his sea views of the Norfolk coast, with its low land-line and great expanse of sky, that Cotman's special powers, perhaps, showed to best advantage. His remarkable power of giving the effect of a wind-swept sky had full scope here, and in painting the sea he was always at home. The best of his sea-"bits" rather than sea-pieces (they are all small examples) in the Burlington Club, is No. 37, "Boats off Yarmouth," in which the swing and movement of the waves in the foreground is splendidly given; nearly as good is 41, "On the Dutch Coast." A wonderfully rich and glowing work, "The Hay-barge," which was in the Kensington collection, we do not find here; there is a small drawing of a similar subject (58). The finest thing in the room is, perhaps, the one which has been rightly hung in the centre at the top, the "Mont St. Michel" (77); there are two or three of the same subject; the grand feature of this one is the immense mass of white cloud which forms a background to the mount and the castle; the whole thing is in the spirit of Turner at his best. Many of Cotman's architectural drawings are of great

interest, and show, as Mr. Wedmore says in the preface, a great knowledge of architecture, but his architecture (especially in interiors) is often deficient in texture and force,—too "washy." The remarkable interior of "Crosby Hall" (78), is an exception. Among landscapes, besides those already mentioned, is a very fine little broad sketch, called "Down Scenery" (65); a scene in the gorge at Clifton, now spanned by the Suspension-bridge (76), taken at the time the rock was being blasted in preparation for it; "Byland Abbey" (2), a fine sketch; "Norwich Market-place" (13), a large and elaborate drawing with many figures, architecture well rendered, and a beautiful bit of breezy-looking sky; "Draining Mill, Lincolnshire" (25); "Ely Cathedral" (22), a view from the park on the south-east, very rich in the effect of the masses of trees with dashes of sunlight over them; "Woodland Stream" (45), a fine sketch of a romantic landscape, showing a very bold use of colour. All who care for landscape art of a high quality, expressed in a pure water-colour medium, should visit the collection, to which access is generally readily gained through the kindness of members.

A MONUMENT has been erected in the Schloss-platz at Stuttgart, to Dannecker, the sculptor of the well-known "Ariadne and Panther" at Frankfurt.

OF the five etchings by Mr. R. W. Macbeth, after works by Velasquez and Titian, which are on view at Mr. Dunthorne's Rooms in Vigo-street, the finest and most completely successful is that after the portrait of Alonso Cano, in which the reserved and simple grandeur of the original work is fully preserved. Mr. Macbeth has, however, produced a fine reproduction of the much more elaborate work, "The Surrender of Bréda," which is not so suited to the special capabilities of etching as the portrait. The two works by Titian which are represented are the "St. Margaret" (so-called), not a work of the highest interest, and the "Garden of Love," filled with cupid figures under a mass of trees, and with gleams of light in the sky beyond. This is a very fine etching, and it may especially be noticed how very well Mr. Macbeth has succeeded in conveying an idea of the tone and character of Titian's sky,—a kind of sky which is Titian's own property, and at once recognisable even in this translation.

A RECENT but short-lived novelty in Regent-street has been the sign of the "Arts and Crafts Exhibition Society," which for a day or two hung from a splendid pole over the rather obscure entrance to the "New Gallery." It would be recognised at once as the work of the President, Mr. Walter Crane. A winged figure upon one side, the Society's evangel, heralds the union of Art and Craft. On the other, the Artist and Craftsman (the two being so slightly distinguished as to avoid all possibility of offence to the latter) strike hands upon a vow of friendship. Unfortunately, owing to causes with which we are not concerned, this effective sign was removed after a very brief appearance in public.

#### THE SEWAGE QUESTION IN BIRMINGHAM.

THE following account of a visit recently paid by Mr. Charles Hancock, F.R.S., to the Sewage Farm at Sattley and the Interception Works in Montague-street,—where the "pail" contents are treated,—will be read with interest:—

"Tuesday, the 6th inst., was the date of my visit to the works in question; and I may preface the matter by giving a few figures kindly handed to me by the borough engineer, Mr. W. S. Till, C.E.

The total area of the Sattley Sewage Farm is 1,227 acres, of which 888 are freehold, the remainder being leasehold. The total area of the drainage district (which includes Birmingham, Aston, Handsworth, Sattley, Harborne, Balsall Heath, King's Norton, and Smethwick) is

47,275 acres, with a population (in 1885) of 619,693, and with a rateable value of 2,401,093*l*.

The actual cost of the outfall works,—i.e., of the land, tanks, and works for the purification of the sewage,—amounts, for the year 1887, to 34,955*l*.; while the actual income, for the same year, reaches a figure of 20,346*l*, the costs of management, as I understand, forming a separate charge.

I now proceed to describe shortly what I saw, and the results of the various inquiries I made. On arriving at Sattley, I was met by the sub-manager (Mr. Rumble), who gave me the following information:—

During dry weather, the amount of sewage that passes through the sewers on to the farm is 16,000,000 gallons per day. The sewers running on to the farm are three in number, the largest of which is 6 ft. 6 in. high and 9 ft. wide.

For purposes of precipitation, &c., about eleven tons of lime are used daily, that is, every twenty-four hours, machinery being kept in motion day and night.

The lime is first 'slaked' or cooled, remains in bulk for twenty-four hours, is then conveyed into an upper storey of the lime-shed, where it is emptied into a large vessel resembling a brewer's mash-tun. Here it is joined by a portion of sewage pumped from the sewers,—a portion which is emptied into this receiver at the other side. By means of two large revolving stones inside the receiver, the lime is ground to a powder, and the compound of sewage and lime, which by this time is converted into a 'milk of lime,' is run into the 'roughing' tanks, where the grosser impurities are precipitated.

There are three large tanks and sixteen smaller ones, the latter of which, however, are only used under certain circumstances, but which are a valuable auxiliary at times of heavy floods, when the normal quantity of sewage is largely increased. The total capacity of the tanks is 1,169,360 cube feet. From the tanks the sludge is elevated into wooden carriers, which can be moved so as to allow the sludge to flow into any of the beds formed to receive it on that part of the farm. The sludge so elevated is raised by an endless chain of bucket-dredges, the motive-power being supplied by two horizontal steam-engines, in duplicate, with link-reversing motion, by Tangye Brothers (of 20 h.p. each). Both are kept in a perfect state of cleanliness—a circumstance upon which the engineer seemed especially to pride himself. It is only necessary to keep one engine going at a time, the other being kept in reserve in case of breakdown. The cost of the elevation is about 10*s*. per day (including fuel and labour). This part of the farm is superintended by the sub-manager (Mr. Rumble), who informed me he had worked there for nearly fourteen years. Speaking of the tanks, he said two of them were constantly being emptied, while the other one could be cleaned.

Noticing a large deposit at the bottom of one, the question was put by me:—

What is that particular deposit?—This is a deposit which always stops at the bottom, sometimes in very small quantities, and at other times larger ones.

What do you call it, is it detritus?—Yes, and we sell it to the farmers, who are very pleased to buy it.

How long is the sludge allowed to stand on the land before it is touched?—About fourteen days. When it is deposited on the land, it contains a great deal of water, which is allowed to drain away or evaporate. This done, a thick layer, about 10 in. or 1 ft. thick, remains, which is then 'trenched into' the land by spade labour.

Then what follows?—Various crops are planted on the land.

At what intervals do these dressings take place?—Every four years.

I see you have a large conduit here; where does that go to?—To Tyburn. The conduit is 8 ft. wide, and passes the sewage under the river by a syphon arrangement.

Would the sewage that goes to Tyburn be, or answer to the name of, 'precipitated sewage'?—Yes.

Is it not a fact that the sewage matter here is not very strong?—Yes; that is so.

Owing to the small amount of manure ingredient which passes into it?—Yes; it would be better if more manure passed into it.

Do you get any powdered granite in the sewage?—Yes; that comes from the granite paving in the streets. It is passed on to the land with the sewage.

Do you find the land any worse at the end of, say, two or three years?—No. This piece of land (pointing to a large plot upon which some fine cabbages were growing) has been done for the fifth



time, and it is no worse now than it was before. It is quite as good.

Do you grow anything on this part of the farm from the raw sewage?—Yes, we grow cabbages.

Supposing any one said they could taste the sewage in eating any of the vegetables that are grown here; would that be true?—I should say not. I have never heard of such a thing. It would be pure imagination.

You have grown some very fine vegetables here, have you not?—Yes, we have had a cabbage weigh as much as 80 lbs.; while we have a field in which some are often grown at 40 lbs.

How is the precipitated sewage brought on to Tyburn from the conduit?—After passing along the 8 ft. conduit to Tyburn, it is pumped to the higher land there at a cost of about 100*l.* per year.

And do you say that the tanks are emptied by the bucket-droppers?—The whole contents of the tanks are taken out by the buckets; they wait very little cleaning out afterwards. Tyburn is about two miles further on, and here it is that the manager of the farm (Mr. Tough) lives.

I then put the following questions to Mr. Tough:—

Would not the extension of the water-closet system be all the more beneficial to the farm?—Yes, a great deal; because much of the manure which is now taken away in pans (or pails) would be brought on to the farm. This manure in the pans, under the existing system, is sold to the farmers and others.

Do you find the absorption good?—Very good indeed.

I see that Dr. Lawson Tait has been recently interviewed with reference to this farm, and he said, 'The land is being covered by powdered granite and other useless debris at the rate of about an eighth of an inch every year; so that long before the last instalments of the money borrowed for it have been paid it will be choked.' Do you agree with that opinion?—I do not agree with it at all. No land can become clogged if it is properly ploughed; but if you do not plough your land it is sure to become clogged. An ordinary farm that has deposits of manure put upon it, and is not ploughed, will become clogged in time. The land would certainly not be clogged before the last instalments were paid.

Have you land enough?—Yes; but we shall require more as the population increases.

Has irrigation always been in use?—No; ten years ago they used nothing but the tanks.

There is a great deal of iron in your sewage. I notice that a certain Dr. Clay some years ago said: 'Iron ought to be positively excluded from the Birmingham sewage, as it has a great affinity for some of the acids, and would, if not neutralised, be highly poisonous to vegetation were the sewage containing it to any extent applied to growing crops, as, once deposited in the soil, it is only removed by them in small proportions; and it is possible to conceive that by constant deposits of sewage matter containing iron the soil would be unfit for the higher classes of vegetation.' Do you find that so?—No. The lime we use will neutralise and kill all the iron in the sewage. The quantity of lime used by us—that is eleven tons a day—is quite enough to kill anything that comes into the sewage. The lime is both for this purpose and for precipitation. If you look at these cabbages you will see that well enough.

Do you use much raw sewage?—Very little.

Is the whole of the sewage absorbed by the land. Does it go through the pores of the land?—It is not absorbed. It goes through the land into the drains.

I suppose you mean in the form of effluent?—Yes.

How do your cattle thrive on the land?—Very well. They never have anything the matter with them, except a cold or something of that sort. They have nothing ever ailing them that arises from the land. A large dairy stock is kept on the farm, and the yield of milk is very good.

Do you have any complaints of nuisances arising from irrigation?—None whatever.

How many are employed on the farm?—Altogether—that is, men and boys,—about two hundred.

Does the irrigation affect their health?—Not at all; they are all remarkably healthy.

What crops do you grow?—Potatoes, mangolds, parsnips, carrots, kohlrabi, cabbages, rhubarb, and Italian rye-grass.

Do you find a good sale for the rye-grass?—Yes, we get 15*s.* per ton for it, and the buyers come and fetch it themselves.

How much land have you upon which your rye-grass is grown?—About seventy acres.

And how many acres have you under irrigation at a time?—From 100 to 150 per day.

What land do you irrigate during the winter?—All the fallow land.

Are any of the potatoes grown on the land affected with disease at all?—No; they are remarkably free from disease.

Do you have to purchase any manure? None at all. We use the manure from our own stables, but have no other. Neither do we use any artificial.

What becomes of the storm-water?—It goes into the river.

But in time of floods does not the whole system

become more or less disarranged?—Only for the time being,—that is, for a few hours, during which time we get more than the normal quantity of sewage.

Take July in this year for instance; did that affect the land?—Oh! not at all. This year's rain has not affected us.

Is the whole farm under-drained?—Not all of it, but it will be in another twelve months.

Have any improvements been made during the time you have been here?—Well, yes, the drains were formerly a chain apart, now they are being put half a chain, and when that is done the whole of the land will be properly drained.

What about the effluent water?—That runs into a culvert and thence into the river. The culvert is two and a half miles long. If you will come here, you will see the whole thing. After being emptied out of the pans, excreta is dried and thence converted into 'poudrette.'

Mr. Tough then led the way to the edge of the farm until the culvert was reached. The water which was running down it was perfectly clear and odourless, while a stream under the spot where he stood sparkled with remarkable purity. Stooping down, Mr. Tough brought up some in the scope of his hand, and upon applying one's nose to it, no trace of stench or smell of any kind could be discerned. Mr. Tough seemed genuinely enthusiastic at this point, and said, 'At the other side of the farm you saw the raw sewage come in: here you see it go out as effluent.' Questioned as to the depth of the under-draining, Mr. Tough said he had one at a depth of 4 ft. 6 in., and that would probably be the average depth.

*Interception Department, where the 'pail' contents are treated.*

This is in Montague-street, in the midst of a very populous district, about half a mile from the centre of the town. The department covers nearly 14 acres, and gives employment to about 300 men. The manager is a Mr. Wilkinson, but he being absent, the chief engineer (Mr. A. Lyall) explained the process.

Do you get ammonia in the excreta?—Yes; there is a good deal of ammonia in it. This is 'fixed' with sulphuric acid, then dried, and so made into poudrette.

Do the people in the neighbourhood complain of the smells?—Not at all. There is but little smell, and any one working here, or living close by, would not notice it.

Do you get a ready sale for the poudrette?—Yes, a very ready sale. Last year we could not supply it fast enough.

What price do you get for it?—It averages 6*l.* per ton, although we have got as much as 6*l.* 10*s.*, and many of the buyers fetch it away with their own carts.

Do they get much ammonia in the manure at the farm? No, they do not. We get 7½ per cent. of ammonia in ours.

What system do you call this?—This is the Rochdale system,—that is, the mixing of fine ashes with the excreta. It is taken, as all the 'pail' systems are, from Rochdale.

Have you introduced any improvements at these works?—Yes; we have introduced hot air into the cisterns instead of cold air.

Do any farmers buy the excreta before it comes to you?—Yes; several of them.

How often are the pans emptied?—Once a week. The men are sent out in charge of the waggons, and are supplied with a list of houses to which they are to go. The privies are always open to them, and they take out the full pan and in its place put the empty one. The ashes and other refuse are in a tub which they empty on to the end of the wagon, while the pans are put inside.

On the 7th inst. I was favoured with an interview at the Council House with Mr. Alderman Avery, J.P., the Chairman of the Birmingham Tame and Rea District Drainage Board. He admitted that the precipitation process 'by itself did a great deal, but it was uncertain in its operation.' It had, further, this virtue about it,—it gave the land so much less to do. He also insisted on the fact that one acre of land was as efficient for all purposes as eight or ten acres would be, unaccompanied by the preliminary precipitation treatment as in operation at the Salford Farm. As to the proposals at various times put forward for irrigating the London sewage on the intermittent filtration plan or otherwise, he wished to remark that in his (Alderman Avery's) judgment the irrigation system was even more applicable there than in Birmingham, and for this reason: with them the volume of the river Tame was below the flow of sewage, but in London that of the Thames was 400 times above the sewage-flow.

Reverting to Birmingham, he said the Corporation had had sixteen years' experience of a sewage farm, but had worked the wider area only eight years. In a word, they had tried this system all these years, and, on the whole,

were abundantly satisfied with the results obtained.

I also called upon Dr. Lawson Tait, late chairman of the Health Committee of the Corporation, from whom I heard a somewhat different story; but he acknowledged that the death-rate of Birmingham, in his time, had fallen to 19 per thousand of the population; and this he attributed to the admirable sanitation carried out of recent years by the town authorities.

Since writing out these notes, I have this morning (9th inst.) received the following letter from Mr. Till, C.E., the Borough Engineer:—

"Council House Engineer's Office,  
Birmingham, Nov. 8, 1888.  
Chas. Hancock, Esq.,  
London.

DEAR SIR,—As promised yesterday, I forward herewith printed copy of estimates of income and expenditure of the Drainage Board for the current year, with which you will find statements of the income and expenditure for 1887.

The Books of the Health Department of the Corporation have not been kept so as to show separately the cost of dealing with the pail contents and old asphalt refuse since 1883. On the other side I send you statement of income and expenditure in respect of this work for that year.—Yours, faithfully,  
(Signed) WILLIAM TILL.

*Copy Inclosure (above referred to).  
INCOME AND EXPENDITURE  
OF THE  
HEALTH DEPARTMENT OF THE CORPORATION OF  
BIRMINGHAM  
FOR THE YEAR 1883.*

*Old Department (Privies and Asphalts).  
Income, 1,928*l.* 7*s.* 11*d.* Expenditure, 11,690*l.* 17*s.**

*New Department (Pails and Tubs).  
Income, 9,690*l.* 12*s.* 10*d.* Expenditure,  
33,024*l.* 10*s.* 4*d.*"*

#### THEORY OF ARCHED STRUCTURES.\*

In dealing with the theory of arched structures, the author has endeavoured to put the subject before the Architectural Association in as practical and simple a manner as possible.

We may theoretically divide arches into two classes: (1) treating of arches constructed of blocks of stone or brickwork, termed "voussoir arches"; and (2) treating of structures which are continuous partly or throughout, and which are termed, for distinction, "elastic arches."

In a short paper it would be impossible for the author to endeavour to exhaust the whole subject of arch construction. He has, therefore, confined his remarks to those arches which are made up of cemented blocks, as the elastic arch belongs more to the province of civil engineering, whereas the voussoir arch plays an important part in nearly all structures designed by an architect. The laws which govern the stability of arches are the same for arches of any shape or form, whether applied to a bridge, vault, dome, or to any other arched structure. With this assumption it will be immaterial what form of arch the author illustrates to enable him to elucidate the theory, as any other form of arch can be treated in a similar manner. As a basis, it is usual to assume that each bed-joint in an arch-ring acts as a hinge about which the voussoirs are free to turn, and no allowance is therefore made for the adhesion of the mortar in the joints, so that to obtain stability the arch should be in equilibrium throughout.

There are many reasons why the adhesion of the mortar should not be considered: first, that in some cases mortar between the voussoirs has been left out altogether, and sheet lead substituted; secondly, that the mortar or cement, although generally good, may, through carelessness, be inferior in some of the bed-joints; thirdly, that an accumulation of dust, and neglect to saturate the surface of the material with water, may effectually prevent proper adhesion; and fourthly, vibration of the centres may be produced by the deposit of material, or movement may be caused by the varied positions of the loads as the work advances up the haunches.

In arches there are three different causes of failure, which the author has dealt with in the following order:—

- (1) The arch may not be in equilibrium, and may collapse by altering its form.
- (2) The stones may be crushed.
- (3) The voussoirs may slide on their bed-joints.

\* By Mr. Arthur Thomas Walmisley, M.Inst.C.E. being a paper read before the Architectural Association on the 18th inst., as elsewhere mentioned.



The curve of equilibrium being an imaginary line representing the centre of pressure throughout the arch (supposing that the material were strong enough to resist crushing), the whole of the arch-ring might be removed except that portion immediately around the curve, and the arch would still remain perfectly stable.

To render this thoroughly intelligible, let us imagine a cord suspended between two points (fig. 1), and weighted with equal weights at

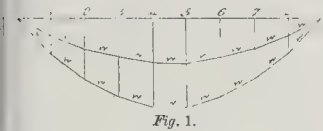


Fig. 1.

points 1, 2, 3, &c., then the position of repose of the cord will be the curve of equilibrium for the loads acting on it, and if the parts of the cord W, W, W were bars simply jointed at the weights, it could be inverted, as in fig. 2, and

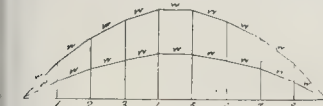


Fig. 2.

thus form a polygon in equilibrium, with the line of pressure along the centres of the bars. In the diagram two curves are shown for the same loading, and this line of pressure would be the curve of equilibrium for an arch loaded in the same way as the cord, and would also assume exactly the same curve as the suspended cord.

The curve of equilibrium changes its form for every alteration of load, except when all the weights are altered in the same ratio, in which case the load can be augmented or diminished, and the same curve maintained.

One of the conditions usually adopted with regard to the curve of equilibrium is that it should everywhere be within the middle third of the arch-ring—that is to say, if we divide the depth of the arch (fig. 3) into three equal parts,



Fig. 3.

forming concentric rings, the curve should everywhere be contained in the middle ring.

This appears at first sight to be rather an arbitrary condition, but can be easily explained.

It is a well-known fact that all bodies are elastic, so that they will be extended or compressed according to the nature of the stress put upon them, and as we cannot have a tensile stress in masonry or brickwork without taking the mortar or cement into account, we must so distribute our pressures that no tensile stress will be set up. It therefore becomes a question how far the line of pressure may deviate from the neutral axis of the arch without a tensile stress being produced.

No doubt it has frequently been observed that if a plank of wood floating on water is loaded at one end, the loaded end will sink below the surface, while the unloaded end will rise above the surface until equilibrium is obtained, or, in other words, until the centre of buoyancy of the plank is coincident with what we may term the centre of effort of the water. The rise and fall of the ends of the plank relative to the water surface depend upon the position or amount of the weight placed upon it, and it will be found that the bottom of the plank at the higher end will just be level with the surface when the centre of gravity of the united weight of the plank and imposed load is one-sixth of the length of the plank from its centre.

This same law can be applied to masonry, for, the stones being elastic, the compression of its particles will be in proportion to the weight supported; and when the centre of pressure is removed one-sixth of the length of the bed-joint from the centre, the edge of the stone

furthest from the load will be relieved from pressure and become just on the verge of tension, which is a parallel case with the bottom surface of the plank at the furthest end being just level with the water.

When the curve of equilibrium or curve of pressure is anywhere within one-sixth of the length of the bed-joint from the neutral axis of the arch upon either side, it will be in the middle third, and no tension will be produced. As the curve of equilibrium approaches the edges of the arch-ring, tension will be produced, which will gradually increase until the curve passes outside the arch-ring, causing it to collapse, but practically the arch would collapse much sooner from the crushing of the material.

Where the curve rises above the extrados of the voussoirs the arch would sink, and where the curve passes below the soffit the arch would rise, as shown in fig. 4.

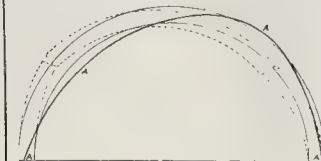


Fig. 4.

An infinite number of curves of equilibrium can be drawn for the same loading, depending upon the rise given to the curve.

The selection of the true curve generally requires some preliminary consideration, and may be determined on the basis of Moseley's principle of least resistance. The late Professor Rankine, in his "Applied Mechanics" (p. 215, Article 196), thus states this principle.

"If the forces which balance each other in or upon a given body or structure be distinguished into two systems, called respectively 'Active' and 'Passive,' which stand to each other in the relation of cause and effect, then will the passive forces be the least which are

greatest rise and least span. As the middle third has already been fixed for the limit of the curve, it is obvious that the greatest rise given to the curve must be the outside limit of the middle third, and the least span the inside limit of the middle third.

In selecting the curve, it may be found that a curve which touches the middle third at the crown and springing will be outside the limit at some other point, and we may be able to bring it everywhere within the limit by slightly moving the crown and springing further inside the limit. In that case the curve, which falls everywhere within the limit, and which approaches nearest to the limit both at the crown and the springing, will be the curve to be selected.

To approximately determine the depth of the arch-ring at the crown, we can apply empirical formulae founded by Rankine on the dimensions of good existing work.\*

They are as follows:—

Depth of keystone for a single arch in feet

$$= \sqrt{(12 \times \text{radius at crown})}$$

Depth of keystone for an arch of a series in feet

$$= \sqrt{(17 \times \text{radius at crown})}$$

The depth of an arch-ring does not depend upon the crushing strength of the material so much as upon the curve of equilibrium, which usually requires wide limits to provide for the necessary stability, and thus gives an area many times greater than is required to resist direct crushing,—in practice the proportion has varied between 3 and 70, but the above formulae by Rankine are based upon examples varying from 20 to 40.

Having approximately designed an arch, the curve of equilibrium can be drawn; but should the required conditions not be satisfied, the design will require modification, either by increasing the depth of the arch-ring, altering the rise, or altering the loads on the arch.

To construct the curve of equilibrium the horizontal axis of the arch (fig. 5) must be divided into a convenient number of parts, and the vertical weight calculated for the load on

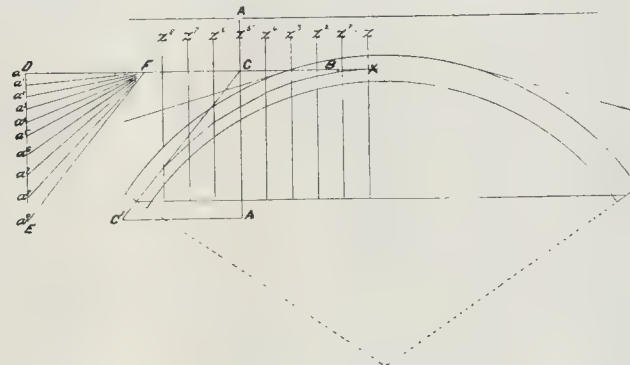


Fig. 5.

capable of balancing the active forces consistently with the physical condition of the body or structure."

Now it is clear from this statement that the best curve to select is that which produces the least horizontal thrust.

If a rope is stretched between two points so that the deflection is one-fourth of the span, and a similar rope is stretched in the same manner so that its deflection is half the span, it will be evident that the rope which has the least deflection, or which is stretched the tightest, will have the greatest horizontal stress, and it will be found that the horizontal stress varies in an inverse proportional to the deflection of the rope, so that the rope with half the deflection will have twice the horizontal stress of the other. Any rope, whatever the span, must theoretically have some deflection, even when unloaded, such deflection being due to its own weight.

"There is no power, however great,  
Can pull a cord, however fine,  
Into a horizontal line  
That shall be absolutely straight."

These conditions will be exactly the same for an arch, and will determine the position of the curve according to Moseley's principle,—that is to say, the curve to be selected is that with the

each division, including the weight of the arch. Through the centres of these divisions let the several lines marked z, z, z, be drawn representing the centres of effort of the load. Line A A represents the position of the centre of gravity of the whole of the loads on the half-arch, and is obtained by taking moments round the point in the springing selected for the curve of equilibrium to pass through,—that is, by multiplying each weight in the half-arch by its horizontal distance from this point in the springing, and dividing the sum of these products by the sum of the loads, we obtain the horizontal distance of A A from the springing-point round which moments were taken.

For arches having symmetrical loads upon each side of the centre it will only be necessary to determine the curve for half the arch, as both sides will give the same result.

From the upper limit of the middle third, X, at the crown of the arch, draw a horizontal line until it cuts A A in C. This will represent the direction of the thrust at the crown, which will always be horizontal under the influence of symmetrical loads. Then from point C draw line C C' through the inside limit of the middle third at the springing. Lines C C' and C X will form a polygon in equilibrium, supposing all

\* Rankine's "Civil Engineering" (Tenth Edition), Art. 280.

the loads in the half-arch to be acting at their centre of gravity, and thus the direction of the thrust at the crown and at the springing is determined. To find the amounts of these thrusts, from C plot downwards, with the use of a convenient scale, a length CA equal to the sum of the loads upon the half-arch, and from point A draw AC' parallel to CX until it cuts the oblique line in C', then the lengths CC' and C'A will measure the amount of thrust at the springing and at the crown respectively. Let XC be produced to any point D, and from D set off a length DF equal to C'A, and a line DE drawn downwards equal to CA vertically to represent the sum of the loads on the half-arch, then DE can be divided into parts  $a, a', a'', a'''$ , equal respectively to loads  $z, z', z'', z'''$ , remembering to commence with the load nearest the crown. Then the vector lines drawn from the point F through  $a', a'', a''',$  &c., will give the elements of the polygon required to form a curve of equilibrium, and the stress in any part of the arch can thus be arrived at graphically.

To construct the curve of equilibrium draw from the point X, which is the point of intersection of the thrust at the crown with the first load  $z$ , a line parallel to  $a'F$  until it cuts the next vertical line  $z'$ , and from the point thus obtained draw a line parallel to  $a''F$  to the vertical line  $z''$ , and so on until the curve is completed. If this be done correctly, the line parallel to the line  $a^3F$  will exactly join up at the point of intersection of C' with the springing. The amount of these forces at any point in the arch can be found by scaling the vector lines  $a, a', a'',$  &c., in the force diagram. It will not always be possible to obtain a curve which will fall within the proper limits at the first trial, although this may not render necessary any alteration to the arch. An example of this is shown in fig. 6, where the curve on the right-hand side, although brought to the centre of the limit at the crown and springing, is seen to be outside the middle third about half-way up the haunches, while on drawing a curve as shown on the left-hand side, where it touches the inside limit of the middle third at the crown and springing, it will be seen to pass everywhere within its proper limits, and will therefore be the true curve to select.

It will be noticed that the weight of the arch is divided into an even number of parts, but this is not at all necessary, although it simplifies the calculation. If the weight had been divided into an odd number of parts, one of the parts would have been at the crown of the arch, and would have required halving before the force diagrams were drawn, as half of it would belong to each side of the arch.

If the loads on an arch are not symmetrical, a similar method of obtaining the curve can be adopted, but it is a little more difficult, as the curves on each side will be different, and the thrust at the crown will not be horizontal, thus involving the extra labour of drawing the force diagram for both sides.

Suppose it be required to draw the curve of equilibrium for a span of 36 ft. (fig. 7), loaded at each of the points  $z, z', z''$  on the left-hand side of the crown, with weights of two tons, and at the points  $z, z', z''$  on the right side of the crown with loads of four tons. The difference in this case is that the curve is to be found for the assumed loading, and the arch designed to suit the curve, whereas the previous case was one in which the arch was designed at the outset.

The loads on the whole of the arch may be assumed to act at their centre of gravity A without altering the reactions of the abutments. The distance of A from either abutment equals the sum of the loads multiplied by their horizontal distances from the abutment from which A is to be measured, and divided by the sum of the loads.

The stress polygon for the whole of the loads acting at A would be two straight lines drawn from Y and Z to any point in A, and their direction would also be the direction of the tangents at the springing of the curve of equilibrium for the loads acting at their true positions.

Extending the method a little further, we can find the centres of gravity BB and CC of the loads between A Y and A Z, the segments into which A divides the arch.

If the rise of the proposed arch is already fixed, the line of thrust must pass through that point, so that in the case of the load being concentrated on line AA the height of the point X would equal the rise of the arch; but by assuming the load concentrated at BB and CC the height of X must be such that a line drawn

through the points of intersection W, W' of XY and XZ with BB and CC will pass through the fixed height V at the crown of the curve. The height of X can thus easily be arrived at after one or two trials.

The stress polygon for the load acting at the two points upon each side of the crown will be YW, WW', W'Z, which indicates the direction of the thrust at the crown and springing.

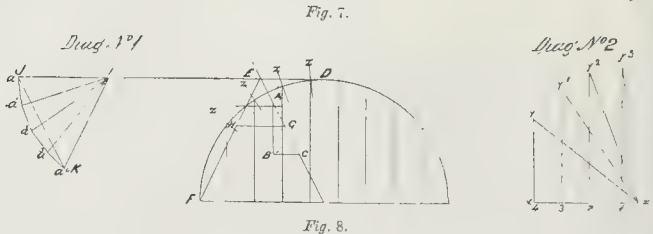
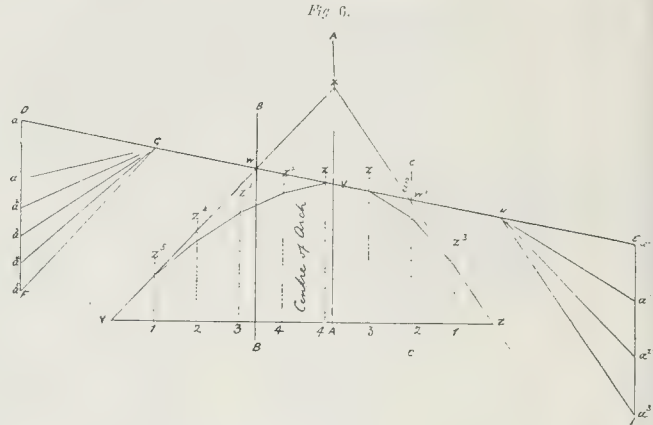
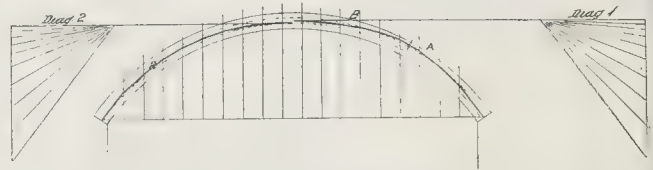
Let WW', the direction of the thrust at the crown, now be produced to any convenient distance, D and E, and from the points D and E draw vertical lines indicating the direction of the loads, and each equal in length to the sum of the loads on the half-arch to which they correspond.

From F and I draw lines FG and IH parallel to YX and XZ.

The lines DG and HE will be equal to, and will measure the thrust at the crown, while FG and HI will measure the thrust at the springing points Y and Z respectively. Divide DF

horizontally before it can be properly determined. From any point  $z$  (diag. No. 2, fig. 8), draw lines  $z, z', z'',$  &c., parallel and equal to the pressures  $z, z', z'',$  &c. on the arch, from  $y, y', y'',$  &c., let fall perpendiculars cutting the horizontal line XX in the points 1, 2, 3, &c.: then the horizontal lengths  $z, z', z'',$  &c., will measure the horizontal components, and the vertical lines Y 4, Y' 3, &c., will measure the vertical components of the forces to which they correspond. This may be drawn to any scale. The point through which the resultant passes can now be found by taking moments with the horizontal and vertical components of the forces round the springing point F, and thus fixing both the vertical and the horizontal distance of this point. The sum of the products of the horizontal components into their vertical heights from F, divided by the sum of the horizontal components of the forces, will give the vertical height of the resultant, and its horizontal distance can be obtained in a similar manner.

These two distances are next plotted on the



and EI into parts  $a, a', a'',$  &c., equal to the separate loads  $z', z'', z''',$  &c., commencing with the loads nearest the crown, and bearing in mind that each diagram corresponds to the half of the arch on which it is drawn; then lines  $a, a', a'', a''',$  &c., will be the elements of the curve of equilibrium which can be constructed by drawing lines parallel to them between the lines  $z', z'', z''',$  &c., as in the previous example.

Another problem which occurs in practice is the consideration of an arch acted upon by oblique pressure in which the horizontal thrust is not constant throughout, as in the case of an arch acted upon by vertical pressure, but changes from point to point.

Let fig. 8 represent an arch acted upon by oblique pressures, equal in magnitude, and everywhere normal to the arch. In this case the loading on both sides of the arch is symmetrical; therefore the curve for one half only need be drawn, as the thrust at the crown will be horizontal. The resultant pressure of the loads upon the half-arch being inclined, each load must be resolved both vertically and hori-

zontally before it can be properly determined. From any point  $z$  (diag. No. 2, fig. 8), draw lines  $z, z', z'',$  &c., parallel and equal to the pressures  $z, z', z'',$  &c. on the arch, from  $y, y', y'',$  &c., let fall perpendiculars cutting the horizontal line XX in the points 1, 2, 3, &c.: then the horizontal lengths  $z, z', z'',$  &c., will measure the horizontal components, and the vertical lines Y 4, Y' 3, &c., will measure the vertical components of the forces to which they correspond. This may be drawn to any scale. The point through which the resultant passes can now be found by taking moments with the horizontal and vertical components of the forces round the springing point F, and thus fixing both the vertical and the horizontal distance of this point. The sum of the products of the horizontal components into their vertical heights from F, divided by the sum of the horizontal components of the forces, will give the vertical height of the resultant, and its horizontal distance can be obtained in a similar manner.

These two distances are next plotted on the diagram, and are found to intersect in the point A.

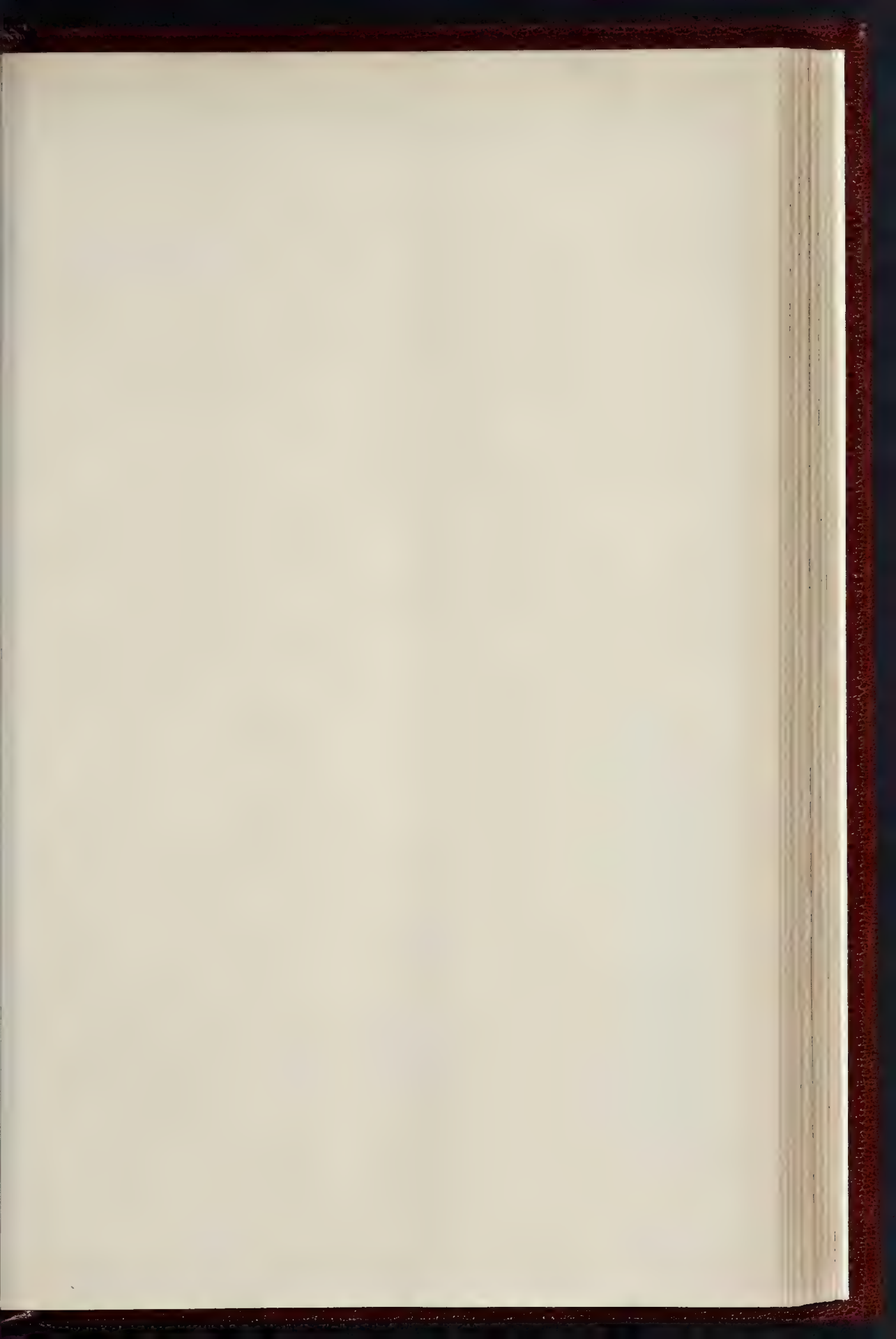
From A (fig. 8) the line AB, equal to the sum of the vertical components of the loads, is plotted downwards, and from B thus found the line BC is plotted horizontally, equal to the sum of the horizontal components; the oblique line passing through AC gives the direction of the resultant pressure of all the forces upon the half-arch, and its magnitude is represented by the length between AC.

The line of pressure DE at the crown of the arch is in this case horizontal, and is drawn through the oblique resultant, cutting it at E, and from E the line EF is drawn, which indicates the direction of the thrust at the springing.

To find the magnitude of the thrust at the crown and springing, make EG equal to AC, and from G draw a horizontal line cutting the line EF in H. EH will then measure the thrust at the springing, and HG the thrust at the crown.

The curve of equilibrium for each weight acting separately can be obtained by drawing







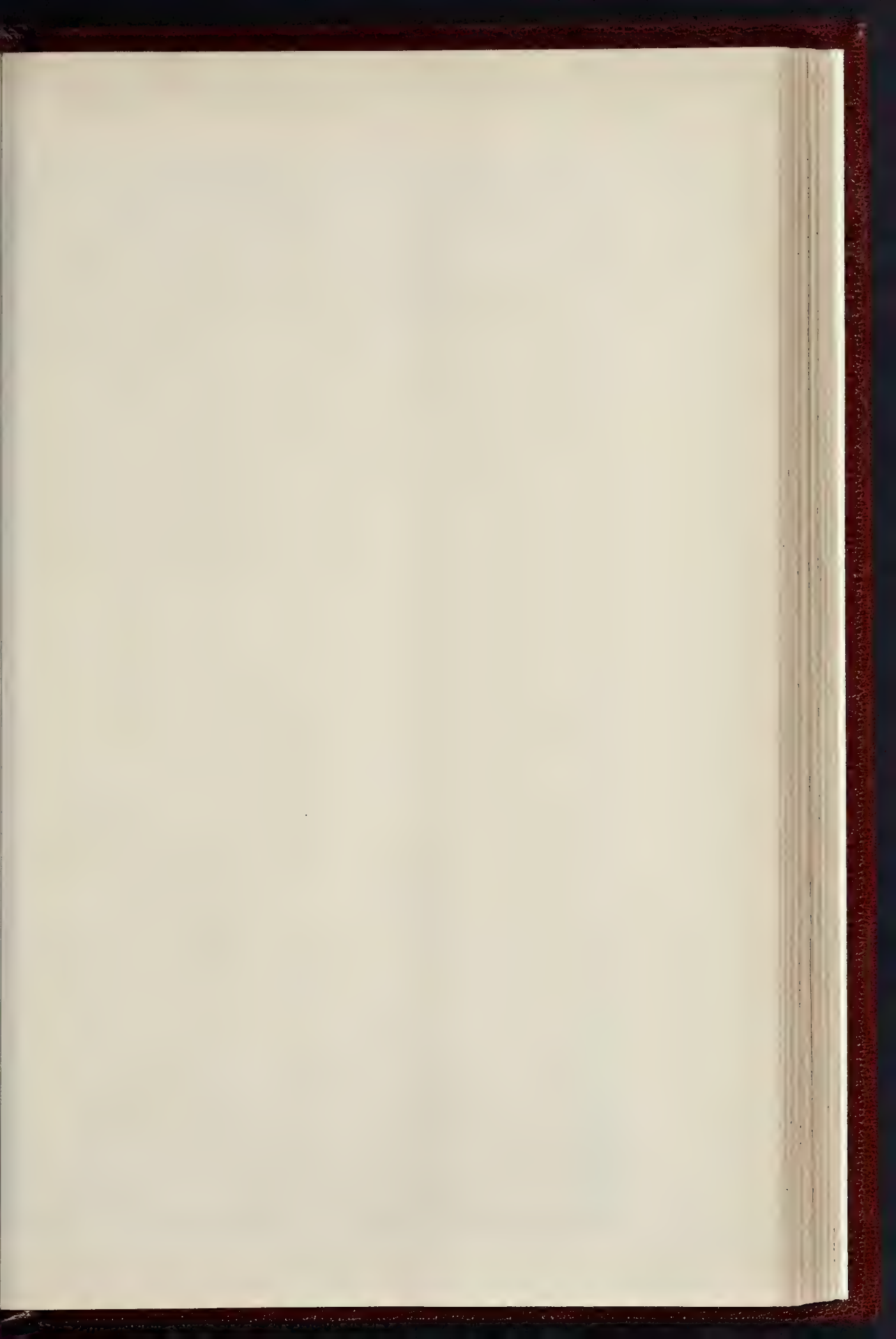




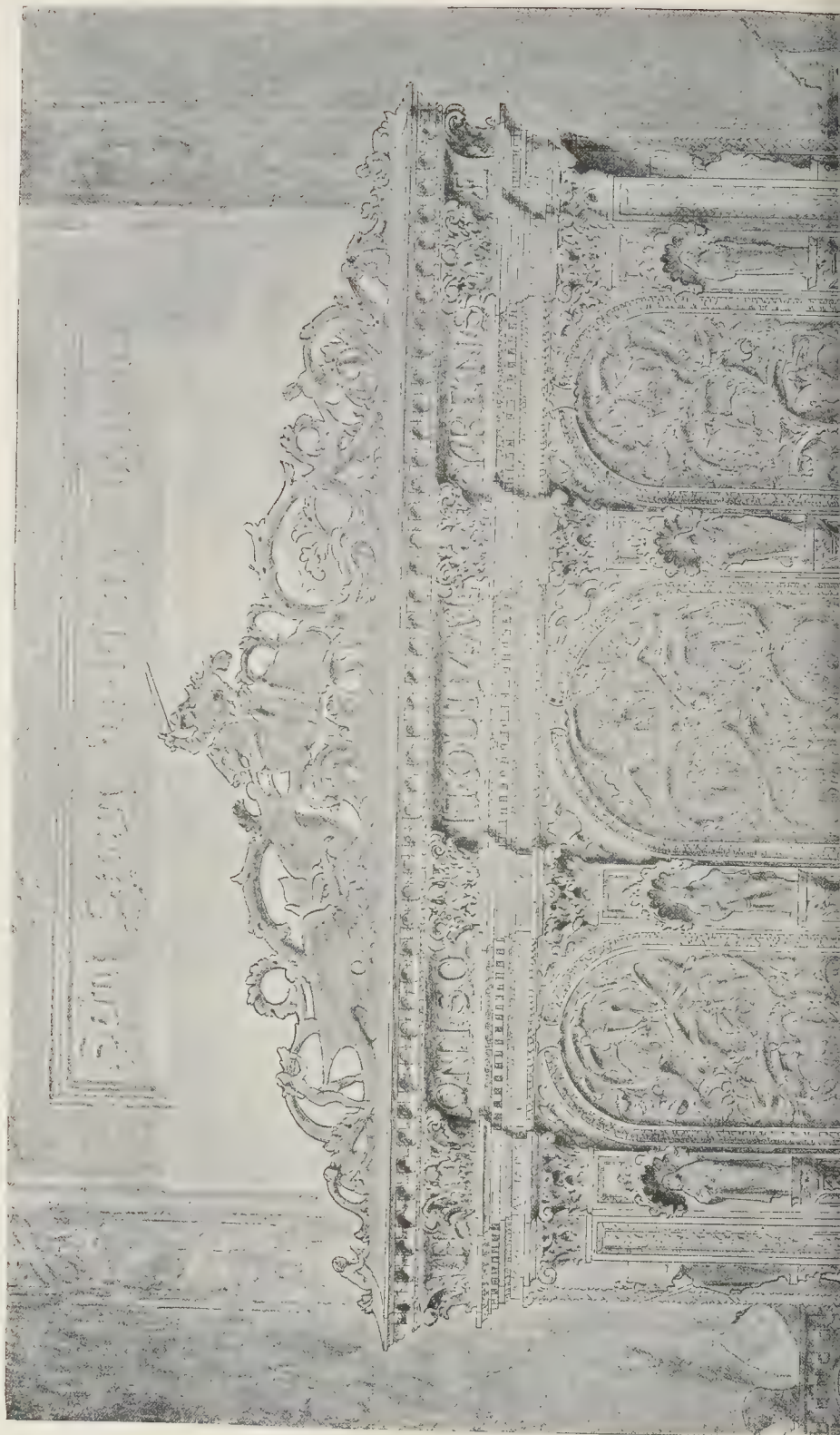
MINUS.—By MR. W. H. BONEY.







THE BUILDER, NOVEMBER 24, 1888.





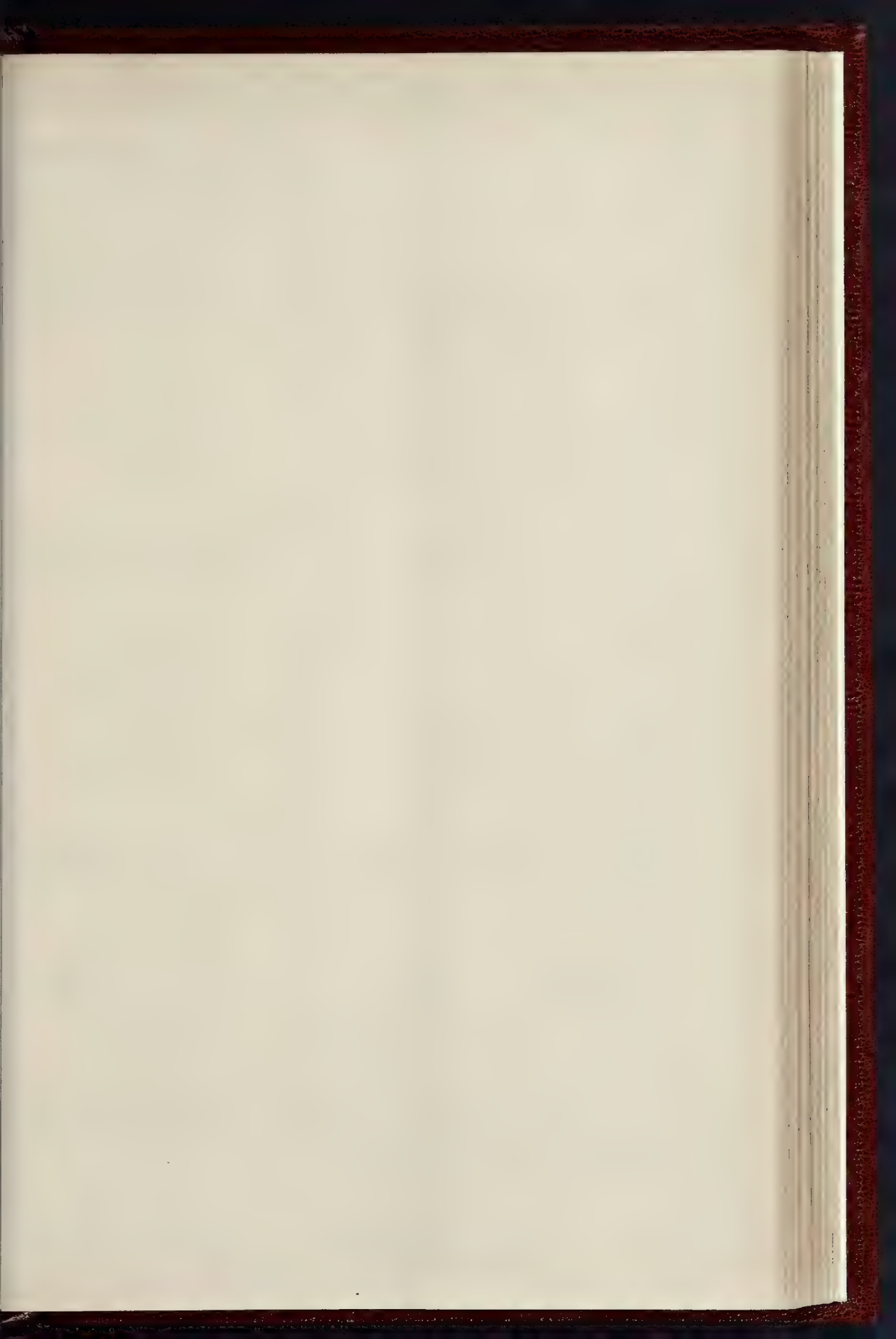


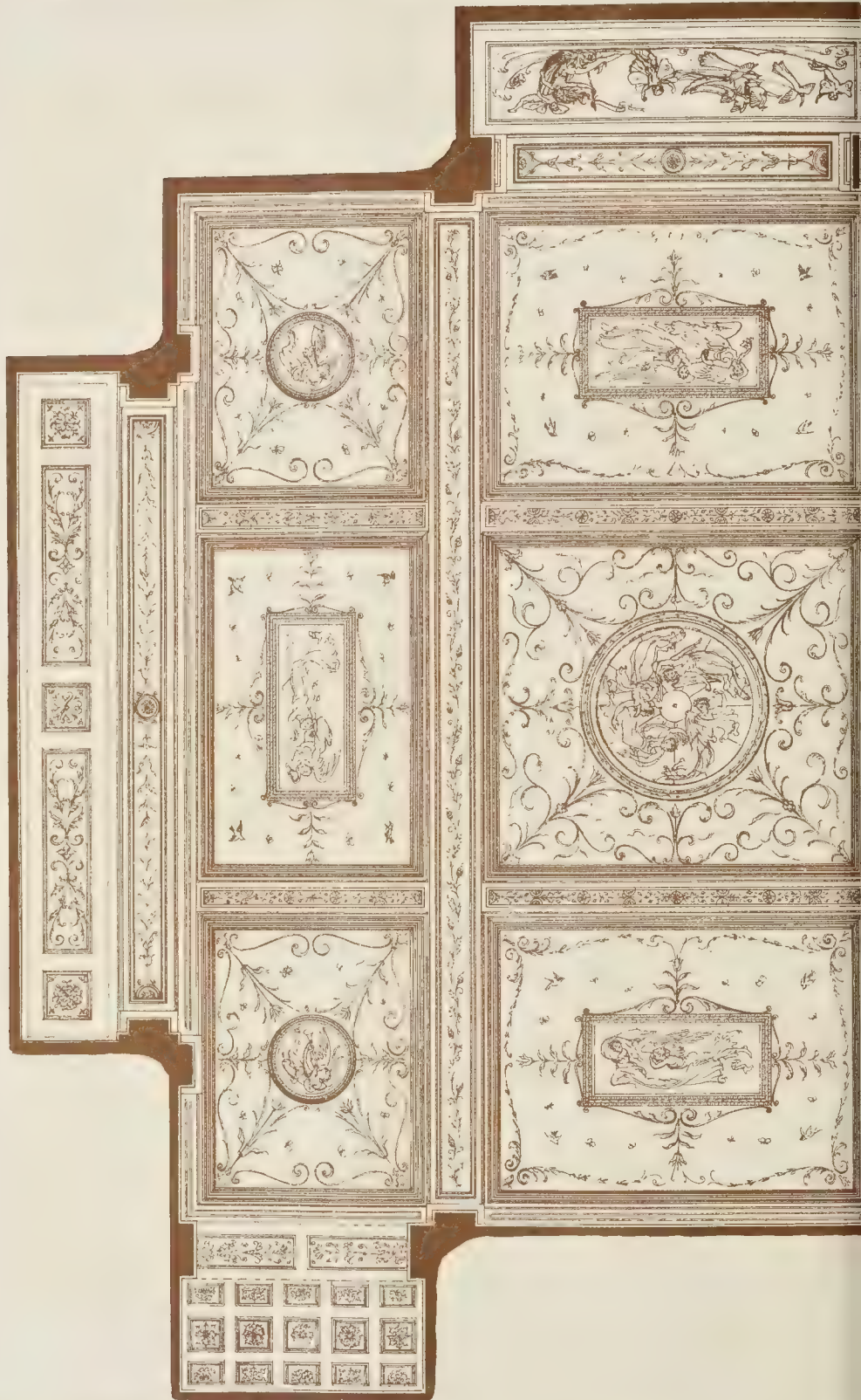
DESIGN FOR A CHIMNEY-PIECE. BY MR. T. HUNGERFORD POLLEN.

The Phototype Co., 33, Strand, London.













PLAN OF CEILING.

0 10 20 FEET

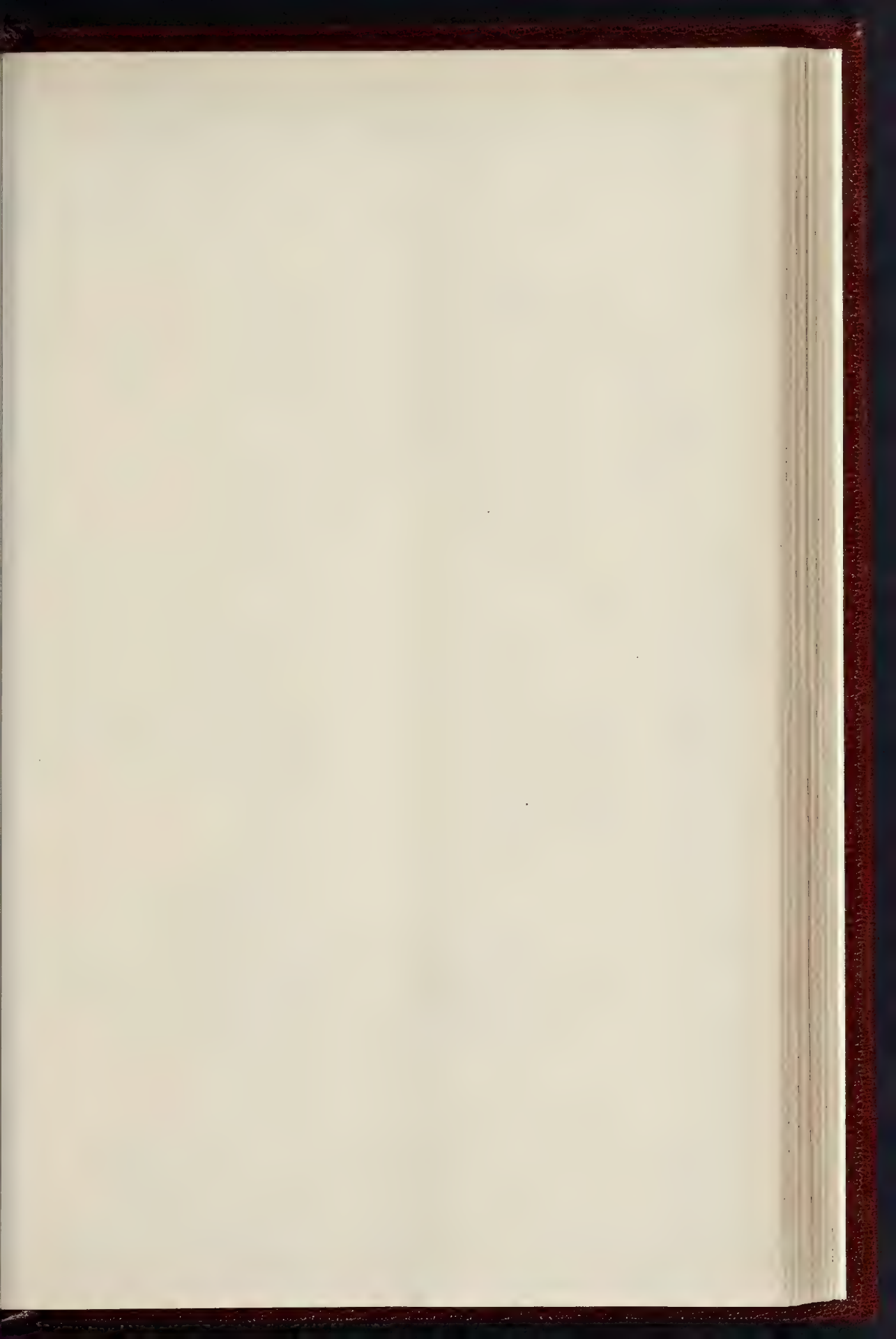


ELEVATION OF ONE WALL.

DECORATION FOR DRAWING ROOM.—DESIGNED BY MR. GEO. AITCHISON, A.R.A.; FIGURES IN PANELS BY MR. S. P. COCKERELL.





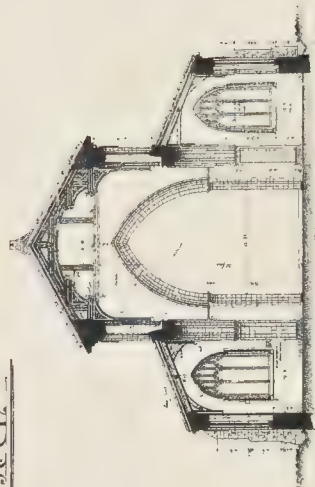
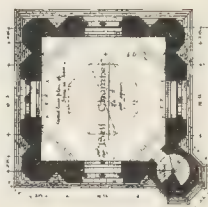


THE BUILDER, NOVEMBER 24, 1888.

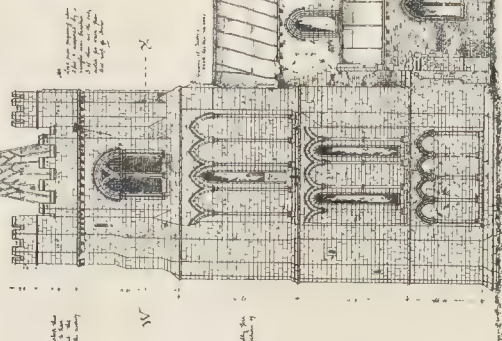
# Elm Church de Wisbech

## South Elevation

Point of View at W. N.



Grundriss Section in line C D looking East



St. A. Church 177-178-8

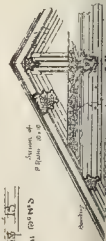
South Elevation



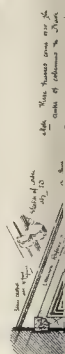
Section of Nave and North Aisle Roof



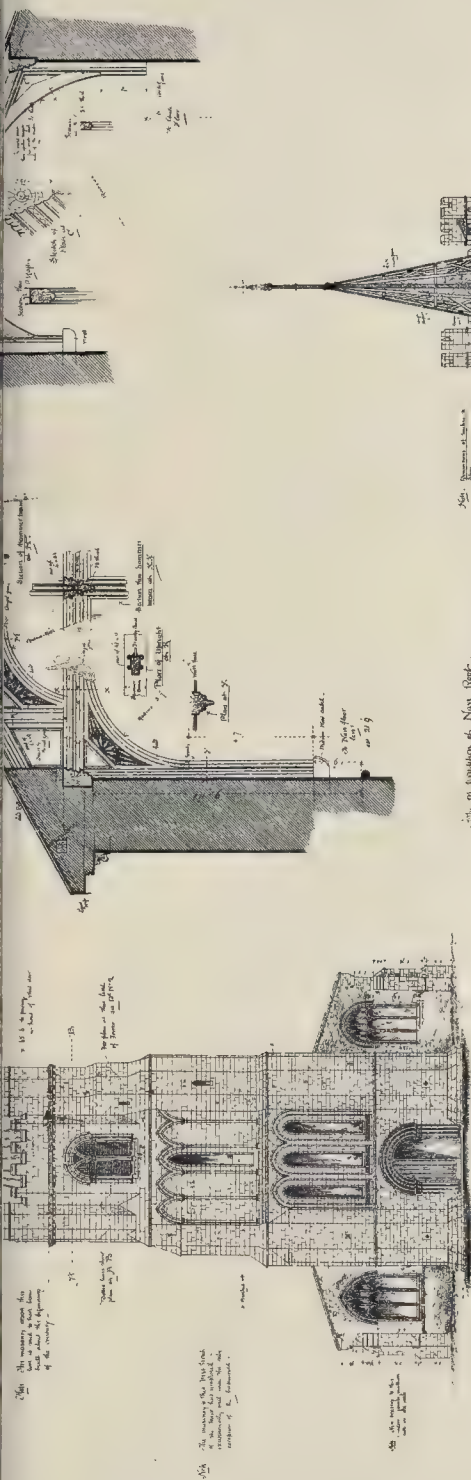
Elevation of Organ Case  
Looking West



Elevation of Organ Case  
North Side, looking West







See on elevation of West Front.  
 The plan of the transept is the same as the plan of the West Front, but the transept is smaller than the West Front. The transept is a rectangular structure with a central aisle and side aisles, and a small square tower at the end.

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Choir  
 Apse  
 Transept



PHOTO. THE SPARKLE & CO. 22, MARK LANE, LONDON, E.C.

DRAWN BY MR. S. K. GREENSLADE.





diagram No. 1 (fig. 8). DE is produced to any point J, and from J, JI, JK, and KI are set off, to any convenient scale, equal and parallel to GH, EG, and EH respectively. The line JK, being equal and parallel to the resultant of the

the resultant, or in draughtsmanship. The vector lines drawn from I through  $a^1, a^2$ , &c., will give the elements of the curve of equilibrium which are drawn between the lines  $\pm z$ , &c.

In this case the lines of force  $\pm z$ , &c. do not

ture, and fig. 9 shows a vertical section through a dome to illustrate the application of the foregoing theory to complex examples.

Although most of the foregoing diagrams may also refer to engineering as well as architectural work, they are of quite as much interest to the architect in illustrating the theory as if other more familiar examples had been chosen.

Diagram 1 of fig. 9 represents a plan of a dome which, for purposes of calculation, has been divided into ten parts by radial lines, and the weight is taken for any one of the portions, such as that shaded in the diagram, which, in principle, becomes the same as the arch.

The transverse section shown in fig. 9 is taken through A B on plan. The load is assumed to act at five points on each side of the centre, as shown in the vertical section, and the nearest points upon either side of the centre are so arranged as to be directly under the walls of the tower above. The cube measurement of the masonry carried at each point is found by measuring its thickness on the section, and multiplying it by the corresponding width between the radial lines on the plan.

The stress diagrams are worked in precisely the same manner as fig. 5, and therefore will not need further description.

The point to be noticed with regard to this structure is that the dome itself is perfectly stable, as the curve of equilibrium is everywhere well within the limits of the middle third, while the walls which support the dome would be thrust outward and cause the dome to collapse were they not strengthened in some way to resist the outward thrust.

The overturning action is indicated by the direction of the thrust  $CC$  upon the right-hand side of fig. 9, which will be seen to cut the extreme edge of the wall at  $H$ . This should be within the middle third of the wall to ensure stability.

It will be noticed that the curve of equilibrium does not commence at the springing of the dome, but at a point  $C'$  some distance above it. The reason for this is that a chain forming a belt round the dome was assumed to act at this point, it being foreseen that the conditions of stability could not be fulfilled without this addition. This chain fixes the position of the curve of equilibrium at the springing, and resists the horizontal component of the thrust  $CC'$ , so that the thrust below the chain is all vertical and fulfils the required condition of stability.

The stress in the chain is very easily arrived at, as the plan, diag. 1 (fig. 9), was divided into ten parts, two of which were considered to act as an arch, the pressure C B at the springing (fig. 9) will act at ten points round the dome, and the horizontal component A B in this figure will be the pressure on the chain at each point P, P, &c., diag. 2 (fig. 9). For purposes of calculation, the chain is assumed to be divided at A and B, and the thrusts P, P, &c., resisted by two forces indicated by the arrows at A and B. Each thrust P is resolved into components drawn parallel and at right angles to the direction of tangents to the curve at A and B, so that the sum of the tangential components will equal the sum of the tensile stresses in A and B—that is to say,  $\Sigma f = 2 S$ ,  $S = \frac{\Sigma f}{2}$  where  $f$  = tangential components of the forces P, and  $\Sigma$  = sum, and  $S$  = stress in the chain.

Fig. 10 represents a section similar to that of Salisbury Cathedral, which the author has included in this paper to show the application of theory to the vaults, and the influence of the oblique thrusts on the side walls. The curve of equilibrium due to the weight of the arch alone is shown on the right-hand side of the figure, and might be considered by many as decidedly unstable, as the curve passes outside the intrados of the arch; but before the question as to its stability is decided, the influence of the walls above the springing must be considered.

In diagram 1 of fig. 10 we have the elements shown from which the curve above alluded to has been drawn.

In a very able paper read at the Institution of Civil Engineers, entitled "The Stability of Vauissor Arches," by Mr. Henry A. Cutler, Assoc. M. Inst. C.E., special attention was called to this influence, and an original method of calculating its effect given. This method being easily understood may be applied to the example now under consideration.

The curve of equilibrium approaching the intrados between the crown and springing, the arch would be thrust outward, but the wall between F and G would, if heavy enough, prevent

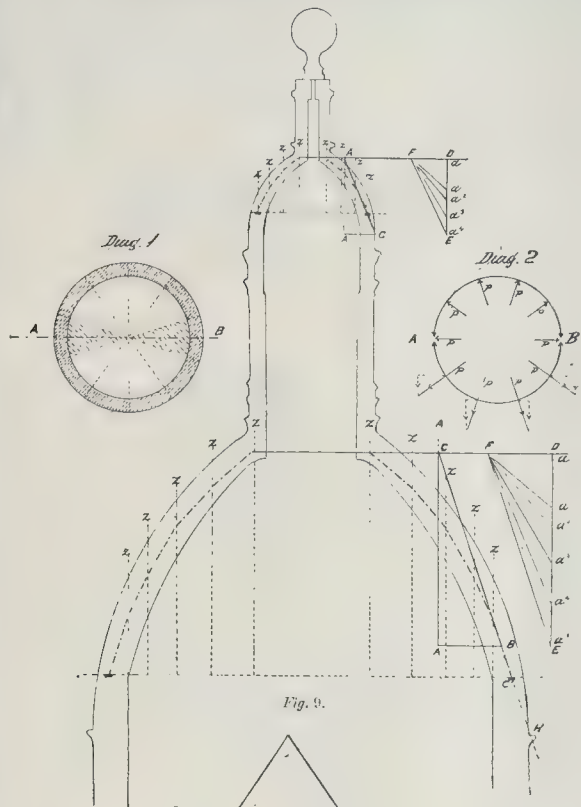


Fig. 9.

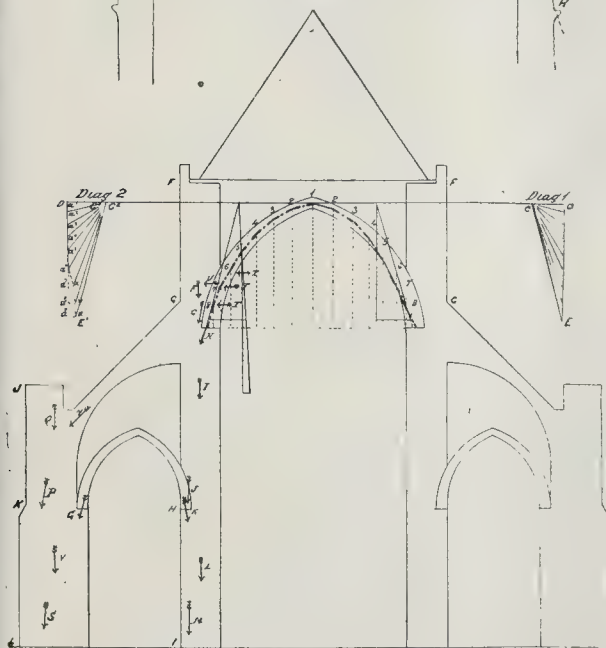


Fig. 10.

external forces, lines  $a^1$ ,  $a^2$ , &c., parallel and equal to the external forces  $x$ , &c., should exactly join up between J and K when drawn in the diagram; if they fail to do so some mistake has been made either in calculating  $x$ , &c. A dome is essentially an architectural struc-

A dome is essentially an architectural struc-

such outward movement and modify the curve to a considerable extent.

It will be seen that only the points 6, 7, and 8 will come into contact with the wall, so that above those points the loads on the arch will be unchanged. To ascertain whether the wall F G will make the arch unstable or not, it is best to modify the curve, and ascertain first what forces are required to balance it.

At point 5, upon the right-hand side of the diagram, the curve is too close to the intrados, but as the weights 1, 2, 3, 4, and 5 are definite and unalterable, the only way of altering the curve down to this point is to alter the horizontal thrust in the diagram that is, to extend the line D C to an amount which cannot be ascertained definitely at first, but must be arrived at tentatively.

The extra thrust occasioned by this alteration will be supplied by the wall F G at points 6, 7, and 8.

It may appear arbitrary to suppose that the wall will exert the required pressure to make the curve of equilibrium fall within its proper limit; but, as noticed, the arch will be thrust out by the curve falling below the intrados, until it is brought to rest by the reaction of the wall F G behind it, and its reactive force (supposing the wall to be strong enough) restores equilibrium in the arch, thereby keeping the curve of equilibrium within proper limits.

Until the effect of the wall has been calculated, it can be only a supposition that the wall will be strong enough for this purpose, but this will be determined when the proper curve has been selected.

As a trial, the point C' in diagram 2 (fig. 10), corresponding with C in diagram 1 (fig. 10), may be moved to C', the same load-line D' E' being used as for diagram 1. The curve, as far as load 5, shown on the left-hand side of the arch, is the result, and this being seen to be so far sufficiently within the limits, the remaining portion of the curve between 5 and the springing is then assumed, and drawn so as to be within the limits and the lines  $a^1, a^2, &c.$ , in the diagram drawn parallel to the lines in the curve, a method exactly opposite to the ordinary plan of procedure. From points  $a^1, a^2, a^3$  horizontal lines were drawn until they cut the vector lines from C' in points  $x, y, z$ , and then lines connecting these points gave the directions and amounts of the forces required to balance the curve.

By the construction of the diagram, lines  $a^1, a^2, &c.$ , representing the vertical loads, become the vertical components of the oblique forces required, therefore the horizontal components are the extra forces required to obtain the modified curve or the thrust the arch exerts against the wall.

In fig. 10 these forces are indicated by the horizontal arrows T T T, and the resultant of the three, which is obtained by taking moments round the springing, is shown by the arrow marked U.

The weight of the wall F G acts at its centre of gravity F, and from the point of intersection of this line with U (the resultant of the horizontal pressures at 6, 7, and 8), the weight of the wall F G is plotted vertically downwards, and from the point so found an amount equal to the horizontal resultant U is set off; then a line connecting the two points so found is the resultant pressure on the bed-joint at G. This resultant is well within the limit of the middle third of the wall; therefore the whole structure is perfectly stable above the point considered.

The horizontal thrust at the springing is equal to D' C', the portion C' C' = U, being already provided for. The wall being assisted to resist the thrust of the arch by the flying buttresses, as a preliminary step some assumption must be made for the amount of thrust supported by it. The author has assumed that half the thrust is taken by the buttress and half by the wall of the building; this assumption brings the resultant pressures within reasonable limits, and is therefore not far from the truth. On finishing the calculation, had either of the resultants in the buttresses approached dangerously close to the face while the resultants in the wall were well inside, it would have been evident that half the thrust of the arch (assumed to act on the abutments) was too much, and a smaller portion would have had to be taken.

In a badly-designed structure it might be impossible to make the resultant in the buttress and also in the walls fall within the middle third, thus involving a necessary increase in the stability of the structure.

It being ascertained that the structure is stable down to point G, the portion between G and H is next considered, as at point H the thrust from the vault of the side aisle must be taken into account. At this point we have three forces acting (neglecting for the present the thrust from the side vault), the resultant at G, the thrust H from the main vault, and the weight of the wall between G and H acting at its centre of gravity, I; the direction and position of the resultant of these forces is shown at J.

Next considering the wall between H and I at the base, we have three forces acting on the bed-joint at I, the resultant J from the upper wall, the thrust K from the side vault, and the weight of the wall H I acting at its centre of gravity L; the direction and position of the resultant of these forces is shown at M.

It will be noticed that all the resultants indicated by the arrows are, if not within the limit of the middle third, very near to it, so that stability is insured if the buttresses are able to resist the assumed half-thrust of the main arch together with the thrust of the side arch.

Assuming the half-horizontal thrust from the arch to be conveyed through the centre of the wall in an oblique direction, parallel to the coping, its direction and position will be indicated by N (see fig. 10).

Considering the pressures on a joint at K upon the left-hand side of the buttress, we have the resultant N, the weight of the wall J K acting at its centre of gravity O, and the resultant of the two forces indicated by P. The pressures acting at the lower joint L are P the resultant from the upper wall Q, the thrust from the arch and the weight of the wall K L acting at its centre of gravity V; the resultant of these forces is indicated by S. It will be seen that the resultants in the buttresses are well within the wall, and the whole of the structure stable; therefore the first case of failing stated at the beginning of this paper will not here exist.

The second cause, the crushing of the stones, need not be inquired into, but the third cause of failure, the sliding of the stones at the bed-joints, might exist, although in the case under consideration it does not. The angle of friction that is, the limiting angle at which a pressure might be applied to a stone without its sliding on the stone beneath—varies from 31 deg. to 35 deg. with the normal to the joint, and if either of the resultants makes a greater angle with the normal there would be a danger of the stones sliding. The coefficient of friction is the tangent of the angle of friction, and for masonry is known to have a value of from  $\frac{1}{6}$  to  $\frac{1}{7}$ . In some text-books we are furnished with the angles, and in others with the coefficients, but it is a matter of indifference whether we have the angle of friction or the coefficient for any particular material, as we can, when we know the meaning of the terms, derive one from the other.

[Some notes of the discussion which followed will be found under another heading.]

#### OBITUARY.

Mr. Pearson Barry Hayward, Architect, Exeter.—On the 15th inst. the remains of this well-known architect were interred in the Exeter Cemetery. Mr. Hayward was born on November 1, 1838, and was the son of Mr. John Hayward, of Exeter, the senior architect in the West of England. For many years they practised together, under the style of Hayward & Son, but latterly Mr. Tait, of London, has joined partnership, and the firm is at present known as Hayward, Son, & Tait. After serving his articles Mr. Hayward was for some time with Messrs. Hadfield, Weightman, & Goldie, of Sheffield (now Hadfield & Son), and returning to Exeter, built, in conjunction with his father, the Albert Memorial Museum, in Queen-street. He was also for many years Commanding Officer of the Exeter Company of the 1st Gloucester Volunteer Engineers; was Honorary Secretary of the local School of Art; and Curator of the Devonshire Diocesan Architectural Society. Amongst the many works Messrs. Hayward & Son have carried out, may be mentioned the Church of St. Michael, at Beer; the new Blundell's School at Tiverton; the High School for Girls, and the Diocesan Training College in Exeter. Mr. P. B. Hayward, senior, is a nephew of the late Sir Charles Barry, and he is also, we are told, a connection of Mr. J. L. Pearson, R.A.

Mr. Samuel Harpur.—The death is announced of Mr. Samuel Harpur, of Merthyr Tydfil. The deceased occupied the position of Surveyor to the Borough of Derby from 1841 to 1857. In the latter year he resigned, and entered into partnership with the late Mr. Tomlinson, of Allestree, and his brother, the firm being styled Tomlinson, Harpur, & Harpur, contractors. According to the *Derbyshire Advertiser*, they carried out a number of important water and sewage schemes at Ashby-de-la-Zouch, Burslem, Knighton, Coventry, and other places. In 1859 he removed to Merthyr Tydfil, where he completed some large water and sewage works. He was then appointed Surveyor and Engineer to the Merthyr Tydfil Local Board, which position he retained until about three years ago, when failing health necessitated his retirement, although his services were retained by the Merthyr and Aberdare Board of Health as engineer to their joint sewage farms and works. His youngest surviving son, Mr. Wm. Harpur, is Borough Surveyor and Engineer to the Cardiff Corporation.

#### Illustrations.

##### DESIGN FOR A FIREPLACE.

THIS is designed for a room in a private dwelling to be called "St. George's Hall," and the fireplace represents on the cresting St. George and the Princess and maidens of Egypt. Below, in the centre panel, is the legend of St. George. In the sides, St. Andrew, St. Patrick, St. David, St. Denis, St. Antony, St. James,—the traditionary seven champions.

The six figures under niches are the Virtues, the winged Genii, or good thoughts, the mounted Knights, Knight-errants.

The inscriptions are,—“St. George for Merry England”; the “whole armour” of the Scriptures (which were the virtues typified by the consecrated armour of Knights in the Middle Ages); and the famous “Honi soit” of the Knightly Order of St. George (the Garter).

On the marble portion are the nine worthies, David, Joshua, Judas Maccabaeus, Hector, Alexander, Julius Caesar, Charlemagne, Arthur, King of Britain, Godfrey de Bouillon. The figures on the flanks are sentries.

The hood over the fire represents the triumph of Constantine.

There are two ingle seats lighted by small windows, and by metal chandeliers at night.

J. H. POLLEN.

##### DECORATION FOR A DRAWING-ROOM.

THE drawing-room of which we give the ceiling and side forms part of an addition to a country mansion, the billiard-room, of which we hope to give an illustration hereafter, occupying the remainder of the ground-floor.

The woodwork of the dado, doors, and windows is of Australian black wood. The twelve plasterers are of pale mahogany, with panels of satinwood, inlaid with ivory and bone.

The capitals in the room are carved in mahogany, while those to the bay windows are of bronze; the pedestals of the plasterers have ornamental bronze panels, the frieze of the folding doors is of black wood, carved with dragons and the apples of the Hesperides, and has in the centre shield a marble jewel. The face of the archivolts of the recesses and their soffits are carved in mahogany, and the spandrels are painted with figures on a gold ground. The door plates and handles are of copper, inlaid with pale brass in scroll work; beyond the carpet the floor is of inlaid parquetry in scroll work of pale satinwood on a black ground, with walnut edges and white lines, and the room is hung with damask satin of pale apricot on a copper-coloured ground.

The ceiling, cornices, and soffits are plaster in relief, with figure panels of the Winds, Seasons, &c.

The bronze work was executed by Mr. A. Gilbert, A.R.A., from Mr. George Aitchison's design.

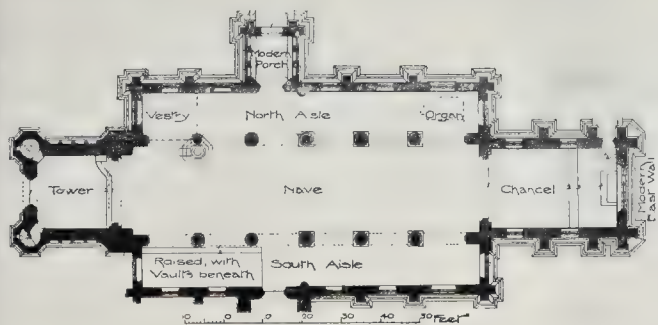
The figures of the Winds and Seasons, and the white marble chimney-piece and bas-relief over it, are by Mr. S. Peyps Cockerell.

##### DESIGN FOR A RAILWAY STATION.

THIS design, by Mr. W. H. Boney, was made in competition for a Royal Academy prize, and we commented on it, with others, at the time the students' designs were exhibited.

The design was not successful in the students'





Elm Church, Cambridgeshire.—Plan.

competition, but the Academy thought it worth a good place in the Architectural Room at this year's exhibition.

#### ELM CHURCH, CAMBRIDGESHIRE.

THIS church, which is dedicated to "All Saints," is situated in a village of the same name, about two miles from Wisbech. It is mainly of Early English work, though there are many evidences of insertions of later date, as the Decorated and Perpendicular windows in the north and south aisles testify. Although hardly so rich in detail as many of the neighbouring Marshland churches, it has some interesting features worthy of study, more especially the fine tower, nave arcading and clearstory, with its rich roof, and the north and south entrances. The plan is very simple, and seems to have been little altered from the original. The tower is at the west extremity of the church, and forms the principal entrance, leading to the nave, with its north and south aisles and chancel. There is no vestry, nor are there traces of a past one. At present the west bay of the north aisle is partitioned off and used as a vestry. The nave, of six bays, with a fine clearstory, is simple Early English work, the columns being alternately circular and octagonal. The chancel and tower arches are also of work of the same period. The nave roof is Perpendicular, of double hammer beam construction, and is very rich in carved and moulded work, much of which has fallen into decay. The north aisle has also a good, although simple, roof. The chancel has been much "restored," the east wall having been rebuilt, with a new Decorated window inserted; while a new roof has replaced the old one. The Decorated windows in the north and south walls are parts of the old work. The priests' door in the extreme north-east corner of the chancel is also an interesting feature. The tower is a very simple but bold example of Early English work. The richly-moulded north and south doorways are also worthy of note. The masonry generally is in excellent condition, especially that of the tower, clearstory windows, north and south doorways. The stone used is from the quarries of Barnack, in Northamptonshire, the same as used for Ely and Peterborough Cathedrals.

SIDNEY K. GREENSLADE.

\*\* We may add that the drawings here published obtained for their author the Neale Prize, presented by the Architectural Association for measured drawings drawn on the spot.

**Association of Municipal and Sanitary Engineers and Surveyors.**—The following gentlemen having satisfied the examiners at the examination held in London on the 26th and 27th October, have been granted certificates of competency by the Council of the Association:—R. B. Brown, Bridlington Quay; W. G. Bryning, Liverpool; W. C. Field, Eastbourne; J. T. Hawkins, Chichester; J. S. Millington, Wavertree; J. B. Wilson, Cookermouth. The next examination will be held in London in April, 1889.

**The Annual Report of the Local Government Board.**—We are compelled by want of space to hold over until next week our customary review of the annual report of the Local Government Board.

#### THE ARCHITECTURAL ASSOCIATION.

THE third meeting of this Association for the present session was held on the 16th inst., in the meeting room of the Royal Institute of British Architects, Mr. Herbert D. Appleton (President) in the chair.

The Hon. Librarian announced several donations to the library, one being a very valuable folio volume, "The Abbey of St. Andrew, Hexham," presented by the author, Mr. Charles Clement Hodges. Votes of thanks were accorded to the different donors.

Mr. T. E. Pryce (Hon. Sec.) stated that Mr. Millard had kindly undertaken to conduct the Elementary Class of Water Colours. He would be glad if members who wished to join that class, or the senior class, would send in their names as soon as possible.

Mr. C. H. Brodie said that at a meeting held for the purpose, a social club, with the title of the "A. A. Lyric Club," had been started for members of the Association. A committee had been appointed, with Mr. Appleton as President, and Messrs. Julian and Miller as Vice-Presidents. The object of the club, as stated in the rules, was "to promote friendly intercourse between the members of the Association," and one of the means would be the holding of a series of smoking concerts, the first of which would take place at Anderton's Hotel, Fleet-street, on the 8th prox. It was proposed to hold two meetings monthly, on the first and third Thursdays, the session of the club to be concurrent with that of the Association. The subscription would be 5s., and after a certain number of members had been elected, a small entrance-fee would be charged. The club had the sympathy of, and would work in co-operation with, the Entertainments Committee.

Mr. A. T. Walmisley, M.Inst.C.E., then read a paper on "The Theory of Arched Structures," which, with the numerous diagrams illustrating it, we print in other of our columns.

The Chairman said the paper was one that hardly admitted of discussion, and they could only sit at the feet of Gamaliel, and learn of him (applause). The subject had been most admirably explained, and first of all the benefit of the diagrams when they had the letterpress, they would be able to study them quietly by themselves. It might be difficult, in a great many instances, to follow this graphic method of calculating strengths if one was not accustomed to it, but Mr. Walmisley was to be congratulated on the extreme clearness of his expositions (applause). The subject ought to be one of great interest to architects, and he was in hopes that this mode of calculating thrusts and weights was growing in favour with them. Up to a comparatively recent time they had been in the habit of doing things too much by rule-of-thumb. If, therefore, they could give a reason for the faith that was in them, it was advisable they should do so.

Mr. H. Lovegrove, in moving a vote of thanks to Mr. Walmisley, remarked that this was a topic in connexion with which no burning question of partisanship for styles could be introduced. They were brought face to face with very difficult problems, and the diagrams would have to be thought over, as it was quite impossible for one to rise at a moment's notice and follow the lecturer through all his explanations; but if they could by

any means see those diagrams, and ponder over them, they would learn very much which would be to their profit. He was very glad that Mr. Walmisley had referred to the part played by the chain round the dome, because he (the speaker) had recently had to consider the construction of a dome, and he was a little bit at sea as to the exact part played by the chain. He, of course, knew about it generally, but he had wished to know more particularly, and that information he had now received. He had often wondered how much their ancestors in the Middle Ages knew of these theories, when constructing their extraordinary groining, and he had sometimes fancied that they knew little about the theory, but put their work together with ample strength. Taking the roofs of the Middle Ages, they would be found, on critical examination, to be composed of massive timbers put together, and kept in place by the enormous thickness of the walls and buttresses. The Medieval construction was not so scientific as that of some of the modern roofs, and Mr. Walmisley seemed to indicate that flying buttresses were almost necessary for groining of the kind shown, to divide the stress, as it were.

Mr. Percy Hunter seconded the vote of thanks. In listening to the paper, the same question referred to by Mr. Lovegrove had arisen in his mind, viz., as to whether the old builders ever worried themselves about all those strains and stresses so graphically represented that evening; and he believed, for the happiness of all present, they might arrive at the safe conclusion that the old men did nothing of the kind. He said for their "happiness," because if architects had to sit down to their drawing-boards and T-squares to work out all that sort of thing graphically before they could design a cathedral, they would throw up the work in despair. At the same time, as the President had said, they wished to give a reason for the faith that was in them, therefore they were glad that, owing to the advance of science and the careful attention given to those matters by Professor Rankine and others, men like Mr. Walmisley were to be found to whom they could safely go for advice and assistance in any question of really difficult construction. The author himself had given them some hopes of an escape from their difficulties in the designing of a beautiful building only by means of scientific construction, because he had admitted that Professor Rankine started first of all with some arbitrary assumptions. The Professor took the stability of existing buildings, and working from that deduced his wonderful method of arriving at results. He was very thankful after all that Professor Rankine had gone to the old examples, before he could arrive at his scientific results. They might compare it, in a certain degree, to the Grecian statuary. It was very doubtful if the Greeks had such a knowledge of anatomy as was possessed now-a-days by many of the students of the Royal Academy, yet they turned out beautiful statues. The old builders, too, had great ideas of beautiful buildings; but they could not have shown reason for the faith that was in them, and they therefore built from experience. That it was so, he presumed might be taken from the history of the buildings themselves, and from the way in which they had evidently dealt with different parts of their construction at a time, getting over the difficulties as best they could, by putting on something here, or taking off something there, and diverting their loads. In the section of the dome [see fig. 9 on p. 377], Mr. Walmisley had taken a two-centred arch, and he arrived at the thrust at the point C, which was counteracted by the chain. He supposed that Sir Christopher Wren would be quoted as the architect who set that example; but he would like to know whether, supposing it were a semi-circular dome, there would be any outward thrust. He had heard it doubted whether there was any thrust with a dome at all if it was truly constructed. Some time ago he heard a paper read by Mr. Chisholm, then architect to the Gaekwar of Baroda, which did not deal so much with the scientific construction of the dome as with the method in which it was built up with an absence of anything like centering. After the meeting he had a discussion with Mr. Chisholm upon the question of domes, and he found there was a great divergence of opinion as to whether there was any outward thrust at all with a truly-constructed dome. Mr. Walmisley had undoubtedly shown one thrust, and which certainly would appear to exist. To show how much engineers had worked by rule-of-



thumb, he would like to quote a well-known story of Mr. Brunel. An arch fell down during the construction of the Great Western Railway. Meeting the Board of Directors, who were in a great state of alarm and annoyance at the heavy loss, Mr. Brunel said, "I am very glad of it." The directors inquired why, when Mr. Brunel replied,—"We were going to build twenty other arches exactly like this, but now we find we have made a mistake, and we shall have to alter them." It, therefore, would seem that all this arch-building had been done very much upon a rule-of-thumb principle. It had been a matter of experience; and while he was rather delighted to find this graphic method of representing on paper, and arriving at something approximating to truth, he still felt very sceptical about accepting it as final, because there were many influences which might happen to altogether upset the calculations. The weight might happen to get imposed in a certain way during the work, and by settlement or some other cause the whole thing would be altered. So that while he would like to have this method of arriving at the result scientifically, he would still venture humbly to enter a protest against accepting it as final,—the more so as Mr. Walmisley had stated that he first of all started from an empirical rule founded upon the experience of others.

Mr. A. O. Collard supported the motion, and expressed his admiration for Mr. Walmisley's paper.

Mr. Sydney B. Beale said he rose, not with the expectation of adding much that was new to the theories brought forward that evening, but to draw attention to the methods adopted in some of the diagrams exhibited for arriving at the curve of strain in an arch under given conditions of loading. It would be seen that in each case a funicular polygon had been constructed, outside and distinct from the drawing of the arch or vault itself. The curve of strain had been derived therefrom, and finally drawn upon the arch voussoirs. This method was much more simple, less laborious, and infinitely better in many ways than a certain method adopted by the majority of writers on the graphic delineation of forces. He referred to the system of constructing the curve of strain in an arch ring, by drawing a series of parallel-ograms, one for each voussoir,—the vertical loads, acting through their centres of gravity, being resolved, together with the thrust from the crown of the arch, into a resultant that had to be similarly combined with the weight on the next voussoir, and again resolved, the whole resulting in an indescribable mass of lines, representing bed-joints, weights, thrusts, resultants, curves of pressure, and curves of resistance, radiating in all directions, much to the confusion of the investigator. The simplicity and clearness of the diagrams before them forcibly showed what an advantage the use of the funicular polygon had over the other method of many parallel-ograms in the determination of the curve of strain in an arch ring. Mr. Walmisley had described his inquiry into the stability of the nave-arching of Salisbury Cathedral. One half of his diagram (fig. 10, p. 377) indicated the curve of strain arrived at upon one series of calculations, and it was seen approaching dangerously near the intrados of the arch, and, in fact, intersecting it. That arch, undoubtedly, would contain an element of danger, were it not for the great assistance received from the weight of the superimposed nave-wall, carried up above the springing of the vault. Backing up the haunches of an arch aided very considerably to the stability of the structure. That fact might be interestingly demonstrated by using a small wooden model of an arch ring constructed with hinged or flexible joints. Upon the application of an undue pressure on the model, whether in a vertical or oblique direction, the arch would collapse; but if the haunches of the model arch were pressed upon simply by the hands, the model, under a large accession of pressure, even applied at the most disadvantageous point, would remain perfectly rigid, without any indication of failure. It then was due to the backing-up of the haunches of the nave-arching of Salisbury Cathedral by the weight of the upper portion of the nave-wall that that fine old edifice had remained in a condition of stability to the present day (applause).

After some remarks from Messrs. Owen Fleming, W. Randolph, and H. Lancaster, The Chairman having incidentally expressed a doubt whether the vaulting of King's College Chapel, Cambridge, could have been put up by people who had no correct knowledge of

the thrusts in such an elaborate piece of work.

The vote of thanks was then put to the meeting, and met with a very hearty reception.

Mr. Walmisley, in replying, said that several remarks had been made as to the amount of scientific knowledge possessed by the old architects. Perhaps they had depended a good deal upon experiment, as in the case of the New-street Station roof at Birmingham. In that case a load was laid on at various points, to ascertain whether it would bear the strain; but now they could calculate the strains, and, if the material and the construction were proper, they could prove the results of the calculations, specifications, and drawings. The diagram taken from a book which illustrated the edifice, and his object was to show the effect of the wall and the buttresses in sustaining the thrust, and the effect of the wall on the curve of equilibrium. With reference to the dome question, whether there was a horizontal thrust or not depended on the vertical loads of the curve of equilibrium. It was possible to construct an arch which should be too heavily loaded at the haunches, or at the groining. The superstructure above the dome had to be considered. The curve of equilibrium had to be drawn, and it was necessary to see that the weights were such that though there might be little horizontal thrust, there might be the chance of the arch coming out between the groining and the springing, which depended greatly on the weights they had to deal with and the rise they gave to the arch. One gentleman thought there was no tension unless the line of pressure fell without the wall. He thought he had sufficiently explained that by the illustration of the plank and the statement quoted from Professor Rankine.

The proceedings then terminated.

#### THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

MISS HARRISON'S third lecture at the South Kensington Museum, on November 16, had for its subject the theatre of Dionysos at Athens. This theatre has been excavated since 1862, so that it would scarcely fall within the scope of these lectures were it not for the recent discovery of the ancient circular orchestra or dancing-place, and for the mythological importance of its sculptures in regard to the cults. Close to the theatre were the two temples of Dionysos mentioned by Pausanias (i. 20). The foundations of the oldest (*τὸ ἀρχαῖον*) almost adjoins the stage—one proof that Greek dramatic performances were not a mere amusement, but had a sacred character. The theatre can best be studied under the three headings of the *theatron* proper, the stages, and the orchestra. The first was composed of semicircular rows of seats, rising one behind the other; only the places of honour were separate chairs, but the stone benches were distinctly marked off into divisions, so that each spectator had his allotted space. The chairs were set apart for the priests. The most beautiful of these exactly faces the stage; it belonged to the priest of Dionysos, and is inscribed *ἱερεὺς Διονυσίου Εὐαγέρτου*. Another, of which the inscription was given in the last lecture, belonged to the priest of Hekete and the Charites. On a third we read *ἱερεὺς Ἀνέκων* | *καὶ ἱπποῦς* | *Εὐρυκλίου*—a hero known to us from this inscription only.

Turning to the stage, or *skene*, we find that there were several stages built at various dates. The latest, constructed by the architect Phaidros under Septimius Severus, is supported by coarse figures of Sileni, alternating with reliefs representing the life of Dionysos. Poor though these sculptures be, they have great mythological interest; they give us the birth of the god, his reception by Ikaros on his first entrance into Attika, &c. This myth of the journey of Dionysos means, of course, that the vine was not indigenous to the soil of Attika, but imported. The deme *Ikaría*, where the god first stopped on his journey, has within the last year been identified with Dionuso, to the north-east of Pentelikos, a beautiful spot, where the Dionysiac ivy still abounds, and where the numerous goats seem ready for sacrifice to the god.

When we come to consider the orchestra, we find that the several stages encroached on it to such an extent that its original circular shape was destroyed. The real gist of the orchestra is best understood from the plan of the theatre at Epidaurus, excavated 1881-3. It shows the

perfectly round orchestra, the wide *parados* leading to it on either side, and the small stage. Miss Harrison holds that not only the chorus appeared on the orchestra, but that the greater part of the action took place there. She graphically showed the gain that this would be in such a play, for instance, as the "Agamemnon." The chariot bearing *Agamemnon* and *Kassandra*, and the whole train of captives, would come sweeping down the *parados* on to the orchestra; a great sense of space and freedom was thus gained, and the difficulties arising from the want of room, were such crowded action represented on the *skene* above, avoided. The *skene*, then, was of comparatively little importance in the early Greek theatre, and was used probably only when it was necessary to emphasise the fact that an actor appeared from *within* the palace or house, e.g., in the case of the "Agamemnon," *Kytemnestra* issuing from the royal palace would appear on the *skene*. Later the old pro-Lycurgic orchestra or dancing-place of polygonal masonry has been discovered in the theatre of Dionysos. It was the earliest and only permanent portion of the theatre in the days before the wooden seats had given place to the more substantial stone ones.

In the centre of the orchestra was the altar on which the goat was sacrificed, and round which the chorus danced. The whole drama arose in time out of the simple sacrifice and dance in honour of Dionysos. The earliest representation of such a dance is the archaic *choros* at Olympia,—seven quaint figures linked together for a round dance. The *choros* was not in honour of Dionysos alone. A fine vase (Corneto) shows a round dance disposed as a border around the contest of Herakles and Triton. In its special connexion with Dionysos, two new mythological elements came in,—the Satyrs and the Maenads. The beautiful clyx, by Hieron (Berlin), shows the Maenads dancing in honour of Dionysos *Dendrites*. An aryballos from Attika (Berlin) shows them reclining in every picturesque attitude of exhaustion after the dance. The riotous element of the Bacchic dances was intensified by their connexion with the rites of Kybele,—a connexion well proved by the first chorus of the *Bacchæ* of Euripides, and by a terra-cotta from Megale (St. Petersburg), showing Kybele in a shrine, surrounded by a frieze of Maenads. These illustrations are only the mythical counterpart of what actually took place. The great *Kroter* at Naples brings visibly before us the whole scene of the preparation for the chorus,—actors with their masks ready to put on, figures hurrying to and fro; in fact, all the scene of bustle which precedes a performance. The Dionysiac Theatre itself was adorned with dancing figures; two of extreme beauty,—one of a figure in calm movement, the other showing a Bacchante in excited motion,—are now in the Central Museum at Athens.

#### ARTS AND CRAFTS EXHIBITION SOCIETY. TYPE-FOUNDING AND PRINTING.

In type-founding and printing, Mr. Emery Walker, who delivered his lecture on the 15th inst., was furnished with one of the most interesting subjects which could fall to the lot of a lecturer—one which affords ample material for picturesque treatment—and appeals to every class of hearer; for who ever tires of hearing about books? But it was too large a subject for a single lecture, and to do it the barest justice was in the circumstances a hopeless task.

The much-debated point of the inventor of printing was ingeniously disposed of, the lecturer remarking that the inventor of movable types was the real inventor of printing. He might have told his audience that there were grounds for believing that the Chinese (who were represented at the lecture) used movable clay types so early as the eleventh century,—and that in the British Museum are certain Chinese books so printed, and dated 1337. Our Norman Kings used what was in effect a movable type in the block with which they impressed their initials, and the wonder is how so obvious an advance as the multiplication of single letter blocks should have been so long delayed. But all great inventions are simple, like the conjuror's tricks when explained; and it was not until the prisoner had been for sixteen years in his dungeon that a happy thought struck him (*pace* Artemus Ward), and he opened the window and got out!

The first use of movable metal types, though often credited to Gutenberg, has been traced with reasonable certainty to Coster, of Haarlem,



in the year 1445, and the earliest extant example of their use is believed to be a Letter of Indulgence by Pope Nicholas V., dated 1454. The first types were facsimiles of the handwriting of the time, and they not only closely followed the shapes of the letters, but also the unevenness of the written lines. The printers were uneducated men, and copied with dull precision the MS. before them,—mistakes, erasures, and all. Improvement in the printers' art was very slow. Catchwords at the bottoms of the pages were introduced in 1469, pagination in 1471. Vellum gave place to paper in the same year, and in 1473 the lines were straightened by mechanical means, and the general appearance of the printed page became something like what it is now.

The lecturer rapidly explained the cutting of the steel letter-punches, the formation of the matrix, the casting of the type therefrom, the compositors' cases, and general arrangements of a modern printing office.

By the assistance of the oxyhydrogen light he threw upon a screen enlarged facsimiles of some early MS. and printed sheets in chronological sequence, and dwelt upon their points of difference and excellence with minute knowledge of the subject and the unctious of an enthusiast.

Passing to the subject of book illustration, he insisted on the necessity for making the dot subservient to the text, and was very severe upon the modern practice of deranging the text in order to print a block of fanciful outline. In criticising the modern style of woodcutting and the use of toned pictures, he should have called to mind some notable exceptions—to wit, the early woodcuts of Sir John Millais and others; and the presence of Mr. Walter Crane might have reminded him of the charming illustrations to Mrs. Molesworth's tales which that accomplished and versatile artist has supplied, and which fulfil every requirement of the wood-cutter and printer.

The lecturer had much to say as to the superior beauty of the older type, and commended the *Pall-Mall Gazette* and other papers for returning to the earlier fashion. He explained the reason for printing the text so as to leave a wider margin at the bottom and right-hand side, as they suffer most in wear, and altogether favoured the arrangement of title-page, &c., &c., which the sixteenth-century Italian and Flemish printers used.

The President having announced that book-binding would form the subject of the next address, the company spread about the galleries, which were thrown open for their enjoyment.

#### THE IMPERIAL LAW COURTS AT LEIPZIG.

THE highest Appellate Court of the German Empire is not, as so many other things are, at Berlin, but at Leipzig, and the stress of business rendering larger buildings absolutely necessary, a competition,—public, but limited to German architects only,—was called for in the spring of 1885, with the result that the first premium was awarded to the Darmstadt Court architect, Prof. Ludwig Hoffmann. His design was recommended for adoption subject to certain alterations, and these having been made to the satisfaction of the law officers of the Crown, the whole scheme was finally referred to the "Architectural Academy of Saxony" for approval. This having been obtained, Prof. Hoffmann was asked to prepare an estimate of the cost. Early in 1886 this estimate was ready, and amounted to 322,750*l.*, which, by successive curtailments in ornamentation and so forth, was finally reduced to 295,100*l.* The preparation of the details occupied the following year and part of this, and on October 31 the foundation stone of this important building was laid by the Emperor in the presence of the King of Saxony and a large legal and (of course) military gathering, the architect having the honour of personally explaining the plans to his Majesty at the close of the ceremony. The works are now in progress, but it is calculated that the carcass alone will take two years, and the joinery, internal fittings, and the lighting and heating arrangements will take four years more. A large model is now being prepared to show certain external alterations contemplated by the architect, and as soon as this is completed we hope to refer to this subject again, and to publish the plans obligingly promised to us by their author. In the meantime, we may add that the building stands, as such buildings

should, entirely free on all sides, and that the general design consists of a rectangular plan of about two to one, with two large open courts formed by a cross-range from back to front. The elevation is in palatial Italian Renaissance, and consists of two storeys, the lower one low, with rustications and square openings, the upper one high, with round-headed windows, &c. The centre of the principal façade is broken by a slight but broad projection, with cupolas at the angles, and further central projection containing a grand entrance-archway. The central feature upwards is the large dome of the Great Hall, which is placed in the cross-range above mentioned, and, although naturally at some distance behind the line of frontage, it will not only be high enough to dominate the entire group, but will form a conspicuous object in the City of Booksellers.

#### ARCHITECTURAL SOCIETIES.

*Birmingham Architectural Association.*—At a meeting of this Association, held on Tuesday evening last, Mr. Herbert D. Appleton, F.R.I.B.A., President of the (London) Architectural Association, read a paper on "The Affiliation of Student Architectural Societies." It reached us too late for insertion this week.

*Edinburgh Architectural Association.*—At a meeting of the Edinburgh Architectural Association, held on the 15th inst., in the Architectural Hall, 42, George-street—Professor Baldwin Brown, president, in the chair—Mr. J. Crabb Watt delivered a lecture on "The Aesthetics of City Buildings." Selecting Edinburgh as a type to which the abstract principles, discussed in his previous lecture, might be applied, he proceeded to refer first to the burghal and then to the urban architecture. Under the first branch, he touched incidentally upon the recent Municipal Buildings scheme. With the exception of the site of the Bank of Scotland, the proposed situation he thought was the finest almost in Europe for such a purpose with respect to the base, elevations, and sky-lines. At the same time, his impression was that no buildings which did not exceed at least 200,000*l.* could ever afford satisfaction to themselves or pleasure to strangers, and certainly would not satisfy the requirements of aesthetics. In the second part of his subject he dealt at considerable length with the structure and features of the new town. At the outset he expressed regret at the evident unwillingness or obstinacy of the south side contingency of the Town Council to eradicate the source of disease and uncleanness at the base of the new town. Dealing with the beauties of the architectural style of the buildings, he spoke of George-street as being the finest street he had seen in any town,—and said he had seen many towns here and in five Continental countries. Ruskin's criticisms of Edinburgh architecture received considerable attention from the lecturer, who thought that he had gone entirely astray in the views which he had adopted. He next spoke strongly in favour of the adoption of grotesque ornamentation to a greater degree than hitherto, but gave a word of warning against perpetrating vulgarity in stone, as at Brussels. Aesthetics, he said, above all things, demanded variety of perspective and pure taste in detail; and in his opinion they had a good deal to learn in regard to their cornices and the ornamentation of their front elevation. As a practical suggestion, he thought that an æsthetic council might be established, or the constitution and power of the Dean of Guild Court enlarged.

*Leicester and Leicestershire Society of Architects.*—A large meeting of members of this society and their friends was held on Monday last, when Mr. R. Phené Spiers, F.S.A., delivered a lecture on the "Structural Origin of some forms of Mohammedan Architecture," illustrated by drawings on the black board, and by an admirable collection of drawings and photographs. A vote of thanks, proposed by Mr. Jackson, seconded by Mr. Paget, and endorsed by the Chairman, Mr. Tait, was carried by acclamation.

*Manchester Architectural Association.*—The last ordinary meeting of this Association was held at the Diocesan Buildings on the 20th inst., Mr. A. H. Davies Colley, A.R.I.B.A., President, in the chair. Mr. J. Corbett read a paper on "House-heating Water-fittings," in which he explained the principles necessary to insure a perfect circulation together with all necessary practical information. A discussion followed, in which Messrs. Mould, Stelfox, Hodgson, and Ward took part.

*Sheffield Society of Architects.*—At the ordinary monthly meeting of the Sheffield Society of Architects and Surveyors, last week, an interesting paper was read by Mr. E. J. Tarver, F.S.A., on "A Proposed Improvement in Theatre Planning." Mr. T. J. Flookton presided, and there was a large attendance of members and visitors, including Messrs. J. B. Mitchell-Withers, C. Hadfield (hon. sec.), J. D. Webb, W. F. Hemsoll, H. W. Lockwood, C. J. Innocent, W. C. Fenton (Buildings Inspector), J. Jackson (Chief Constable), H. Bramley, R. Cartledge, W. Maughan, and others.

#### COMPETITIONS.

*The Friar's School, Bangor.* The Governors, acting on the advice of their assessor, have adopted the design "Light and Air," by Messrs. Douglas & Fordham, of Chester. The design "Stability," by Messrs. Oliver and Leeson, was, in the opinion of the assessor, next in merit. Designs were also sent by Mr. Burgess, Mr. Bell, Messrs. Giles & Gough, and by Mr. Griereson (of Bangor). The work will be carried out by Messrs. Douglas & Fordham, the non-successful competitors receiving each the sum of 20*l.* The six names were selected by the Governors from a list of twelve named by the assessor (Mr. R. Herbert Carpenter, F.R.I.B.A.) in answer to an invitation from architects of some experience in school buildings of the class proposed to be erected at Bangor. The plans will be on exhibition for a fortnight.

*New Offices, Bute Dock, Cardiff, for Messrs. Cory Bros. & Co., Limited.*—In response to advertisements, over fifty architects from all parts of the country, competed for the work, and the two premiums offered have been respectively awarded to Mr. E. H. Bruton, of Cardiff, and Mr. E. A. Lansdowne, of Newport, Mon.

*Public Offices, New Swindon, Wilts.*—At a meeting of the Local Board, held on Tuesday, November 13, the following gentlemen were the four selected out of twenty-seven competitors:—Mr. Brightwen Einyon, of Ipswich; Messrs. Henman & Timmins, of Birmingham; Mr. J. Beale, of Westminster; and Mr. W. H. Reed, of Swindon. The final selection has now been made, allotting the first premium to Mr. Einyon, and the second to Messrs. Henman & Timmins.

#### LINE OF BUILDING FRONTAGE.

SIR,—I observe a reference in last week's *Builder* to the Report of the Royal Commission on the Metropolitan Board of Works, and to my suggestion as to the constitution of an Appeal Committee. It is there said that the "Commissioners entirely dissent from the suggestion of making the Superintending Architect a Member of the Tribunal of Appeal from his own decision."

I am sure you will oblige me by printing the actual words of the Report. The Commissioners say:—"His reasons for this suggestion will be found in his letter which is appended to our Report. We quite admit the weight of those reasons, but we think there are, on the other hand, objections to allowing the person appealed from to form part of the Tribunal of Appeal. We do not think it necessary to express any decided opinion on the point, but submit the whole matter as one deserving very serious consideration."

No doubt the objections at which the Commissioners hint will be carefully considered with my recommendation. I am, of course, quite indifferent as to the result.

THOS. BLASHILL,  
Superintending Architect of Metropolitan Buildings.

\* \* The words "entirely dissent" are, we perceive, a little too strong; but the impression left on our mind was that the Commissioners' own opinion was decidedly against the suggestion. Our objection is, of course, on general principle only, not from any opposition to Mr. Blashill in particular.

#### THE "SUGGESTIONS" AND "HINTS" RE-ISSUED BY THE INSTITUTE.

SIR,—At the "business meeting" on Monday night I think it was overlooked that this re-issue, like the "Encyclopaedia of the Antiquaries" (to quote Lord Grimthorpe), was intended, not only for members of the Institute, but for circulation among the rural deans and others of the clergy, who, with churchwardens, are more immediately responsible for the structures of our ancient churches. But



there are, as it is only too certain, some of us architects devoid of antiquarian knowledge, who sadly need the valuable advice given in these carefully-studied "Suggestions." This re-issue was, therefore, intended to remind all those concerned in the initiation and control of "restorations," that the Institute had been among the foremost in their earnest and practical advocacy of "conservation," which is now so strongly urged by the Society of Antiquaries, and by other, perhaps, less practical societies. A FELLOW OF BOTH SOCIETIES.

4, Carlton-chambers, 4, Regent-street, S. W.  
Nov. 20, 1888.

\*.\* Does our correspondent think the shoving off of the outer half of a partially-decayed mullion, and pinning a new front on to it, a very "practical" proceeding?

#### THE REVIVAL OF HANDICRAFT.

SIR.—Mr. Morris exhibits a sideboard and also a cabinet at the Arts and Crafts Exhibition, which he tells you in the catalogue are "designed by G. Jack." But the two men, Sidwell and Thatcher, who made these pieces of furniture, were not considered or mentioned at all until Mr. Crane asked for their names.

This little incident will amuse those who have heard Mr. Morris's tall talk about the place the handicraftsman is going to take when the Socialist's dream has been fulfilled. It does not appear to me necessary to wait for the revival of handicraft till we are all unselfish and industrious enough to make the fulfilment of these poetical ideas possible.

I think there can be very little doubt that it is principally the decadence of the apprenticeship system which is the cause of the degeneration of the handicraftsman, and that a return to this, coupled, of course, with a demand for artistic work, would very soon bring about a change. Mr. Morris denounces machinery, but, I would ask, cannot beautiful things be made by machinery, and is not the constant repetition of ugliness the fault of the manufacturer, who will not pay for good and fresh designs, and cannot judge them if he would, and of the buyers, who only like gaudiness and show, rather than the fault of the machine?

Mr. Morris asks people to notice "how beautiful the ordinary arts of life became in the Middle Ages," and says the reason was that the workman of that day was free. Why does not Mr. Morris free the men who do his work, and allow their names to appear, instead of their being merged in "Morris & Co."?

CHARLES F. MOXON.

#### "F.S.A."

SIR.—Will you kindly permit me to state that Mr. Brightwen Binyon, whose name appears on a design in your issue of the 17th inst., although he signs himself "F.S.A.," is not a Fellow of the Society of Antiquaries of London.

W. H. ST. JOHN HOPE.

Asst. Sec. S.A.

\*.\* Since receiving this letter we have written to Mr. Binyon for an explanation, but up to the time of going to press have not received any reply from him.

#### WARMING VILLAGE CHURCHES.

SIR.—Referring to the letter of "An Old Subscriber," asking for information on the above subject, I am pleased to give him the result of my experience.

Last year I was consulted as to the best method of warming a village church near Southampton.

I had the same difficulties as your correspondent to contend with; a chimney was objected to, no water or gas supplies available, and a furnace outside the building was to be avoided.

After great consideration, I decided to adopt the system of hot air warming, as invented by Mr. John Grundy, of 30, Duncan-terrace, City-road, London, the *modus operandi* being as follows:—Two chambers were constructed of 9 in. brickwork, under the aisle floor near the entrance door; one 4 ft. by 7 ft., and the other 8 ft. by 4 ft., both 5 ft. deep; the former being the stoking chamber and fuel-store, and the latter the air-chamber, in which Grundy's patent single apparatus was placed.

The cold air is conveyed into the heated chamber by three sets of 9 in. stoneware pipes, laid under the seats, and communicating directly with the external air, the inlets to the same being regulated with revolving slides.

The smoke-flue from the stove is of brickwork, covered with stone and concrete, and is laid in an opposite direction to the air-flues; this flue also passes under the seats for a distance of 12 ft.; when, through the external wall of the church, the flue is carried to the top of the tower (50 ft. in height), with 8 in. cast-iron pipes, which, being painted stone colour, are scarcely noticeable. After the apparatus has been lighted for a short time the smoke emitted from the flue is very little and hardly perceptible. At the bottom of the iron-pipe flue a damper is placed, by which, to a great extent, the heat of the building can be regulated.

Over the top of the leading-chamber are inserted

two cast-iron entrance flaps, with chequered surfaces, and over the air-chamber are fixed two iron gratings, through which the heated air is circulated into the building; at the same time, the apparatus draws out the cold air by means of two smaller gratings.

The spaces between the gratings and flaps are covered with brick arches on J-iron girders, and the stone paving is raised over the same.

The only indication that the apparatus is inside the building is the flap and gratings, over part of which the congregation have to walk, but not the slightest inconvenience is experienced from them.

The apparatus is very simple, the heated air not the least obnoxious, and the whole system gives entire satisfaction to all concerned.

Assoc.-M.I.C.E.

Southampton, Nov. 20, 1888.

\*.\* In reference to a previous letter on this subject, Messrs. A. M. Perkins & Son write to say that the system of small-bore pipes described as "Bacon's patent" was, in fact, the patent of A. M. Perkins, and is now the property of their firm and carried out by them.

#### ST. HILDA'S CHURCH, SUNDERLAND.

DEAR SIR.—"A Competitor," who writes you on the above subject, and whose letter appears in the last issue of your paper, is evidently a very superficial reader of the professional journals, for if he will refer to the issue of the *Builder* of Oct. 19, he will find the result of the above competition therein declared.

ANOTHER COMPETITOR.

#### COMPETITION FOR HOTEL AT DOUGLAS.

SIR.—In the *Builder* for Nov. 26, 1887, an advertisement appeared asking designs in competition for an hotel and boarding-house at Douglas (Isle of Man), and offering 25*l.* premium for the best design. This was issued by a Mr. Louis Kelly, a builder, of Douglas. In the particulars issued to intending competitors, it was stated that a professional assessor would be appointed.

I sent in a design in December, 1887, and not hearing anything concerning the matter, recently sent a request to Mr. Kelly for copy of the assessor's award, and return of my sketches if they were unsuitable. This has elicited no reply. Do any of your correspondents know anything of the business? G. J.

#### THE MANCHESTER ARCHITECTURAL ASSOCIATION.

SIR.—Allow me to correct the report of my address in your issue of the 10th inst. (p. 345). The total number of practising architects in Manchester, of whom in July last only forty-seven had signed the form sent out by the Competitions Committee of the R.I.B.A., was by a clerical error stated as 118. It should be 168,—that is, thirty out of every seven. I may add that out of two-hundred members of the Institute who should give special support to its efforts to improve the status of the profession, only nineteen had signed at that date.

A. H. DAVIES COLLEY, A.R.I.B.A.

48, King-street, Manchester, Nov. 21, 1888.

**Registration of Plumbers.**—A large public meeting of plumbers, architects, and others has been held in the Technical School, Belfast. The chairman, Mr. J. Mackenzie, said that sanitary plumbing was now regarded as one of the principal branches of technical education; and it was especially important that in a city like Belfast, with a population of 250,000, intelligent interest should be taken in the subject. Mr. F. W. Smith mentioned the steps which had been taken to form a class for the technical instruction of plumbers in co-operation with the Worshipful Company of Plumbers, London. The following, among other resolutions, was unanimously passed:—"That it is desirable steps should be taken to form a local council to co-operate with the Worshipful Company of Plumbers in support of the system of registration, as laid down in the rules of that guild." The operative plumbers at Dublin and district have also passed a resolution approving the Company's system, and a district council has been formed in that city. Ex-Provost Moncur presided at a meeting held a day or two ago at the Technical Institute, Dundee, on the occasion of the opening of Plumbers' classes there. At the monthly meeting of the Registration Committee at the Guildhall, about 750 fresh applications for registration were reported; 200 being from master plumbers and 550 from operatives. About 600 of the applications were received from the district councils acting in conjunction with the Plumbers' Company in the provinces.

## The Student's Column.

### ARTIFICIAL STONES.—XXI.

Treatment of Natural Stone Blocks, &c.

**IN** this division of the subject are grouped those devices which involve the treatment of certain natural stones, previously cut to desired shapes, so as to produce an appearance more or less resembling some more ornamental, costly, or durable stone. Several of the processes mentioned in Section 3 may also be included in this class, notably the process of Heinemann (1883, pat. 3,614), whose artificial marble is formed from gypsum, the articles cut from this stone being dried at about 212° Fahr. and then dipped in chloride of calcium solution, and then into one of hot concentrated sulphate of magnesium; the pores of the stone are thus filled with insoluble sulphate of lime and very soluble chloride of magnesium,—this latter salt must be got rid of by soaking in water; finally, the articles may be finished off with alternate applications of gelatine and of tannin.

St. Clair Massiah's patent (1850, pat. 13,218) was one of the earliest for producing on gypsum or alabaster articles an appearance resembling marble. The cut or sculptured articles were first dried at a temperature of 80° to 150° Fahr., and then immersed in a warm solution of borax with a little *sal. entrum*, after removal and careful drying. They are subsequently heated up to 250° Fahr., are allowed to cool until the hand can just be borne on their surfaces, and then immersed for a second time in a solution of hot saturated borax, to which a little strong nitric acid has been added (4 oz. to 1 oz. of acid to every gallon of solution). The articles are now left to immerse until thoroughly saturated, and on drying will be found to possess a marble-like appearance. A day or two after they should be warmed again, and finished by rubbing over their surfaces a solution of Canada balsam in turpentine.

Fioravanti's patent (1863, pat. 970) also relates to the conversion of "gypseous limestone" into a marble-like material. The carved articles are first heated up to 250° Fahr., and then carefully cooled and placed in a bath of mineral solution, which may be composed of a great variety of ingredients, such as lime-water, sulphate of iron, cyanides, aluminates, or caustic soda or potash. If it is desired to colour the articles, they should be treated alternately with salts that, reacting on each other, will produce the desired tint; thus for blue, the stone should be first steeped in a solution of prussiate of potash, and subsequently in one of an iron salt.

M. Soderini, of Florence, secured three patents in 1884 (Nos. 2,640, 2,787, and 2,847) for the treatment of gypsum, selenite, or other natural sulphate of lime. In patent 2,640 the stone is first deprived of water by heating, and then immersed in boiling aqueous solutions or mixtures of silicate of lime, sulpho-silicate of potash, acid fluosilicate of potash, double silicate of potash, and manganese, &c. Chloride of lime, sulphate of potash, phosphate of lime, soda and potash, and borax, are a few of the other substances mentioned as applicable. The material, after soaking in the selected bath, is again thoroughly dried, and again immersed, and re-dried, these operations being repeated as often as may be found necessary. The patent also provides for the colouring of marbles. The second patent (No. 2,787) relates to the treatment of sculptured articles in alabaster, which are to be hardened, and converted into artificial marble by being heated from 37.5° to 50° C., and then immersed in a solution of 8 parts of borax and 1.50th part of potassium biphosphate, in 100 parts of water, at a temperature of 22.5° C. After impregnation with this solution, the articles are dried at a temperature not exceeding 150° C. When cooled, they are immersed in a solution of borax, to which has been added nitric acid, in the proportion of from 30 to 50 per cent. of the water of the solution. The process may be modified by substituting oxalic for nitric acid, and by finishing the objects with a solution of Canada balsam in naphtha. Soderini's third patent was for the production of a black marble-like stone from any natural gypsum, by heating the shaped articles in a hot preparation of bitumen of suitable strength; the water is expelled, and

\* An obsolete term applied to the residue (composed of acid sulphate of potassium) left in the preparation of nitric acid from nitre and sulphuric acid.



the bitumen takes its place, filling the pores, and producing a compact mass of a brilliant black colour, and considerable hardness.

In Robbin's patent (1884, pat. 12,803) the blocks of gypsum are first dried and then charged or otherwise treated with tar, pitch, alkaline silicate, or chloride of aluminium, &c. The articles are then cut to the desired shape and indurated or finished by exposure to sulphurous vapours, and application of paraffin, gums, resins, &c. For the conversion of the soft natural carbonate of lime, known as chalk, into a harder and more useful stone, several attempts have been made; one of the earliest being in 1841, which involved the injection of the chalk with silicates of soda or potash, or with melted sulphur or bituminous, fatty, or resinous substances.

Darvill obtained in 1862 provisional protection only, for a process which aimed at the hardening of chalk by first drying and then immersing it in solutions of alkaline silicates or tungstates followed by one of chloride of calcium.

Miss H. G. Hosmer patented in 1877 the following process for the production of a marble like surface on ordinary limestone. The stone having been cut to desired shape is heated in a boiler with water under a pressure of several atmospheres for twelve or eighteen hours; it is then removed to another bath consisting of alum and water, in which it must remain for at least twenty-four hours, or even so long as a month: this treatment does not materially alter the colour of the stone, but renders it capable of a high polish. If a coloured marble be desired, the requisite dyes and pigments must be added to the alum bath.

Sandstone has also been "marbled," as it is termed, by impregnation first with a solution of sulphate of alumina and then with one of water-glass; it is thus made to assume a somewhat marble-like appearance, and rendered capable of being polished. By heating the impregnated sandstone strongly, partial vitrification results, and with ornamental effect if suitable colours have been previously added to the impregnating materials.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

16,621, Moulding, Pressing, and Drying Tiles. J. Larmanjat.

The tiles which are made according to this invention are made of hydraulic lime, cement, &c., and of relatively large size, and in different colours, so as to produce the representation of a leaf, for example, having the veins, half tints, and a well-defined outline. The construction of the moulds and presses are simplified, and an improved method of drying is adopted. The inlaid patterns are formed by removable pattern blocks being used with the mould, and when made the tiles are specially produced whilst drying, in order to fully produce the patterns on the face.

17,285, Cure for Smoky Chimneys. H. A. Hancock.

This invention relates to the employment of one or a series of fall-down or sliding leaves or plates to work in notched or recessed related side frames. The leaves are attachable to an open or domestic stove or fireplace, so that the leaf, or any number of them, can be lowered and be fixed in a position to induce up-draught in the chimney, and prevent down-draught.

17,993, Chimney and Ventilating Cows. J. Winterlood.

It is claimed that the cow which is the subject of this invention will, by its revolving action, produce an up-current of air, and the shape will at the same time prevent rain beating down,—a frequent cause of down-draughts. On a rim a number of vanes or fans of a treble curved form are fixed. Single curved vanes are fixed on cover surrounding the top rim. The cow is carried by an iron bracket or crossbar fixed in the tube, and suitable arrangements are made for oiling the spindle and bearing.

9,556, Faience, or Glazed Terra-Cotta Mantels, &c. J. Holroyd.

The idea of this invention is to manufacture Faience mantel-pieces and firesides, and such like articles, in such form that they may be readily put together and fixed where required, and can be removed without injury. The pieces are joined and adjusted in a "boat," and are made into one length or block of material.

12,758, Circular Saws. G. Montague.

The cutting edge of the teeth of the saw which is the subject of this patent is set in advance by bevelling the front edge of the tooth. The object is to produce a saw having teeth of such a character that will be strong and durable, and will work with equal facility crosswise or lengthwise of the grain.

13,444, White Lead. N. K. Morris.

The chief improvement in the manufacture of white lead, according to this invention, is the acetic acid being maintained in the form of vapour, and the gas and vapour is forced into the corroding chambers by suitable pumps.

### NEW APPLICATIONS FOR PATENTS.

Nov. 9.—16,219, W. Press, Cistern Valves.—16,234, J. James, Calcing Cement Materials, &c.—16,282, P. Neate, Portland Cement.—16,272, B. Holbrook, Ventilators.

Nov. 10.—16,285, J. Nicholls, Window-sash Holder and Bolt.—16,323, A. Bouvier and J. Billoir, Bricks, Tiles, &c.

Nov. 12.—16,354, R. Taylor, Mixing Machine for Concrete, &c.

Nov. 13.—16,408, J. Sharples, Flushing the Pans of Water Closets.—16,410, F. Stokes, Furnaces for Burning, Calcing Cement, Lime, &c.—16,448, T. Smith, Mitring Machines.

Nov. 15.—16,574, St. J. Day, Ventilators.—16,620, A. Hopton, Windows.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

8,004, D. Gill, Windguards for Shafts and Chimneys.—14,179, J. Killey, Inspecting the Interiors of Pipe Sewers, &c.—14,364, F. Rogers, Fastenings for Doors, Windows, &c.—14,681, J. Tolerton, Fireproof Curtains for Theatres, &c.—14,724, L. Wilson, Parquetry, &c.—14,853, G. Pankhurst, Brick, Tile, or Slab.—14,970, F. Prall, Combination Inglecock.—15,176, L. Tesle, Fireplaces.—15,379, J. Hargreaves and A. Armitage, Fire-grates.—15,531, J. A. Duckett, Water-closets.—15,576, P. Walker, Ventilating Rooms.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

15,306, J. Panwois, Water-meters.—494, J. Hilton, Fireproofing Buildings.—521, W. Wade, Doors and Panelled Structures.—578, F. Moore, Speaking-tubes.—608, K. Brunschweiler, Fire-crooks.—773, E. McClellan, Inlets for Sewers, Traps, and Drains.—2,731, W. Graham, Wood-cutting Bow-saw.—4,012, T. Dykes, Sash-fasteners.—4,170, A. Sizer, Slow-combustion Kitchener.—4,493, J. and A. Sizer, Chimney-cowls and Ventilators.—13,668, E. Mertz, Moistening and Cooling Air in Buildings, &c.—14,750, C. Waxm and A. Clerj, Cement or Artificial Stone.

### RECENT SALES OF PROPERTY.

#### ESTATE EXCHANGE REPORT.

Nov. 12.  
By W. HALL.  
Notting-hill—128, High-street, 26 years, ground-rent £55 ..... £720  
121a, High-street, 26 years, ground-rent £7 ..... 220  
122, High-street, 26 years, ground-rent £10 ..... 410  
North W. Church—Ground rent of £20, reversion in 90 years ..... 400  
Fulham—2, Osborn-avenue, 97 years, ground-rent £55 ..... 370  
52, Waldemar-avenue, 97 years, ground-rent £7 ..... 400  
32, Fulham Palace-road, 91 years, ground-rent £7 10s. .... 330

Nov. 13.  
By SLADE & BUTLER.  
Wood-green, Whittington-road—"Castlemans," 90 years, ground-rent £7 7s. .... 235  
Linton 73, Essex-road, Copthall ..... 80  
Clerkenwell—2 to 4, River-street, 24 years, ground-rent £23 1s. .... 1,485  
23, River-street, an income of £4 a year for 24 years ..... 42

Nov. 14.  
By C. & H. WHITELEY.  
New Southgate—9, Southgate Villas, 61 years, ground-rent £5 10s. .... 400

Nov. 15.  
By FREDER. SIMMONS & NEWMAN.  
City, Princes-square Ground-rent of £300, reversion in 80 years ..... 17,500

Nov. 16.  
By DICK & DALLAS.  
Fulham, Sherbrook-street—The South Kenington Laundry, 85 years, ground-rent £21 ..... 1,250

Nov. 17.  
By BAYTON & PROGRAM.  
Fulham—19, Hilton-terrace, 93 years, ground-rent £15 ..... 850

Nov. 18.  
By C. & H. WHITE.  
Putney—24, 26, and 28, High-street, freehold ..... 3,510  
Walsall-street—Six plots of land, area 5,380 ft., term 8 years, let at £31 19s. 6d.  
High-street—A plot of land, 1,710 ft., let at £22 10s.

Nov. 19.  
By PROTHROPS & MORRIS.  
Battersea Park-road—Nos. 286, 292, and 294, term 89 years, ground-rent £4 10s. .... 2,400

Nov. 20.  
By PROTHROPS & MORRIS.  
Forest Gate—1 to 10, Travellers Cottages, 79 years, ground-rent £57 ..... 1,720

Nov. 21.  
By BRAY, YOUNG, & CO.  
Oxford-street—45, James-street, freehold ..... 1,640

Nov. 22.  
By NEWSON & HARDING.  
Highbury—23, Riverside-road, 82 years, ground-rent £7 ..... 300

Nov. 23.  
By NEWSON & HARDING.  
Holloway—11, Bedford-street, 77 years, ground-rent £8 ..... 205

Nov. 24.  
By NEWSON & HARDING.  
9, 11, and 13, Raydon-street, 91 years, ground-rent £15 15s. .... 455

Nov. 25.  
By NEWSON & HARDING.  
Hackney—157, 159, and 161, Great Cambridge-street, 26 years, ground-rent £24 ..... 480

Nov. 26.  
By NEWSON & HARDING.  
Camden Town—24, Camden-road, and stabling, 60 years, ground-rent £7 10s. .... 1,100

Nov. 27.  
By NEWSON & HARDING.  
Kewish Town—An improved rental of £60, term 11 years ..... 140

Nov. 28.  
By NEWSON & HARDING.  
Machendon-square—97, Doughty-street, and workshop, term 13 years ..... 200

Nov. 29.  
By NEWSON & HARDING.  
Fulham—Ground-rents of £50 10s., reversion in 74 years ..... 1,490

Leytonstone, Hainsault-road—"Beech Villas," freehold ..... 480  
Thorne Villa, freehold ..... 450  
8 and 9, Primrose-terrace, freehold ..... 490  
6, Barnet-terrace, freehold ..... 245

By BRADSHAW & CO. (At Brighton.)  
Preston, Home-road—Three plots of freehold land ..... 960  
North-road—Preston Cottage, freehold ..... 620  
Three plots of freehold land ..... 780  
Middle-road—Two plots of freehold land ..... 850  
Ten freehold cottages ..... 1,130  
Preston-road—Acacia House, and the Brewery Tap, freehold ..... 4,000

Nov. 18.  
By DOLMAN & PEARCE.  
Regent's Park—22, St. Mark's-terrace, freehold ..... 840  
Primrose Hill—4, Oppidan's-road, 70 years, ground-rent £12 ..... 805

Nov. 19.  
By NORTON, TIER, & GILBERT.  
Fleet-street, No. 16—The lease and goodwill, "Groom's Coffee House," term 27 years, ground-rent £55 10s. .... 5,850  
Upper Norwood—49, Belvedere-road, freehold ..... 760  
Hammer-smith, Yeildham-road—Ground-rent of £52, reversion in 82 years, including mortgage ..... 2,035  
Biscay-road—Ground-rent of £96, reversion in 82 years, including mortgage ..... 2,060

## MEETINGS.

MONDAY, NOVEMBER 20.  
Society of Arts (Winter Lectures).—Captain W. de W. Abney, F.R.S., on "Light and Color." 8 p.m.  
Liverpool Architectural Society.—Sir James A. Pirton, F.S.A., on "Notes on the Successive Town Halls of Liverpool." 7 p.m.  
Leeds and Yorkshire Architectural Society.—Mr. A. Marshall, on "Furniture and Woodwork of the Seventeenth Century." 7.30 p.m.

TUESDAY, NOVEMBER 27.  
Institution of Civil Engineers.—Mr. J. E. Williams on "The Witham New Outfall Channel and Improvement Works." 8 p.m.

WEDNESDAY, NOVEMBER 28.  
Society of Arts.—Col. Gouraud on "The Phonograph." 8 p.m.  
St. Paul's Ecclesiastical Society.—Mr. J. Grimshire, on "A Short Account of the Ancient Cathedrals and Conventual Churches of Scotland." 7.30 p.m.

THURSDAY, NOVEMBER 29.  
Builders' Benevolent Institution.—Annual Dinner. 6 p.m.  
Society of Antiquaries.—8.30 p.m.  
Arts and Crafts Exhibition Society.—Paper on "Design" and Presidential Address, by Mr. Walter Crane. 8.30 p.m.  
Edinburgh Architectural Association.—Mr. D. MacGibbon on "The Castles of the Western Highlands and Islands of Scotland." 8 p.m.

FRIDAY, NOVEMBER 30.  
Institution of Civil Engineers (Students' Meeting).—(1) Mr. E. T. Hildred on "The Covered Reservoir of the Southampton Corporation." (2) Mr. H. Ashley on "The New High-level Storage-reservoir for the Grand Junction Waterworks Company at Hanger Hill, Ealing." 7.30 p.m.

SATURDAY, DECEMBER 1.  
Association of Public Sanitary Inspectors. Mr. D. Richards on "A Few Characteristics of the Three Principal Animals used for Human Food." 8 p.m.

## Miscellaneous.

**Liverpool Engineering Society.**—A meeting of the Liverpool Engineering Society was held on the 14th inst. Mr. Charles H. Darbishire, Assoc. M.Inst.C.E., President, in the chair, when a paper was read by Mr. T. Mellard Reade, C.E., F.G.S., on "The advantages to the Civil Engineer of a study of Geology." Mr. Reade, speaking of reservoirs, said that owing to a faulty idea of the geological surroundings of sites for such purposes, disastrous mistakes might easily be made, and he mentioned a case in which a local board incurred double expense owing to a reservoir being placed in an injudicious position, the water permeating its bed and sides, which might have been avoided had the engineer been in possession of better information on the particular branch of science to which he referred. The author spoke of subsidence which took place recently during the progress of the Mersey Tunnel works, he having indicated that the excavations would have to be carried on at a lower point than was primarily intended, in consequence of a channel filled with drift which lay below the level of the bed. This was eventually verified, resulting in the works being sunk to a lower level and the difficulty overcome. In the course of discussion the geological formation of the Wyrnwy Lake, Panama Canal, &c., &c., were entered into.

**Jerry-building in Moscow.**—Unfortunately the recent case of jerry-building in Moscow, whereby a house fell whilst in the course of construction, and which we quoted from the *Daily Chronicle*, was after all attended by great loss of life and serious injuries,—no less, states the official report, than sixteen workmen being killed and twenty-four more or less injured. The building in question was the Commercial Club of Moscow.



**New Mortuary for Marylebone.**—This is situated at the south corner of York-court (now closed), facing the old St. Marylebone Burial Ground, approached by a private roadway from Paddington-street. The buildings are arranged in three distinct blocks, separated from one another by paved roadways. On the south side is the Public Mortuary, the internal walls of which are lined with light glazed tiling their whole height, the floor is tiled, and the windows filled with tinted glazed lights. The east end of this room is divided off by a pointed archway, and will be available for use as a mortuary chapel for conducting funeral services. On the north side are contained in one block a Post-mortem Room and Coffin Store, also an Inquest Mortuary, and separated from it by a large glazed partition, a lobby for the convenience of jurors viewing the bodies. The arrangements in these two departments are very similar (although not on so large a scale) to the Morgue in Paris. With the exception of the coffin store, these rooms are lined with high dadoes of white glazed bricks or tiles, and are amply lighted by windows and roof lanterns. The revolving post-mortem table has been specially designed for the building on improved principles. The architects are Messrs. H. Saxon Snell & Son, and the builders Messrs. Wall Bros., whose contract for the works amounted to 3,151*l.* including the heating and gas fittings, carried out by Messrs. May Bros. The tiling was executed by Messrs. Simpson & Son.

**Sales by Auction.**—At the White Hart, Launceston, by auction, on November 24 current, the manor of Crackington St. Gennys, which embraces some two miles of the northern coast, by the lofty headlands of High Cliff, Dizard, and Combeak, between Boscawen and Bude. This estate, of over 1,510 acres, nearly all being under cultivation, contains a plantation, several farms, cottages, &c., and an inn. The ancient stone church of St. Genesius was restored in 1871, at a cost of nearly 1,200*l.*, by Mr. J. S. Aubyn. An extension of the railway to Camelford, in the immediate neighbourhood, is contemplated. On the 8th of December, by auction, at the Bell Hotel, Gloucester, the Churchdown Estate, consisting of the three farms, Parton Court, Upper Parton, and the moated Elm Bridge Court, lying along the high-road from Gloucester to Cheltenham. The property covers 789 acres of land—arable, pasture, and orchard—ring-fenced, and situated in Hucolecote (ecclesiastical) and Churchdown parishes, being distant about two miles from the Cathedral city.

**The Late Irish Exhibition.**—The Women's Art and Industries Section of this exhibition, under the presidency of the Countess of Aberdeen and a Committee of Ladies, has, according to the report, proved the most successful, as it has certainly been one of the most useful, departments of the exhibition. It was organised and managed by Mr. J. S. Wood, on behalf of Lord Arthur Hill, the honorary secretary, and, together with the Fancy Fair in July, realised a sum of nearly 3,000*l.* for the Executive Council of the exhibition. In addition to this, articles made by peasants in Ireland have been sold to the extent of 1,200*l.*, the greater part of which sum has found its way into schools and cottages throughout Ireland, either direct or through such societies as the Irish Home Industries Association. It is announced that Lady Aberdeen has arranged to continue the sale of the work of poor Irish peasants in the Old Irish Market Place during the Winter Exhibition at Olympia.

**The Royal Female School of Art.**—We are asked by Miss Louisa Gann, the Superintendent of this school, to announce that H.R.H. the Princess Christian will open, on Friday, December 7, the new studio for the study of the life, and the library, lecture, and class rooms, which have been added to the Royal Female School of Art, Queen-square, under the superintendence of Mr. Ernest Turner, Architect.

**Purbeck Stone.**—A correspondent, writing from Swanage, says that the figures referred to in our article of last issue, as being very badly weathered, are of Portland, and not of Purbeck, and were brought from another situation. They were too high up to be well seen, and we concluded they were the local stone.

**Great Tower-street.**—Messrs. Ashby Bros., Old Broad-street, E.C., are the contractors for rebuilding 2, Great Tower-street, for Messrs. Dore & Sons. Messrs. Young, Son, & Johnson are the architects.

**Progress in Japan.**—The land of the Mikado is advancing rapidly along the lines of European civilisation. From a number of statistics just published in the current issue of the *Board of Trade Journal*, we gather the following notes.—The number of post-offices existing in Japan in 1885 was 4,137; number of letters transmitted, 97,216,019; of newspapers, 15,258,671; of books and samples, 2,594,166. In the same year there were 886 money-order offices in operation, from which 833,300 orders were issued, and 826,626 paid. The number of telegraph offices in 1885-86 was 280; there were 5,779 miles of telegraph lines; the number of telegrams sent was 1,790,282; of telegrams received, 1,789,522. The mileage of railways in the same period was 410; number of railway-stations, 93; of locomotives, 76. The number of passengers carried was 4,067,970. The number of post-office savings-banks at the end of 1885 was 4,338; of commercial banks, 141, having 122 branch establishments. The average rate of wages paid to the working classes in Japan are: Carpenters, 1*s.* 1*d.* per day; plasterers, 1*s.* 2*d.* per day; stone-cutters, 1*s.* 2*d.*; sawyers, 1*s.* 1*d.*; slaters, 1*s.* 3*d.*; paper-hangers, 1*s.* 2*d.*; joiners, 1*s.* 1*d.*; tailors (Japanese fashion), 1*s.*; ditto (European fashion), 1*s.* 7*d.*; dyers, 10*d.*; smiths, 1*s.* 1*d.*; printers, 10*d.*; compositors, 1*s.* 1*d.*; agricultural labourers, 9*d.*; day labourers, 10*d.*

**A Novel Fireproof Curtain for Theatres.**—The chief of the Fire Brigade in the city of Malmo, in Sweden, Herr O. Berggren, has constructed a fireproof curtain for a theatre, which he calls a "water curtain." It consists of two sheets of canvas, steeped in a fireproof compound, joined together at the bottom and the sides in such a manner as to leave a fair space between, with water-mains running to the top, and when fire breaks out, and the water being turned on, the intervening space becomes filled with water, forming a solid wall of water between the audience and the scene. The other day experiments were carried out with the curtain in an improvised structure in Malmo, in presence of the officials of the town, architects, and others, when a pile of faggot-wood was heaped up against the curtain and set fire to, but the flames made no impression on it, even when petroleum was poured upon the fire. It is claimed by the constructor that the water-curtain is particularly suited for old theatres, whose construction will not sustain the weight of iron curtains; moreover, that the former do not get "jammed," which is so often the case with the latter, generally in the hour of need.

**The "Remington Standard Type-Writer."**—On Saturday, the 17th inst., we witnessed at Anderson's Hotel, Fleet-street, some demonstrations of the speed and other capabilities of this now well-known type-writer, of which a new and greatly-improved form, called the "No. 5," has just been introduced. With a little practice we believe it to be quite possible to "write" with this machine as quickly as with the pen, and even more quickly. One of our reporters has used the "Remington" for several years, and his testimony is to this effect. The more general employment of the type-writer by contributors, reporters, and correspondents would be a great boon to printers, and the innumerable errors arising from semi-illigible manuscript would no longer vex the souls of editors and readers. The type-writer has evidently passed out of the condition of a mere scientific toy, and has acquired for itself a position of great practical utility. We believe that it has a great future before it.

**Royal Institution.** The next course of Christmas lectures adapted to a juvenile auditory will be given by Professor Dewar, F.R.S., the subject being "Clouds and Cloudland." They will begin on December 27. During the recess, the staircases leading from the gallery of the theatre have been considerably altered, in order to facilitate more speedy egress.

**The Sanitary Institute.**—At a meeting of the Council of this Institute held on the 4th inst., Sir Douglas Galton, F.R.S., in the chair, Earl Fortescue, Dr. B. W. Richardson, F.R.S., Sir T. Spencer Wells, and eleven other Members and Associates, were enrolled, and further applications for membership were read.

**Peterborough Cathedral.**—A correspondent informs us that one of the pinnacles belonging to the north-west tower of the west front of Peterborough Cathedral fell on Tuesday afternoon during a sudden gust of wind. It dropped into an enclosed space and almost buried itself in the soil.

**The Effect of Moisture on Wood.**—Dr. Hildebrand has carried on investigations into the action of moisture upon various kinds of wood, the results of which he publishes in *Wiedemann's Annalen der Physik und Chemie*. We learn from the article on the subject, which is a lengthy one, that the author confined himself in his experiments to observing the extension of the longitudinal fibres of wood, leaving out of consideration the well-known phenomena of the swelling and the shrinkage of wood, which take place in a direction perpendicular to the longitudinal fibre. The author finds that, within certain limits, the length of wood in the direction of its fibre depends upon the amount of water present in its membranous tubes. Supposing a wood absorbs from 20 to 30 per cent. of water (which is the range of the increase of weight dried under an air-pump), the increase of length varies between 0.1 and 2 per cent. The greatest length is attained when wood is kept in air saturated with steam, or when placed in water. The weight and length of wood increase with the relative moisture of the air, and diminish with the decrease of moisture. The kinds of wood named below, which were exposed to the natural variations of moisture in the air during summer, showed the following changes:

|                     | Relative Moisture of the Air. | Variation in Length. Per cent. |
|---------------------|-------------------------------|--------------------------------|
| Mahogany.....       | 0.514                         | 0.057                          |
|                     | 0.570                         |                                |
|                     | 0.614                         |                                |
| Ebony.....          | 0.585                         | 0.03                           |
|                     | 0.798                         |                                |
|                     | 0.765                         |                                |
| Fir.....            | 0.814                         | 0.012                          |
|                     | 0.570                         |                                |
| White Beech.....    | 0.570                         | 0.05                           |
|                     | 0.814                         |                                |
| Red Beech.....      | 0.570                         | 0.043                          |
|                     | 0.814                         |                                |
| Alder.....          | 0.665                         | 0.047                          |
|                     | 0.728                         |                                |
| Oak.....            | 0.584                         | 0.052                          |
|                     | 0.798                         |                                |
| Lime-tree wood..... | 0.581                         | 0.028                          |
|                     | 0.814                         |                                |
| Maple.....          | 0.665                         | 0.019                          |
|                     | 0.798                         |                                |
| Pine.....           | 0.570                         | 0.043                          |
|                     | 0.814                         |                                |
| Poplar.....         | 0.570                         | 0.069                          |

The author says that great care should be exercised in selecting wood for measuring-rules. Mahogany and oak are entirely unsuited for rules, and the best woods to be used for the purpose are maple, fir, red beech, and lime-tree. He also states that the usual treatment of wood with polish, oil, or lacquer does not protect wood from the action of air saturated with steam. The best protection is afforded by lacquering, but the lac employed should be most carefully selected if the wood is intended for rules to be used for exact measurement. The author further adds that even ivory is not free from the action of moisture.

**The People's Palace Technical Schools, Mile End-road, E.**—With the view of spreading an interest in the question of technical education, and also for the purpose of demonstrating what such education means, the Trustees of the People's Palace have decided to organise two conversations to be held on the evenings of Saturday, November 24, and Saturday, December 1. The programmes will include (besides gymnastic displays in the gymnasium and a concert in the Queen's Hall) an exhibition in the New Technical Schools, recently built by the Drapers' Company. All the different departments of the Schools will be open for inspection, and the boys of the Technical Day School will be seen at work at the bench, vice, lathe, &c. Experiments will be performed by the boys in the chemical and electrical laboratories. Boys will be seen at work on various kinds of drawing, also at wood-carving, modelling, &c.

**Destruction of an Ancient Norwegian Church by Fire.**—The Nes Church, by the Lake Mjösen, in Norway, so well known to tourists through its picturesque situation, was totally destroyed by fire the other day. It dated from the early part of the thirteenth century. The fire was caused by the carelessness of workmen.

**Langley (Bucks).**—The committee of the Langley New Town Mission Church having instructed their architect, Mr. Albert E. Pridmore, of London, to prepare the necessary plans, &c., that gentleman has forwarded two separate schemes, which will be considered at the next meeting.



**The English Iron Trade.**—The English iron market is quieter, and weaker in some branches. Pig-iron is less steady, although quotations do not show much change. There is less pressure to do business both on the part of buyers and sellers. Scotch warrants have declined during the week. North of England iron can be obtained at 35s. 6d., but makers quote 34s. There is no change in pig-iron in Lancashire and Staffordshire, where prices are well-maintained. Hematite has experienced a fall, chiefly due to operations in warrants, and the quotation with makers for mixed numbers of Bessemer iron is 44s. 5d. Manufactured iron, with the exception of sheets, is not so strong as it was, and new orders might be placed a shade under recent quotations in the North of England and Scotland; elsewhere there is rather a stiffening tendency. There is a better inquiry for tin-plates, and quotations are unchanged. Steel is very well maintained, here being still a very good call for it, excepting for rails in the North, where the demand has quietened down. The shipbuilding trade is as active as ever, and engineers continue well supplied with work.—*Iron.*

**The New Fountain in Front of the Royal Palace in Berlin.**—The new fountain to be erected in front of the Royal Palace in Berlin, at the cost of the city, in commemoration of the present Emperor of Germany's foreign journeys, has already been finished by Professor Vegas, and is declared by German art critics to be the finest production of this well-known sculptor. It is now exhibited in the Berlin National Gallery, and consists of a marble basin of great size, on the brim of which the four main rivers of Germany are represented by four colossal female figures. From the centre of the basin rises a pile of heaped-up rocks, on the summit of which Neptune is seated, whilst the lower part is adorned with allegorical titans, marine monsters, &c., all of whom eject water columns in a manner arranged with the greatest harmony. The whole is about 25 ft. in height.

PRICES CURRENT OF MATERIALS.

| TIMBER.                                                 | £. s. d. | £. s. d. |
|---------------------------------------------------------|----------|----------|
| Greenheart, B.G. .... ton                               | 6 10 0   | 7 10 0   |
| Tank, E.I. .... load                                    | 9 0 0    | 14 0 0   |
| Sequoia, U.S. .... foot cube                            | 0 2 3    | 0 3 0    |
| Ash, Canada, .... load                                  | 3 10 0   | 5 0 0    |
| Birch " " " " " "                                       | 3 10 0   | 6 0 0    |
| Elm " " " " " "                                         | 4 0 0    | 5 0 0    |
| Fir, Danzig, &c. .... load                              | 2 0 0    | 4 0 0    |
| Oak " " " " " "                                         | 2 0 0    | 4 0 0    |
| Canada " " " " " "                                      | 5 10 0   | 7 0 0    |
| Pine, Canada red " " " "                                | 3 5 0    | 4 0 0    |
| " " yellow " " " "                                      | 3 10 0   | 5 10 0   |
| Lath, Danish, 1st fathom " " " "                        | 4 10 0   | 5 10 0   |
| St. Petersburg " " " "                                  | 5 0 0    | 6 10 0   |
| Wainscot, Riga, &c. .... log                            | 2 15 0   | 4 5 0    |
| " " Odessa, crown " " " "                               | 1 15 0   | 3 5 0    |
| Deal, Finland, 2nd and 1st, std. 100 " " " "            | 10 0 0   | 10 10 0  |
| " " 4th and 3rd " " " "                                 | 7 0 0    | 9 10 0   |
| Riga " " " " " "                                        | 7 0 0    | 8 0 0    |
| St. Petersburg, 1st yellow " " " "                      | 10 10 0  | 10 10 0  |
| " " 2nd " " " "                                         | 9 0 0    | 10 0 0   |
| " " white " " " "                                       | 8 0 0    | 10 10 0  |
| Swedish " " " " " "                                     | 8 0 0    | 10 10 0  |
| White Sea " " " " " "                                   | 0 0 0    | 17 0 0   |
| Canada, Pine, 1st " " " "                               | 18 0 0   | 25 10 0  |
| " " 2nd " " " "                                         | 11 0 0   | 17 10 0  |
| " " 3rd, &c. " " " "                                    | 7 10 0   | 10 10 0  |
| " " Spruce, 1st " " " "                                 | 9 0 0    | 10 0 0   |
| " " 2nd " " " "                                         | 8 0 0    | 10 0 0   |
| New Brunswick, &c. .... log                             | 6 15 0   | 8 15 0   |
| Battens, all kinds " " " "                              | 5 10 0   | 12 0 0   |
| Flooring Boards, sq. 1 in, pre-<br>pared, first " " " " | 0 11 0   | 0 14 6   |
| Second " " " " " "                                      | 0 8 0    | 0 10 9   |
| Other qualities " " " " " "                             | 0 6 8    | 0 7 9    |
| Cedar, Cuba " " " " " "                                 | 0 0 34   | 0 0 32   |
| Honduras, &c. " " " " " "                               | 0 0 22   | 0 0 3    |
| Australian " " " " " "                                  | 0 0 44   | 0 0 64   |
| Mahogany, Cuba " " " " " "                              | 0 0 44   | 0 0 64   |
| St. Domingo, cargo average " " " "                      | 0 0 44   | 0 0 64   |
| Mexican " " " " " "                                     | 0 0 44   | 0 0 64   |
| Tobacco " " " " " "                                     | 0 0 44   | 0 0 64   |
| Honduras " " " " " "                                    | 0 0 44   | 0 0 64   |
| Box, Turkey " " " " " "                                 | 5 0 0    | 12 0 0   |
| Walnut, Italian " " " " " "                             | 0 0 44   | 0 0 64   |

METALS.

|                                      |          |         |
|--------------------------------------|----------|---------|
| IRON—Bar, Welsh, in London .... ton  | 4 17 6   | 5 0 0   |
| " " at works in Wales " " " "        | 4 7 6    | 4 10 0  |
| " " Staffordshire, in London " " " " | 5 15 0   | 7 0 0   |
| COPPER—                              |          |         |
| British, cake and ingot .... ton     | 81 0 0   | 82 0 0  |
| Best selected " " " " " "            | 82 0 0   | 83 0 0  |
| Sheet, strong " " " " " "            | 88 0 0   | 88 0 0  |
| Chili, bars " " " " " "              | 78 0 0   | 78 0 0  |
| YELLOW METAL—                        |          |         |
| Lead " " " " " " lb.                 | 0 0 74   | 0 0 74  |
| LEAD—                                |          |         |
| Pig, Spanish " " " " " " ton         | 13 2 8   | 0 0 0   |
| English " " " " " " " "              | 13 10 0  | 0 0 0   |
| Sheet, English " " " " " "           | 14 7 6   | 0 0 0   |
| SILVER—                              |          |         |
| Silesian, special " " " " " " ton    | 18 10 0  | 18 12 6 |
| Ordinary brands " " " " " "          | 18 7 6   | 18 10 0 |
| TIN—                                 |          |         |
| Banco " " " " " " ton                | 103 0 0  | 0 0 0   |
| Billiton " " " " " " " "             | 8 0 0    | 0 0 0   |
| Strait " " " " " " " "               | 101 10 0 | 0 0 0   |
| Australian " " " " " " " "           | 101 10 0 | 0 0 0   |
| English Ingots " " " " " "           | 104 0 0  | 0 0 0   |
| ZINC—English sheet " " " " " " ton   | 29 10 0  | 29 10 0 |

| OILS.                               | £. s. d. | £. s. d. | OILS (continued).                   | £. s. d. | £. s. d. |
|-------------------------------------|----------|----------|-------------------------------------|----------|----------|
| Linedseed " " " " " " ton           | 19 7 6   | 19 10 0  | Tallow and Oleine " " " " " "       | 19 0 0   | 45 0 0   |
| Cocunut, Cochin " " " " " "         | 27 0 0   | 28 0 0   | Lubricating, U.S. " " " " " "       | 5 0 0    | 6 0 0    |
| Ceylon " " " " " " " "              | 28 0 0   | 0 0 0    | " " " " " " " " refined " " " "     | 7 0 0    | 12 0 0   |
| Palm, Lagos " " " " " " " "         | 27 10 0  | 0 0 0    | TURPENTINE—                         |          |          |
| Rapeseed, English pale " " " " " "  | 30 15 0  | 31 0 0   | American, in casks " " " " " " cwt. | 1 15 3   | 0 0 0    |
| " " brown " " " " " " " "           | 29 5 0   | 29 10 0  | Tar—Stockholm " " " " " " barrel    | 1 1 6    | 0 0 0    |
| Cottonseed, refined " " " " " " " " | 23 15 0  | 0 0 0    | Archangel " " " " " " " "           | 0 15 0   | 0 0 0    |

COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

COMPETITIONS.

| Nature of Work.                                     | By whom required.                                | Premium.           | Designs to be delivered. | Page. |
|-----------------------------------------------------|--------------------------------------------------|--------------------|--------------------------|-------|
| Approach to Assembly Rooms " " " "                  | Chelsea Hotel and Club Association, Ltd. " " " " | 15 Guineas " " " " | Dec. 3rd " " " "         | ii.   |
| Alteration to Institute Building, Faversham " " " " | The Committee " " " "                            | 10 Guineas " " " " | Not stated " " " "       | ii.   |

CONTRACTS.

| Nature of Work, or Materials.                      | By whom required.                              | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|----------------------------------------------------|------------------------------------------------|-----------------------------------|--------------------------|-------|
| Dust Cart " " " " " "                              | Lewisham Bd. of Wks. " " " "                   | Official " " " "                  | Nov. 27th " " " "        | ii.   |
| Guernsey Granite Spalls " " " " " "                | do. " " " "                                    | do. " " " "                       | do. " " " "              | ii.   |
| Building Married Quarters, Aldershot " " " "       | War Department " " " "                         | do. " " " "                       | Nov. 28th " " " "        | ii.   |
| Broken & cutish flagstone " " " "                  | Hendon Local Board " " " "                     | S. S. Grimley " " " "             | Dec. 3rd " " " "         | ix.   |
| Deepening Well " " " " " "                         | Cromer Waterworks Co. " " " "                  | J. C. Melliss " " " "             | Dec. 4th " " " "         | ii.   |
| Waterworks " " " " " "                             | Sutton in Ashfield L.B. " " " "                | G. Holson " " " "                 | do. " " " "              | ii.   |
| Iron Posts and Railings " " " " " "                | Brentford Local Board " " " "                  | Official " " " "                  | do. " " " "              | ix.   |
| Kerbing, Paving, and Patent Victoria Stone " " " " | Leyton Local Board " " " "                     | W. Dawson " " " "                 | do. " " " "              | ii.   |
| Water Mains, Hydrants, Slates, &c. " " " "         | Mansfield U.R.S.A. " " " "                     | G. Holson " " " "                 | Dec. 5th " " " "         | ii.   |
| Arcade, with Shops, Cellars, &c. " " " "           | Pontypool Arcade and Banking Co., Ltd. " " " " | Official " " " "                  | do. " " " "              | ii.   |
| Annual Stores " " " " " "                          | G. N. E. Co. " " " "                           | Official " " " "                  | Dec. 8th " " " "         | ii.   |
| Pumping Engine and Boiler " " " " " "              | West Ham Corporation " " " "                   | Lewis Angell " " " "              | Dec. 11th " " " "        | ii.   |
| Kerfing Rtg. Tar Paving " " " " " "                | Barking Local Board " " " "                    | C. J. Dawson " " " "              | Dec. 12th " " " "        | ix.   |
| Road-making Works " " " " " "                      | do. " " " "                                    | do. " " " "                       | do. " " " "              | ix.   |
| School, Lewisham " " " " " "                       | Leathersellers' Company " " " "                | E. L. Parsons " " " "             | Dec. 23rd " " " "        | ii.   |
| New Pelican Club " " " " " "                       | The Proprietors " " " "                        | Walter Emden " " " "              | Not stated " " " "       | ix.   |
| Barracks at Canterbury " " " " " "                 | Salvation Army " " " "                         | J. W. Dunford " " " "             | do. " " " "              | ix.   |
| Hospital at Swansea " " " " " "                    | The Committee " " " "                          | J. B. Wilson " " " "              | do. " " " "              | ix.   |

PUBLIC APPOINTMENT.

| Nature of Appointment.         | By whom Advertised.          | Salary.                  | Applications to be in. | Page. |
|--------------------------------|------------------------------|--------------------------|------------------------|-------|
| Clerk of the Works " " " " " " | Camberwell Guardians " " " " | 3l. 3s. per week " " " " | Nov. 29th " " " "      | xiv.  |

TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

**BERMONDSEY.** Reduced tenders for seven new shops and a stable, Bermondsey New-road, for Mr. J. E. Arndell. Mr. Edward Cross, architect, 32, Bermondsey-square, S.E. Quantities by Mr. Thomas J. Fife, 2, Whitlington-avenue, E.C.—

|                                    |            |
|------------------------------------|------------|
| F. & M. F. Higgs " " " "           | £3,000 0 0 |
| W. Shepherd " " " "                | 2,972 0 0  |
| T. Rider & Son " " " "             | 2,944 0 0  |
| A. White & Co. " " " "             | 2,916 0 0  |
| W. & F. Croaker (accepted) " " " " | 2,852 0 0  |

**BERMONDSEY.**—For erection of workshops, Earl-road, for Mr. Doerr. Mr. Edwd. Cross, architect, 32, Bermondsey-square, S.E. Quantities by Mr. Thos. J. Fife, 2, Whitlington-avenue:—

|                            |            |
|----------------------------|------------|
| Greenwood " " " "          | £1,628 0 0 |
| Down " " " "               | 1,496 0 0  |
| Tarrant " " " "            | 1,490 0 0  |
| Shepherd " " " "           | 1,483 0 0  |
| Chavley " " " "            | 1,469 0 0  |
| A. White & Co. " " " "     | 1,469 0 0  |
| Croaker " " " "            | 1,462 0 0  |
| Spencer & Co. " " " "      | 1,450 0 0  |
| Higgs " " " "              | 1,430 0 0  |
| Holloway " " " "           | 1,383 0 0  |
| Tyerman (accepted) " " " " | 1,355 0 0  |

**BOW.** For pulling down and re-erecting the "Five Bells," Old Ford-road, B. W. R., and the erection of two cottages adjoining, for Messrs. Charrington & Co. Mr. J. M. Knight, architect:—

|                             |            |
|-----------------------------|------------|
| J. & H. Cocks " " " "       | £2,693 0 0 |
| Bentley " " " "             | 2,655 0 0  |
| Hunt " " " "                | 2,446 0 0  |
| F. & P. J. Wood " " " "     | 2,424 0 0  |
| Herd & Son " " " "          | 2,377 0 0  |
| Gladding (accepted) " " " " | 2,346 0 0  |
| Hood " " " "                | 2,294 0 0  |

**BRIGHTON.**—For the construction on the Madeira-road of a terrace-wall, an enclosed shelter hall with rooms and lavatories attached thereto, a hydraulic lift, and other works in connection therewith, for the Corporation of Brighton:—

|                                             |             |
|---------------------------------------------|-------------|
| G. G. Garbutt, Brighton " " " "             | £21,638 0 0 |
| W. J. Bottrell, L. " " " "                  | 17,460 0 0  |
| J. C. F. Marshall, Brighton " " " "         | 17,690 0 0  |
| W. Hill & Co., London " " " "               | 17,100 0 0  |
| J. T. Chappell, London and Brighton " " " " | 16,444 0 0  |
| W. H. Seal, Worthing " " " "                | 16,355 0 0  |
| A. Kellett, Ealing " " " "                  | 15,770 0 0  |
| W. W. Smith, Worthing " " " "               | 15,539 0 0  |
| A. Dean, Brighton " " " "                   | 15,500 0 0  |
| Kirk & Rendall, Worthing " " " "            | 15,310 0 0  |
| J. Harrison & Son, Brighton " " " "         | 15,250 0 0  |
| Cheeman & Co., Brighton " " " "             | 15,061 0 0  |
| C. G. Reed & Son, Brighton " " " "          | 15,060 0 0  |
| G. E. Wallis & Son, Maidstone " " " "       | 14,637 0 0  |
| Perry & Co., Bow " " " "                    | 13,950 0 0  |
| Lonsley & Co., Crawley (accepted) " " " "   | 13,975 0 0  |
| Deacon & Co., Lower Norwood " " " "         | 13,400 0 0  |

[A tender was also submitted to perform the works for £14,514, but no name was attached to it.]

**BETHNAL GREEN.**—For clean-linen room at laundry, covered ways and sanitary turret at the Workhouse, Messrs. A. & C. Harton, architects, 16, Leadenhall-street. Quantities supplied:—

|                                                |             |
|------------------------------------------------|-------------|
| Jackson & Todd " " " "                         | £21,579 0 0 |
| E. Lake " " " "                                | 1,398 0 0   |
| H. Adams " " " "                               | 1,383 0 0   |
| Stranes & Son " " " "                          | 1,346 0 0   |
| W. Johnson " " " "                             | 1,280 0 0   |
| J. Holland " " " "                             | 1,278 0 0   |
| Harrett & Tower " " " "                        | 1,278 0 0   |
| C. J. Sherwood " " " "                         | 1,248 0 0   |
| R. Edwards, jun. " " " "                       | 1,193 0 0   |
| Apila & Redgrave " " " "                       | 1,191 0 0   |
| Geo. Lusk " " " "                              | 1,116 0 0   |
| E. Cox " " " "                                 | 1,084 0 0   |
| Jas. Edmunds, J. Kerbey-st. Poplar, E. " " " " | 997 10 0    |

\* Accepted.

**CAMBRIDGE.**—For two houses, Richmond-road, Huntingdon-road, for Mr. A. Giordano:—

|                                                   |          |
|---------------------------------------------------|----------|
| Thoday & Son " " " "                              | £290 0 0 |
| Williams " " " "                                  | 894 10 0 |
| Kidman " " " "                                    | 893 0 0  |
| Clayton " " " "                                   | 876 15 0 |
| Kerridge & Shaw " " " "                           | 852 0 0  |
| Saint " " " "                                     | 843 0 0  |
| Coulson " " " "                                   | 785 0 0  |
| Prime " " " "                                     | 761 0 0  |
| Garrow " " " "                                    | 759 0 0  |
| Allerton & Wheeler (Cambridge and London) " " " " | 749 0 0  |

[All of Cambridge.]

**CLAPHAM JUNCTION.**—For new bank premises at Clapham Junction, for the London and South-Western Bank, Limited, exclusive of fitting. Messrs. Tolley & Son, architects, 68, Cannon-street. Quantities by Messrs. Parr & Son, New Broad-street House:—

|                              |             |
|------------------------------|-------------|
| G. E. Bryan " " " "          | £28,731 0 0 |
| Gould & Brand " " " "        | 6,427 0 0   |
| J. & O. Boyer " " " "        | 6,342 0 0   |
| W. Shepherd " " " "          | 6,200 0 0   |
| W. Johnson " " " "           | 6,100 0 0   |
| J. F. Chappell " " " "       | 6,049 0 0   |
| C. Kynoch (accepted) " " " " | 5,675 0 0   |

**HAMMERSMITH.**—For the erection of new board-room, offices, dispensary, &c., Fulham Palace-road, Hammersmith, for the Guardians of the Poor of the Fulham Union. Messrs. H. Saxon Snell & Son, architects, London:—

|                                                     |              |
|-----------------------------------------------------|--------------|
| Oldrey & Co., Westbourne Park " " " "               | £219,127 0 0 |
| Mowlem & Co., Millbank " " " "                      | 19,577 0 0   |
| Ward Clarke, Penmore-street, S.E. " " " "           | 18,838 0 0   |
| T. Bendon, Hammersmith " " " "                      | 18,830 0 0   |
| J. H. Mollett, 42, Imperial-buildings, E.C. " " " " | 18,811 0 0   |
| H. Knight, Morden " " " "                           | 18,630 0 0   |
| Wall Bros., Carlton-road, N.W. " " " "              | 18,625 0 0   |
| J. T. Chappell, Fulham " " " "                      | 18,617 0 0   |
| Leslie & Co., Kensington " " " "                    | 18,571 0 0   |
| W. J. Adcock, Ladywell, Dover " " " "               | 18,479 0 0   |
| Lonsley & Co., Crawley " " " "                      | 17,494 0 0   |
| Ashfold & Co., West Kensington " " " "              | 17,432 0 0   |
| Klew & Co., West Kensington " " " "                 | 17,350 0 0   |
| Thos. Nye, Ealing, Middlesex " " " "                | 17,100 0 0   |
| A. Bruckel, West Kensington " " " "                 | 16,990 0 0   |
| Roze & Co., Fulham " " " "                          | 16,315 0 0   |

\* Accepted.

DARENTH (Kent).—For laying gas-mains and supplying and fixing road-lamps in the roads of the New Blocks of the Asylum for Imbeciles, Darenth, near Dartford, Kent, for the Metropolitan Asylums Board. Messrs. A. & C. Harston, architects, 15, Leadenhall-street, E.C. Quantities not supplied.

|                                  |          |
|----------------------------------|----------|
| Coxall & Co.                     | £495 0 0 |
| Rugg & Co.                       | 115 17 6 |
| Foster & Son.                    | 429 10 0 |
| R. Crane                         | 398 0 0  |
| Christie                         | 393 15 0 |
| Summerscales & Son               | 390 0 0  |
| T. Torode                        | 380 0 0  |
| Williams & Co.                   | 378 10 0 |
| F. Bird & Co.                    | 368 0 0  |
| Hayward Bros. & Co.              | 358 0 0  |
| Beaham & Son, Wigmore-street, W. | 351 0 0  |

\* Accepted.

LONDON.—For finishing No. 43, Nevern-square, South Kensington, for Mr. E. Ward. Messrs. Morley & Letts, surveyors, 185, Earl's Court-road, S.W.—

|              |          |
|--------------|----------|
| Toten & Sons | £20 0 0  |
| T. W. Heath* | 220 12 0 |

\* Accepted, exclusive of stoves, over-mantels, and wall-hangings.

LONDON.—For sanitary works at 19, Nevern-square, S.W., under the direction of Messrs. Morley & Letts, surveyors, 185, Earl's Court-road, S.W.—

|              |          |
|--------------|----------|
| Toten & Sons | £110 0 0 |
|--------------|----------|

LONDON.—For further works to premises No. 21, Budge-row, E.C. for Messrs. James Wrigley & Son, Limited. Mr. Albert E. Fridmore, architect, 2, Broad-street-buildings, E.C.—

|                      |          |
|----------------------|----------|
| T. Taylor (accepted) | £108 0 0 |
|----------------------|----------|

[No competition.]

LONDON.—For painting and decorating work, &c., at West Lodge, Barnsbury-square, N., for Mr. E. H. Bavidon. Mr. Albert E. Fridmore, architect, 2, Broad-street-buildings, E.C.—

|                     |          |
|---------------------|----------|
| J. Crane (accepted) | £132 8 0 |
|---------------------|----------|

LONDON.—For alterations and additions to No. 89, Upper-street, Islington, for the Misses Edwards. Mr. Edmund J. Harrison, archt, 72, Chancery-lane, W.—

|                                |          |
|--------------------------------|----------|
| H. Baylis, Highbury (accepted) | £334 0 0 |
|--------------------------------|----------|

LONDON.—For additions to No. 53, Devonshire-street, Islington, for Dr. F. H. Hume. Mr. Edmund J. Harrison, architect, 72, Chancery-lane, W.C.—

|                                                     |          |
|-----------------------------------------------------|----------|
| W. Goodman                                          | £183 0 0 |
| Drew & Cadman                                       | 182 0 0  |
| G. Hackett                                          | 167 10 0 |
| J. H. Fernley, Upper Tootington Park, N. (accepted) | 115 0 0  |

LONDON.—For repairing, painting, decorating, sanitary and other works, at 74, Grosvenor-street, W., for Dr. Thomas Buzzard. Mr. M. P. Manning, architect. Sanitary works under the superintendence of Prof. Corfield. McCormick & Sons, 34, Canonbury-road, Islington, N. (accepted).....

|                                                                |          |
|----------------------------------------------------------------|----------|
| McCormick & Sons, 34, Canonbury-road, Islington, N. (accepted) | £735 0 0 |
|----------------------------------------------------------------|----------|

ORPINGTON (Kent).—For the erection of new stables and for various works. Mr. St. Pierre Harris, architect and surveyor, 1, Basinghall-street, E.C.—

|                       |          |
|-----------------------|----------|
| G. Johnson (too late) | £506 0 0 |
| W. Owen               | 437 0 0  |
| Somerford & Son       | 387 0 0  |
| Knights*              | 369 0 0  |

\* Accepted, subject to modification.

PECKHAM.—For bringing out shop, &c., at 118, Ryelane, for Messrs. Airey & Pearson. Mr. John Farrer, architect, 29, Finsbury-pavement.—

|                             |          |
|-----------------------------|----------|
| Newton, Peckham             | £278 0 0 |
| Rate, Peckham               | 480 0 0  |
| Troweake, Peckham           | 483 10 0 |
| Lobb & Clor, Peckham        | 438 0 0  |
| Smith & Son, Norwood        | 415 0 0  |
| W. Smith, Camberwell        | 413 10 0 |
| Money Marsland, Wandsworth* | 412 0 0  |

\* Accepted.

SOUTHWARK.—For alterations at the "Winchester Arms," Suffolk-street, Borough, for Mr. James Whiffen. Mr. W. J. Redle, architect.—

|                          |            |
|--------------------------|------------|
| Walker & Sons (accepted) | £1,500 0 0 |
|--------------------------|------------|

Gusfitter, W. Winn (accepted).

Peuterer, J. Davidson (accepted).

WANDSWORTH.—For erecting stables at the "Two Brewers," for Messrs. Young & Co.—

|                           |          |
|---------------------------|----------|
| Money Marsland (accepted) | £200 0 0 |
|---------------------------|----------|

[No competition.]

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D. & Co. (sample received).—F. W. R. W. N. E. R. J. H. E. G. J. W. J. E. G. (we have not space for so long a letter, and we are satisfied that our general representation is correct. We have no interest in the matter, and you probably have).—F. S. W. (thanks; not required).—W. C. (the work is under the direction of the architect, and will be published).  
All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline publishing out books and giving addresses.  
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# The Builder.

Vol. LV. No. 230.

SATURDAY, DECEMBER 1, 1888.

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## Water Engineering.



THE author of the work published under this title\* treats his subject under the following main divisions:—

1. Storage of Water.
2. Measurements of Rainfall and Drainage-flow.

3. Transmission in Artificial Ducts.
4. Flow in Natural Watercourses.
5. Water-power.
6. Supply and Distribution for Domestic Purposes.
7. Floods, and Means of Prevention and Regulation.
8. River Conservancy.

In the treatment of so comprehensive a subject the author has not confined himself within the limits of his own experience, but has more or less, in all the above heads, collated the results deduced from the experiments of the most eminent authorities, and has presented them in a compact and practical form, accompanied by very clear and detailed explanations, so as to render them easily intelligible to those who may not be able to cope with the higher mathematical calculations involved in hydro-dynamics. In the chapter devoted to reservoirs generally a table is given, framed from seventy-six examples, to show that the average depth of a reservoir has a ratio of about four-ninths to the greatest depth; but, as the majority of the examples cited are comparatively small works, the important element of the configuration of the site does not affect the calculation so much as in the case of very large reservoirs—such, for instance, as those existing in India and in the natural basins of great rivers, where the retaining embankment is very short, while the basin behind it is of enormous size. In those instances a ratio of two-thirds of the depth at the embankment will be probably found to be nearer the mark. In describing the details of construction of reservoir embankments, many useful hints are given; and with reference to the employment of puddle walls, the author justly remarks that, if so much importance is attached to the necessity of protecting a puddle wall from contact with water under

great pressure, it might also seem to be of little use, and might be dispensed with altogether. Perhaps the author is not aware that out of the tens of thousands of reservoir embankments made by the native rulers of India in centuries gone by, especially those in the Madras Presidency, not one has been constructed with a puddle wall. The embankments were all made with earth carried in small quantities on men's heads and deposited in thin layers, which were consolidated by the constant tramp of the hundreds of labourers employed thereon, so that the material, being originally homogeneous, became so compacted a mass that leakage very rarely took place. The chief, if not the only, object of the puddle wall being to prevent leakage, its more obvious position, wherever it is necessary to use it, would seem to be on the inner slope; and as every large reservoir ought to have its inner slope covered by a substantial stone revetment, the puddle would be protected from atmospheric influence, and so the shrinkage, if any, would be confined to the surface. It is obvious that if the inner portion of an embankment is not water-tight, and so the hydrostatic pressure is brought directly against the puddle wall, the latter virtually performs the office that it would do if laid on the interior slope, at the same time being deprived of the support of one-half the mass of the embankment. If, on the other hand, the material of the inner portion of such embankment is homogeneous and water-tight, then the use of puddle seems superfluous.

In treating of the various methods of measuring the flood-volume of rivers, the author correctly questions the applicability of the formulae deduced from the experiments on the large rivers of America to the small rivers of Great Britain. But the United States engineers have conclusively demonstrated the fact that the point in the flood-section where the maximum velocity is met with will be found, in rivers from 10 ft. to 20 ft. deep and upwards, to be not immediately at, but below, the surface, and that, owing to various causes, the section of the flood-velocity film assumes the form of a parabola. This being the case, the usually-accepted formulae for ascertaining the mean velocity based on a ratio of the surface and bottom velocities require some modification in the case of rivers with a greater flood-depth than 10 ft.

A considerable portion of the volume is devoted to the application of water as a motive-power, and this important subject is treated very carefully and exhaustively. It

is followed by a description of the various works connected with the supply of water for domestic purposes, and contains many useful particulars of some of the most recent large schemes undertaken for that purpose. In the chapter on "Floods," the author holds views which, though not accepted by many leading engineers, have, nevertheless, much to commend them. Mr. Slagg points out that a great deal may be done to mitigate the injuries arising from floods "by a judicious system of storage and regulation of the mass of water over and above the carrying capacity of the river," observing that "the storage required is not that of the same nature needed for the supply of towns, except subsidiarily, and for a comparatively small portion of the water to be dealt with. It is rather the regulation of the flow of the excessive rain-falls than the absolute conservation which is in this case the object of 'storage,' and this takes it out of the category of those impossibilities which have sometimes been said to exist in this matter," and "that, therefore, they cannot, as is sometimes affirmed, be separate questions, but must be considered together." The apportionment of the cost, which is always alleged to be one of the practical difficulties in solving the problem of prevention of floods, is met by demonstrating how the water or flood question is not one in which a given expenditure of money confers a benefit strictly in proportion to its amount. The abandonment by the French Government of the proposals for controlling the floods of the Seine by means of reservoirs has been quoted as sufficient to discredit the practicability of such a method, but it is simply an argument, so far as it goes, of the extent or limit within which the French engineers were prepared to deal with that particular instance. That it is a plan adopted by nature is exemplified by the gigantic lakes which are found at the sources of the great equatorial rivers, to which they act as regulating reservoirs, and that, but for them, the floods of such rivers as the Nile would, instead of being the means of fertilisation and a source of wealth to the country through which it flows, simply carry devastation throughout its length and breadth.

When treating of River Conservancy, Mr. Slagg replies to an observation made by Mr. Wheeler, in his pamphlet on the Fen Rivers of the East Coast, to the effect that the facts adduced by him are "sufficient answers to those theorists who are in the habit of advocating the formation of reservoirs to

\*"Water Engineering: a Practical Treatise on the Measurement, Storage, Conveyance, and Utilisation of Water." By Charles Slagg, A.M.I.C.E. London: Crosby Lockwood & Son, 7, Stationers' Hall-court, Ludgate-hill.



regulate the streams and prevent floods," by stating that "nothing is intended to be conveyed by the 'theorists' more than that when suitable reservoir sites exist the flood-waters now flowing from the areas above them, to the detriment of the rivers, may be so regulated that the owners of those lands may substitute works for money in respect to their liability to taxation in contributing to the funds required for the conservancy of the rivers below them." The author's remarks respecting the incidence of the rating necessary to meet the expense of flood-protective works are so much to the point that they merit being quoted verbatim:—

"Whether we look at the agricultural interest, the mining and manufacturing interests, the tenant or the landowner, millers, highway boards, county magistrates, railway companies, carriers by water, or municipal authorities, we find them all implicated in the deterioration of the regimen of rivers, as well as the owners of the lands from which the water flows without regulation; and it is not one person, party, or body who should be called upon to repair and maintain the regimen of rivers, but all in the same river-basin, whether dwellers or receivers of rent, cultivators or owners of the soil; for all who have access to the river-banks contribute to its deterioration, while none does anything to improve it or even keep it in decent repair. The river is the first and chief cause of prosperity of the dwellers in the valley, whether they directly use it or not, and even though some of them never see it. Its repair and maintenance, then, is the duty of all, and if each would make good the damage he does, whether actively or by permission only, no one would have any right to call upon him to do more; but, as a practicable thing, this is out of the question, and he must contribute to a common fund according to his means and liabilities, if he wishes to continue to enjoy his own right in the river, and what it brings him, without injuring his neighbour thereby. A good many people have not only wished to have all these advantages without doing anything in return, but have actually had them and converted them into hard cash. They should be allowed an opportunity now of contributing something to the repair of the damage they have done. The apportionment amongst all parties, so as to be just to all, is not in this case a matter upon which hairs can be split, but a near approximation to strict justice may be made without much trouble—without, that is to say, more trouble than the redress of a long-standing and general grievance must necessarily entail."

There is one element of the water question, however, which, singularly, Mr. Slagg has omitted to include and discuss in his useful work, and that is, water transit, and it is all the more singular, seeing that the restoration and improvement of internal water communications, not only in our own country, but throughout the civilised world generally, is one of the foremost and most pressing questions of the day. The regulation, not only of floods, but of its waters generally, is of the utmost importance and essential to the well-being of every country; and whenever they are so regulated as to be restrained from doing harm by storage of the surplus, they will not only afford the means of meeting deficiencies in years of drought such as that of last year, but they would, when properly cultivated and judiciously regulated, contribute towards maintaining the navigability of rivers which would otherwise be impracticable, and also solve the difficulty often experienced of feeding existing canals with a sufficient supply. This branch of the water question also cannot, and ought not to, be considered separately; but though omitted in Mr. Slagg's book, he has, nevertheless, done good service in drawing prominent attention to the intimate connexion that exists between the various branches of water engineering—a fact which all those engaged in the development of water projects would do well to bear in mind.

**Art Congress at Liverpool.**—The detailed programme of this Congress, to be held next week, will be found on pp. 399-400.

## "THE HOLY PLACES OF JERUSALEM."

BY MAJOR CONDER, R.E.



PROFESSOR HAYTER LEWIS'S work is of high importance to all who take interest in the main questions of Jerusalem archaeology. It is the first expression of professional architectural opinion on two of the principal subjects of controversy, and will carry weight with it, especially as it has been deliberately prepared after more than one personal visit to the sites discussed. The late Mr. Fergusson always insisted that no architectural authority besides himself had been in the position to give an opinion of value. He put aside the views of De Vogüé and of Willis, equally with those of the Palestine explorers who followed. Prof. Hayter Lewis, possessing all the advantages of special knowledge concerning the ancient architecture of the Levant, has now given us his opinion, which proves fully to support those of De Vogüé, of Sir C. Warren, and of Major Conder, on both the great questions at issue, while adding the results of facts unknown when Mr. Fergusson formulated his theories forty years ago.

Two distinct questions are involved,—one of which is only slightly touched, while the other occupies the greater part of the volume. The first is the position and extent of Herod's Temple; the second is the character and date of the building known as the Dome of the Rock, in the Jerusalem Haram. As regards the first of these, Prof. Hayter Lewis's views accord with those expressed by nearly every writer who can claim authority, since the recovery by Sir C. Warren of the great Ophel wall south of the Jerusalem Haram. Mr. Fergusson believed, not only that the Dome of the Rock was a chapel built by Constantine over the Holy Sepulchre, but also that this was the real site of our Lord's tomb; and since it stands in the middle of the Haram area, it was a necessity of his theory that this area should not be co-extensive with that of Herod's temple, which he held to have occupied a square of 600 ft. side in the south-west part of that area. In favour of this view, which is controverted by Robinson, De Vogüé, Warren, and Conder, he adduces Josephus's estimate of the length of the Temple cloisters,—a stadium square; and on his plans shows the south-east wall of the city joining the supposed east cloister of his temple; for Josephus says that the Ophel wall "joined the eastern cloister" (5 Wars, iv. 2). Sir Charles Warren's excavations on Ophel were systematic and numerous,—fifty shafts were sunk, and the Ophel wall was finally discovered, not where Mr. Fergusson expected it to be,—600 ft. from the south-west angle of the Haram, but actually adjoining the south-east angle of the enclosure as now existing. This (if we follow Josephus) clearly points to the east wall of the Haram as the east wall of Herod's Temple cloisters; and as regards the estimated length of "a stadium" nothing could be less scientific than to rely on Josephus's estimate (writing in Rome), since a critical examination of that author shows us that his measurements are always unreliable, and his statements of distance, with his other figures, often self-contradictory.

Professor Hayter Lewis's objections (p. 16) to Fergusson's view as to the Temple seem to be fully borne out, therefore, by the above argument, to which he does not refer; and there are two other reasons which tend to the same conclusion. In the first place, the Talmud gives us detailed measurements, and other facts, concerning Herod's Temple, in a tract written in Palestine while the ruins were still distinguishable; and these cannot be reconciled with the small area proposed by Mr. Fergusson. From the Mishna (Tract Middoth or "measurements") it is possible to construct a ground-plan, which agrees with

As the author of this review has himself taken an important part in some of the discussions about the topography of Jerusalem to which a reference is made, we have thought it best, with his consent, to depart from our usual practice, and append his name to the article.—Ed.  
"The Holy Places of Jerusalem." By T. Hayter Lewis, F.S.A. Murray, 1888.

Josephus's account in all respects, except in his rough estimate of size.

The second additional argument concerns the sections of the Temple, and has already been illustrated with diagrams in the pages of the *Builder* (January 25, 1879, p. 94). The shape of the rocky Haram ridge has been traced by careful instrumental levelling. The rock is on the surface near the centre, and in the north-west; and beneath the surface it has been traced by seventy-five measurements, in well-mouths and vaults. There is thus no doubt as to where "the top of the hill," on which Josephus says the Temple stood, actually exists in the area; and it is an argument which should carry conviction to the minds of builders, that Mr. Fergusson's theory necessitates, beyond dispute, foundations from 30 ft. to 90 ft. deep to reach the rock (on which the heavy walls must have been founded); whereas, if the Temple stood where the Dome of the Rock now stands, its courts, descending by steps, would have roughly coincided with the position of the present "platform" and outer courts of the Haram; and it is found that only foundations of 2 ft. or 3 ft. would thus be necessary (see the block plan published in the Jerusalem volume of the Palestine Exploration Fund Memoirs). Plans of the Temple prepared before these facts were known not unnaturally disregarded questions as to foundations, and these practical considerations may not be understood by purely literary students of the question: but the results of excavation and of levelling will take precedence in the minds of architects over ancient rude descriptions. Not a trace of the walls which Mr. Fergusson expected to be found has proved to exist; the south-west, the north-west, and the south-east corners of the Haram agree in character with the ancient accounts of the corresponding corners of Herod's enclosure,—the Tyropoeon bridge having been discovered at the first, the rocky scarp and outer fosse of Antonia being recognised at the second, and the Ophel wall having been discovered at the third. Thus the views of the majority of antiquaries have been shown to be correct, by the discoveries of engineers and surveyors, and are now supported by the professional opinion of a scholar and an architect. Knowledge has taken the place of theory, and Prof. Hayter Lewis remarks very truly that the question of the "site of the Temple is not to be lightly entered upon by any one, until he has made a special study of the descriptions and references scattered through the various books of the Bible, the Talmud, Josephus, and other writers, and made himself acquainted with the elaborate drawings (published by the Palestine Exploration Fund in their volume on Jerusalem) to which I have referred." Many of these drawings are reproduced in the pages of the work now under consideration.

The second question is that of the origin and date of the Dome of the Rock. When Mr. Fergusson wrote first in 1847, the Haram was closed to Christians. Mr. Catherwood's drawings,—good as they were,—gave imperfect information, and were in some respects misleading. There was a *prima facie* case in favour of the building being of Byzantine character, and the inscriptions on its walls were unknown. Mr. Fergusson's contention that this site was the true Sepulchre of Christ (as Professor Hayter Lewis remarks) never took root. All recent writers have condemned this feature of his theory; and the information since collected from ancient texts and from exploration has satisfied all later writers that Constantine's basilica of the Holy Sepulchre stood on the site afterwards covered by the Crusading Cathedral, which still exists as a church.

The question as to the real origin of the Dome of the Rock was, however, not placed on a scientific basis until the appearance of De Vogüé's splendid work, "Le Temple de Jérusalem," in 1864. His plans of the area have been superseded by the survey of Sir Charles Wilson, published in 1865, but his study of the interior of the Dome of the Rock still remains a standard work. De Vogüé rejected alike the Temple theory and



the Sepulchre theory of Fergusson, and with one important exception, which must be considered an improvement, Prof. Hayter Lewis is generally in accord with De Vogüé's views on both these questions.

No ancient chronicler or geographer attributes the Dome of the Rock to Christian builders. The Moslem and the Christian accounts agree in making it a Muhammadan building. The inscriptions existing on its walls give it the same origin. It is unnoticed by any writer before the Moslem period, the oldest known accounts being that of El Mukaddasy in the tenth century (985 A.D.) with El Yakûbi's notice of its erection (874 A.D.) by 'Abd el Melek, the Damascus sultan, in the year 688 A.D. The earliest-known Christian writer on the subject is Eutychius, in 940 A.D. The inscriptions, which were first published by De Vogüé, include the important Cufic text in the interior, which gives the date of the erection of the *Kubbeh* as 72 of the Hegira, and the later texts of El Mamûn on the bronze of the outer doors, giving the date 216 of the Hegira (831 A.D.). To these has now been added an early date on the rafters, found by Dr. Chaplin in 1881, which corresponds to 913 A.D.

It may appear curious that in face of such evidence any question should remain; but it is indisputable that the pillars supporting the Dome of the Rock, and in its arcade surrounding the dome, are of Byzantine origin. De Vogüé pointed out that they were not in their original position, having been re-used by the Moslems (according to a very common Arab practice), and taken from some former building. In 1873 Major Conder made drawings of these pillars, which Professor Hayter Lewis reproduces (page 42) with the following remarks:—

"I may take the words of Capt. Conder (*Transactions*, Royal Institute of Architects, 1878-9, p. 36): 'Only those of the capitals under the dome are alike; the rest differ in size, in outline, and in details. One of the capitals is evidently placed on a shaft which did not originally belong to it, but which required a larger capital. The sixteen capitals in the screen are more uniform. Two of these capitals are, however, of entirely different design, and their shafts longer than the others. The original bases are now covered with marble flagging, but this was removed in 1874, and it was then found that they differed in outline and height, viz., from 4 in. to as much as 17 in.' With this description I [Professor Hayter Lewis] entirely agree, after very careful and repeated examinations on the spot."

With this detailed examination of the pillars the real prop of Mr. Fergusson's theory is cut away. It was from an inspection of Catherwood's drawings of the capitals that he formed the opinion that the building must be Byzantine, and until the re-use of older material had been demonstrated, the opinion not unnaturally commanded respect. Professor Hayter Lewis does full justice to Fergusson's ability in these words (p. 55):—

"I have pleasure in bearing testimony to the fact that in this, and in the other Jerusalem buildings, my esteemed friend Mr. Fergusson made the only serious mistakes which are to be found throughout the interesting and learned histories of ancient and mediæval architecture, for which we owe him so much."

The point in which an advance has been made on De Vogüé's work is one which was first brought forward by Major Conder ("Tent Work in Palestine," 1878), and which now receives the important confirmation of Professor Hayter Lewis's approval. The *Kubbet es Sitsileh*, or "Dome of the Chain," is a smaller building east of the Dome of the Rock. Muhammadan writers say that it was the model from which the Dome of the Rock was built. It resembles the latter except that the outer octagonal wall, including the two circles of pillars, does not exist in the smaller building. The question raised is whether this octagonal wall existed when the Dome of the Rock was first built by 'Abd el Melek. It has been pointed out that the dates on the gates and on the rafters belong to a period later by a century and a half than that recorded on

the arcade enclosed by the wall. The outer wall appears to be first mentioned in 903 A.D., and an earlier writer is quoted by Prof. Hayter Lewis, namely, El Yakûbi, in 874 B.C., who says that "'Abd el Melek built above the Sakhrâh" (or Holy Rock now shown within the Dome of the Rock) "a dome, and hung it round with curtains of brocade." There is no distinct mention in this of the outer wall. The question is one of secondary importance, but it appears quite possible that this outer wall was not part of the seventh century structure, but an addition by the later Khalif el Mamûn, in 831 A.D.

There is a question of some interest connected with this outer wall which, though it has elsewhere been discussed by Prof. Hayter Lewis, is not mentioned in the present volume. The outer walls are adorned by arcades, with a small upper balustrade, of which a drawing is given (p. 36), and which Prof. Hayter Lewis is inclined to attribute to the ninth century A.D. This arrangement should be compared to that of a very interesting building at Ammân, east of Jordan, which was fully described with detailed drawings by the Survey Party in 1881. The general style of the latter building connects it with the Sassanian architecture of Persia. There is evidence that the building existed in the tenth century A.D., and not only do the details of the architecture recall those of the Dome of the Rock, but the chased stone-work bas-reliefs present a general similarity to the mosaics of the Jerusalem building. The proportions of the little dwarf pillars, and their coupled arrangement, also recall features of the Jerusalem balustrade and its pillars; and the simple capitals are similar. This comparison strengthens Prof. Hayter Lewis's conclusion (p. 72), when he says:—"Finally, I must express my full belief that the Dome of the Rock was the work of the Arabs, designed for them by a Byzantine or Persian architect, and with Persian and Byzantine workmen, before the Arabs had developed any definite style of art of their own; and that it was built with the capitals, bases, and columns ready to hand, being derived from the remains of churches and other buildings, destroyed by Chosroes and other invaders."

The conclusion so reached is one which has been consistently maintained from time to time in the pages of the *Builder*; and which, being supported both by architectural opinion and by the discoveries of explorers and of antiquarian scholars, will, no doubt, survive as the settlement of a controversy which has been very thoroughly threshed out. When Mr. Fergusson first wrote, the subject was imperfectly understood. An unnecessary personal element crept into the controversy, from which the present volume, representing the opinion of a competent and impartial judge—is perfectly free; and the fact is simply, that a *prima facie* case failed to become established when the evidence was fully recorded.

That Prof. Hayter Lewis is correct in stating that the Dome of the Rock "never was a mosque, and that the name Mosque of Omar, by which it is commonly known, is misapplied," all who have studied the subject and who are familiar with mosques will agree. There is a very ancient mosque at Ammân, probably as old as the ninth century A.D., since all its arches are round, like those in the Dome of the Rock, and neither pointed nor "horseshoe." This building, and the great Mosque at Damascus which is of the same age, and of which we have here the plan (p. 69), present the same arrangement which may be observed in buildings of any Moslem age meant for Muhammadan worship. In such worship those who are performing the regular prayers stand side by side in line, with a fagleman (the Imâm) in front, opposite the *Mihrab* or prayer apse. Thus long rectangular buildings are suitable, and were erected save when a Christian basilica could be converted into a mosque, by making a *Mihrab* in the south wall. Evidently an octagonal building, with the centre filled up by the sacred rock over which the dome forms a permanent canopy, could not be used for regular prayers. There

are often, however, such *Kubbehs* or oratories in the precincts of mosques, as at Mecca or in Damascus, where the "Dome of the Books" stands in the courtyard of the great mosque. The Dome of the Rock was such an oratory. It is to be supposed, however, that Prof. Hayter Lewis is only quoting Mr. Fergusson's opinion when he says that the Dome of the Rock is "wanting the niche or *Mihrab*," p. 11. There are several *Mihrahs* in this building, the principal being in the south wall of the outer octagon, east of the south door. It is shown on the Ordnance Survey Plan reproduced in this volume, p. 31, and was, no doubt, seen by the author. It is specially curious, because it is flanked by two elaborate pilasters of Mediæval origin, which were adorned by small human heads on the capitals. The heads remain, but the features have been purposely defaced by the Moslems. Muhammadan pilgrims after walking round the Sacred Rock pray at this *Mihrab*, as part of their pilgrim duty.

There is another point which may be mentioned, though it is a detail not affecting the general principles on which the two main controversies are treated in the present work. In speaking of Sir Charles Warren's opinion, that the outer walls of the Great Haram are (as regards their base-courses) the work partly of Solomon, partly of Herod, Professor Hayter Lewis remarks (p. 5):—"It is no mere guess which assigns their foundation-courses at least to the age of Solomon." Evidently he refers to the discovery of rudely-painted letters on the foundation-courses at the south-east angle, which were among the most interesting of the results of those perilous and exhaustive excavations, by which Sir Charles Warren succeeded in substituting knowledge for opinion.

But neither he nor the present author would claim special knowledge as to the date of these letters. They were referred to the late Dr. Deutsch, who called them Phœnician—and the Phœnicians did use such mason's marks, as we know from the case of a wall at Eryx. When, however, this opinion was pronounced, on marks which are roughly shaped, our information as to the history of the native alphabet in Palestine was extremely meagre. It is now known that the forms of the letters used, down to the time of Herod, do not very materially differ from those of an earlier age. It is quite as probable that these marks were painted by the masons of Herod's age, as that they were scrawled in Solomon's time. They serve to show that the masonry is not later than Herod, but they are insufficient evidence of the work of Solomon. We do not know that the Phœnicians or the Hebrews at that age (or in any age before the Greek period) used what is called "drafted masonry." Our only examples in Palestine of this masonry belong to the Greek and to the Roman periods.

Nor is there any very cogent reason for supposing this splendid masonry at Jerusalem to belong to two periods separated by a thousand years. There are no important straight joints, no great difference in size, finish, or preservation of the stones. In some places, it is true, the stones have rough faces, but this is in the parts where they were not intended to be seen.

De Vogüé's opinion has been overlooked, according to which the walls (below the levels of the Byzantine restorations) all belong to one date, being entirely the work of Herod the Great. Josephus tells us not only that Herod enlarged the Temple enclosure (as noted by Professor Hayter Lewis), but also that "he took away the old foundations" (1 Wars. xxi. 1.). There is no evidence to show that we possess, at Jerusalem, a single stone of Solomon's Temple. The tooling of the stones (which is peculiar) is the same in all parts of the wall where the masonry was intended to be seen, and it is not very probable that Solomon and Herod would, not only have used stones of the same dimensions, but would, moreover, have used an adze of the same size and number of teeth to dress their stones.

As regards the Golden Gateway on the east wall of the Haram—a building clearly of



Roman origin, Professor Hayter Lewis is inclined to agree with De Vogüé as to its being of the age of Justinian (p. 96), and the work of a Byzantine architect.

As regards the Aksa Mosque, which occupies the south wall of the Haram, standing probably on the site of Justinian's Great Mary Church, Prof. Hayter Lewis's views are entirely original, and demand careful consideration. He believes the original Aksa to have been much larger than the present building. There is no doubt that the present building is also a structure in which Byzantine materials have been re-used by Arabs, while the north porch is twelfth-century Norman work, and the large building to the west appears also to have been built by the Templars, as described by Theodorici. A crusading apse has also been added on the present east wall, and the remains of piers, still traceable outside this wall towards the east, may prove to support Professor Hayter Lewis's view. He has, however, not called attention to the north door of the building, which De Vogüé believed to be Byzantine. El Mukuddasy's description unfortunately gives no measurements, and it is perhaps questionable whether from such an account a restoration can be made which will be generally accepted, in absence of existing remains to control our reading of the vague descriptions which we possess.

As regards the basilica built by Constantine, on the site of the present Cathedral of the Holy Sepulchre, we again have to depend chiefly on a non-scientific description by Eusebius. It has been variously understood, but Prof. Hayter Lewis concludes for a "plan of the hemisphere much as is suggested by De Vogüé and by Capt. Conder." If a comparison with Constantine's Bethlehem basilica is held to be of value, there can be little doubt that the Jerusalem basilica resembled, in plan, the countless chapels of the age scattered throughout Palestine, with a large apse to the east, a narthex to the west, and an open atrium on this side, outside the covered basilica.

The last two chapters of Professor Hayter Lewis's work have reference to recent discoveries concerning the probable site of Calvary, and the Siloam tunnel. The first refers to the curious knoll, outside the north gate of Jerusalem, which is, by Jewish tradition, identified with the place of execution before the destruction of the city. The idea that this was the probable site of Calvary is not very new; but the discovery of the Jewish tradition in question—which was made by Dr. Chaplin—was first published by Major Conder in 1878, and forms quite a new element in the question. Sir Charles Wilson, in a note, questions the continuity of Jewish tradition on the subject. The site, however, agrees well with the Talmudic account of the place of execution, and the Jewish tradition is at least as likely as any Christian tradition to be continuous, for we know of the presence of Jews at Jerusalem in all ages from the time of Christ; we can prove their residence in the second, third, fourth, tenth, and twelfth centuries; and the periods intervening are not those in which they are least likely to have inhabited the Holy City. This new identification of a site for Calvary "without the gate"—and not as is the ecclesiastical site, nearly in the middle of the town—was adopted by General Gordon during his stay in Palestine, and has become widely known to visitors. It may at least claim a great degree of probability, in the eyes of those who agree with Robinson in subjecting monkish traditions to severe critical examination before accepting them as evidence.

As regards the Siloam tunnel, it may be regretted that—even as a theoretical line—Prof. Hayter Lewis should show a second tunnel, independent of that which actually exists. No such additional tunnel has been found to be mentioned by any ancient writer; it was, in fact, invented by a theorist, whose views did not square with the fact of the existence of the real tunnel; and excavations in search of it failed entirely to recover any such channel. Being double printed in red it might with advantage be omitted in a future edition (see page 122).

A number of the illustrations which adorn these pages are taken, with due acknowledgment, from the "Jerusalem Volume" of the Palestine Exploration Fund Memoirs (written by Sir C. Warren and Major Conder), with a few from other publications of the same society. Prof. Hayter Lewis has, however, added several important plates, which are of great value for comparative purposes, especially those from the Spalato Palace (pp. 52 and 91) and the interesting drawing of the Dome of the Rock by Breydenbach in A.D. 1486 (p. 32). To those who wish for a summary of results, scattered through expensive volumes, these reproductions, with the new plates added, will be valuable, and they allow of independent judgment on the subjects thus ably set forth. It is to be hoped, however, that the diagram showing various views as to the walls of Jerusalem (p. 5) may hereafter be improved. It gives, for instance, an incorrect view of the junction of the Ophel wall, according to Sir C. Warren and Captain Conder. There is no difference of view between these two officers at this point, where actual discovery sets the matter at rest, and neither of the lines shown on the diagram is quite correct. The "so-called Tombs of the Kings" is also an unfortunate survival, as Robinson's identification of this monument with the Tomb of Helena of Adiabene, mentioned by Pausanias and Josephus, is accepted by all scholars.

Professor Hayter Lewis also gives a cut of a small pilaster in the church of St. Marie la Grande (p. 38), and suggests that it may have belonged to the original Hospice of Charlemagne on or near this spot. It is doubtful if this can be maintained. It appears rather to belong to the Crusading Church itself, one of the earliest built after the capture of the city by Godfrey.

The present work is valuable, therefore, not only on account of its containing a competent judgment on two much controverted questions, of high importance to the study of Syrian antiquity, but also as showing clearly the great advance that has been made in our scientific knowledge of the subject. When Fergusson and Robinson first engaged in controversy, the question was almost entirely literary. The sketches of Catherwood alone existed as evidence. The survey of the city was not commenced, the highly important "Siloam inscription" was unsuspected to lie hidden in its tunnel, the levels of the hills and valleys of the old city had not been measured, the detailed examination of buildings within the Haram had not become possible, the important excavations of Sir C. Warren were yet in the future. Those who now write on Jerusalem without having studied the results obtained from the last twenty years of exploration can no longer be considered competent to expound, on literary grounds, questions which have been settled by the architect and the engineer on the spot. The chief results have been the recovery of the existing walls of Herod's Temple enclosure; of the mighty Ophel wall joining its eastern cloister; the determination of the Dome of the Rock as an Arab building of the seventh and ninth centuries of our era; the generally-expressed consent to the site of Constantine's basilica having been where the Holy Tomb is now shown, together with many other important discoveries concerning the city in various ages, which are not mentioned in the volume before us, as having no connexion with its subject, but which may be studied in the "Jerusalem Volume," to which Prof. Hayter Lewis refers throughout with cordial approval.

**The Sanitary Institute.**—The first ordinary general meeting of this Institute was held on November 22, Sir Douglas Galton, F.R.S., in the chair. The Council reported the successful commencement of the Institute, nearly 500 Members and Associates had been enrolled, and the Institute had before it a large field of useful work. The Duke of Northumberland was elected President of the Institute, and Inspector-General R. Lawson, LL.D., was duly elected as treasurer of the Institute.

## NOTES.

**T**HE proposed new telegraphic communication with the Australasian Colonies, viz Canada, Vancouver Island, and the Pacific, has lately excited considerable interest. The Pacific Company are prepared to lay a new cable from Vancouver Island to Australia (touching Hawaii, Fiji, and New Zealand), and to effect great reductions in the through rates, provided the Government will guarantee traffic to the extent of 75,000,000 per annum. This is a very large sum compared with the present Government traffic; and, even allowing for the Canadian business, the amount would probably have to be considerably reduced before the scheme could be entertained by Parliament. On the 23rd ult. the Earl of Winchester presided over a meeting largely attended by Australian merchants and others, and explained that the proposed new cable would connect with strong, dependable existing lines, and form a more reliable connexion than we have at present, besides being very much cheaper; indeed, subject to the guarantee alluded to, he intimated that the tariff would be reduced from 9s. 8d. to 4s. a word. This, of course, is an enormous inducement to persons doing business with the Australasian colonies to support the scheme; and (equally of course) provokes strong opposition on the part of the existing lines. The committee of the Eastern Extension Company, whose line was established in 1871, say that the interruptions in their service have been due to exceptional circumstances,—volcanic disturbances, &c., and that the proposed line could not be certain of immunity from interruption any more than theirs. It is certainly a question as to which line could be most easily protected in the event of war, for, while the old route is admittedly accessible at many points, there is in the new route the long overland portion of the connexion to be considered. The promise of a reduction in the tariff brings from the Eastern Company a renewal of a proposition made by them a year or so back, which they consider would lead to the establishment of a cheaper rate on more favourable conditions than could be obtained in any other way. They suggest that the Imperial and Australian Governments should guarantee the Eastern and its associated Companies three-fourths of their present earnings, when they would be in a position to give the Colonial Governments full control over the tariffs. We should be very pleased if the agitation were to result in a reduction in the truly restrictive rates at present in force. The Pacific cable would involve an enormous outlay, and there would have to be a very great increase in the Australasian cable traffic to enable the Company to make the comparatively low charge of 4s. per word remunerative. Otherwise the venture would prove, as a pessimist correspondent once prophesied of the Manchester Ship Canal, "a great benefit to all concerned, with the somewhat important exception of the shareholders."

**T**HE case of Cooper v. Straker, recently decided by Mr. Justice Kay, appears to us much ado about nothing. It was an action for the infringement of the light of a wool warehouse, and the defence was that actual enjoyment of the light within the meaning of the Prescription Act had not existed for the statutory period, because the windows were seldom opened, and were usually kept closed up with iron shutters. The judge held that there had been a sufficient enjoyment to give the plaintiffs the right to the light. It seems to be clear that, so long as there is an opening in the nature of a window, and so long as the light is allowed to pass through from time to time, the fact that for considerable periods shutters are put up can make no possible difference. If it were otherwise, we should find persons losing their right to light because they were out of town for the summer, and their shutters had been up from August to October.



THE Archaeological Society of Athens have at last decided to satisfy the long-rouned curiosity of all classical students as to the extraordinary paintings reported to have been found in the early palace at the top of the Mycenae hill. In the last issue of the *Ephemeris Archaeologica* (dated 1887, part 4), which has just appeared, a coloured facsimile of the most important fragments is given, with descriptive text by the discoverer, M. Tzountas. The bulk of the designs are made up of vegetable and geometrical motives, with a great deal of spiral work, but the human element is not wholly absent. The greatest interest will, however, be aroused by the fragment depicting three ass-headed monsters carrying a pole. The colours used are blue, two shades of brown, and red. However interesting the technique, it is the form of these monsters that is of paramount importance. Unquestionably they bear a close resemblance to the monsters depicted on the "island's gems," published and discussed by Milchhofer. Dr. Milchhofer described his monsters as horse-headed. The Mycenae monsters are, undoubtedly, according to M. Tzountas, ass-headed. It will probably turn out that the heads of the monsters on the "island stones" have been wrongly identified, owing to their small size and indistinct cutting. On one of the seven island stones discussed, the monster is carrying a pole, from the ends of which hang the dead bodies of wild animals he has killed. Unfortunately, in the case of the Mycenae paintings, the heads of the pole which the three monsters are carrying are missing, but there is a high probability that they carried game. Surely here we have the prototype of the game-carrying Centaur, and, we may conjecturally add of the Herakles carrying the Kerkopes. Moreover, we have, what is even more important, an undeniable link in the chain of evidence that connects the art of the ancient East and West.

IT is satisfactory to learn that the Forth Bridge has passed through the stress of the recent high gales without the slightest trace of injury or sign of weakness. The greatest wind pressure occurred on Friday, the 16th ult., when 27 lbs. per square foot was recorded on a large board of 300 square feet in area, while 41 lbs. and 35 lbs. respectively were recorded on two smaller boards of 13 ft. square, all being on the Island of Inchgarvie. An average pressure of 32 lbs. per square foot was registered at the other portions of the bridge. Actually a wind pressure of 56 lbs. has been provided for in the design. Between the two cantilever end piers there is the enormous total pressure of 8,000 tons allowed for wind alone. It is satisfactory also to learn that not one of the 100 cranes which are perched about over the structure sustained the slightest injury.

A REPORT of a somewhat curious case under the Metropolitan Building Act reaches us. It seems that Mr. Henry Jarvis, District Surveyor for Camberwell, summoned a Mr. Owens, of Manchester, before Mr. Biron, sitting at the Lambeth Police-court, on the 20th ult., for having set up under a large canvas booth (used as an auction-room) a wooden structure of a movable or temporary character, without a licence from the Board, as required by the Metropolitan Management and Building Acts (Amendment Act), 1882, 45 Vict., ch. 14, sec. 13. The structure consisted of a wooden platform, formed of flaps, partly hung to the framework of a van, and supported in front and underneath by eighteen wooden posts about 3 ft. 9 in. high, resting on the ground. This platform extended 5 ft. beyond the van at either end, and had a movable sloping roof of wood, supported in front by six wooden uprights. It was urged in defence by Mr. Owens' solicitor that the so-called structure was simply a portion of the van, and could not be considered a movable structure as contemplated by the Act. After hearing the evidence the magistrate adjourned the case in order that he might view the structure. At the adjourned hearing the magistrate gave his decision, and said the

defendant ought to have obtained a licence, and he fined him 1*l.* and 2*s.* 4*s.* costs.

A PROJECT for another ship canal is mooted. A correspondent of the *Times*, in calling attention to the scheme, says:—"The little peninsula of Wirral, which lies between the estuaries of the Mersey and Dee, has at all times been a favourite spot with the promoters of ship canals. A map, dated 1811, and headed 'The Proposed Manchester Ship Canal,' shows an extension of the Ellesmere Canal from its original outlet at Ellesmere Port to Tranmere Pool—a scheme which is now being carried out, save that the entrance is placed at Eastham, 5 miles higher up the river. The silting-up of the Dee, which resulted from the formation of the new cut and the reclamation of the upper bed of the river, gave rise to many projects for a canal from Chester, through Wirral, to Thurston or Dawpool, and attempts were made in 1837 to form a company to carry out Sir John Rennie's plans. A more feasible idea was that of cutting through the low-lying plain of Leasowe to form a direct channel from the Irish Sea through Wallasey Pool, then a natural tidal harbour, to the Mersey, thus obviating the risks and delays caused by the sandbanks at the entrance to the Mersey; and in 1838 Telford, Robert Stephenson, and Nimmo made surveys and issued an elaborate report, estimating the cost at 1,400,000*l.* As this was too large a sum for the promoters, among whom were Lord Clive, Sir Henry Parnell, Sir John Tobin, and Mr. William Laird, a further report was issued, in which it was shown that the principal features of the plan could be carried out for half the money. The scheme was frustrated by the Corporation of Liverpool, who privately bought up the land on each side of Wallasey Pool. It is now proposed to carry it out." In its salient features, the plan now proposed for execution is described as being mainly a reconstruction of Telford's scheme, and it appears to be quite practicable. The project, if carried out, is likely to be of great benefit to Birkenhead.

THE Cantor lectures on metal alloys, recently delivered by Professor Chandler Roberts-Austin, seem to introduce us into a realm governed by the most occult laws. With the lectures as a series we are not now concerned. We merely note a few of the marvellous facts relating to the influence which minute percentages of foreign bodies exercise on the metals. Those who have studied the effects which the metalloids have upon iron and steel, and who are familiar with the almost infinite series of alloys of copper, tin, lead, and zinc, have often wondered how minute differences in relative proportions affect most characteristically their resulting physical properties. Professor Roberts-Austin has performed many experiments, which go to prove that similar effects occur with alloys of metals generally. Thus, pure gold has a tenacity of seven tons to the square inch. Alloyed with copper in the proportion of nine parts to the hundred, its tenacity is increased to eighteen tons per square inch. But if to this alloy there is added one two-thousandth part of its mass of lead, the tenacity is reduced to five tons, and the golden colour is changed to an orange-brown. Pure bismuth crystallises in broad mirror-like planes, and reflects light, but the addition of the one two-thousandth part of tellurium thereto produces a minutely crystalline structure, which scatters the light. One - thousandth part of antimony suffices to change best selected copper into the worst conceivable. Mr. Preece's remark is cited,—that a cable made of the purer and better conducting copper now manufactured will carry twice as many messages as cables of the less pure metal made in 1858. Again, two-tenths per cent., by weight, of carbon introduced into iron produces a material suitable for bridges and boilers, but a sword made of this material would bend. An addition of eight-tenths per cent. of carbon is necessary for a razor, but

this material would be useless for a bridge or rail. The numerous facts, of which these are typical, are not to be explained by the formation of ordinary chemical compounds, based on combining weights. Mr. Austin attempts to connect them with the Periodic law of the elements. Those elements whose atomic volumes are more nearly identical form, by their union, the least fragile compounds, and *vice versa*. Could such a law be established, much of the tentative work of the practical metallurgist might ultimately be saved.

WE extract the following from a report by Mr. Spear to the Local Government Board (dated October 26 of this year) on an outbreak of diphtheria in the Dingestow Registration Sub-district of the Monmouth Rural Sanitary District:—

"The cottages are generally very small, and in many cases are in a bad state of repair. The stone or brick floors, and the walls, show obvious signs of dampness, and where the floors are boarded the wood is often laid upon the bare earth. Surface paving and drainage around the cottages are generally wanting, so that a sodden condition of surroundings is the rule. Sewage is allowed to make pools in the vicinity of the dwelling, or to flow into some watercourse, often silted up and stagnant, close by; and, where animals are kept, the close proximity of cow-sheds, pigsties, &c., and the absence of proper drainage, lead to much additional offensiveness. Privy accommodation is of the roughest and most primitive description, but is generally provided at some distance from the dwelling. Water is commonly obtained from some spring, or "runner," in a neighbouring field or woodland fairly removed from habitations; occasionally from wells sunk in sewage-sodden earth. In dry summers many of the sources, it is said, fail."

Mr. Spear also comments on the luxuriant growth of trees in close proximity to many of the little hamlets, and in winter the condition of the by-roads which lead to many of the cottages as further conducing to the ills which arise from damp habitations and sites. He adds, at the conclusion of his report, speaking of the district generally, besides the places which have specially suffered from disease:—

"An enormous amount of sanitary work, that, from the circumstances of the scattered population, can in most cases only be carried out in small instalments and in detail, is required; the population, moreover, is of the kind that needs close supervision, and the sanitary authority should consider whether, with the very wide area, comprising some 83,000 acres, under their jurisdiction, the services of a single inspector of nuisances is sufficient. To me it seems that more constant supervision, and a more minute application to the work of improvement were required." I may specially refer to the villages of Skenith, Lydbrook, Whitecroft, Yorkley, and Ragland, as amongst those to which attention of the kind I have spoken of is specially needed."

A NEW method of enriching ordinary burning gas has lately been introduced into this country from America. The gas treated by this process is known as the Lawrence Carburetted gas, and a company has been formed under the style of the Lawrence Automatic Gas Company (Limited), in order to work the invention commercially in this country. The following is briefly the method of operation. There is a rectangular receptacle, which, of course, varies with the number of lights on the installation. An example we lately inspected at the offices of the company is roughly about 2 ft. cube, and is intended for a medium-sized mill or factory. In this are perforated trays, upon which wood shavings are laid. Above the trays is a reservoir into which gasoline is introduced, and this gradually trickles down, whilst the gas ascends amongst the trays and through the shavings, and is thereby enriched by contact with the gasoline. The flow of the liquid is regulated by a ball-cock which comes into action, and shuts off the supply when a given amount has collected in the bottom of the receptacle. There is a water-seal at the top to prevent escape of vapour. No external heat is used, and in this respect the system differs, we believe, from some others of a somewhat different nature. We witnessed, a few days ago, some tests made with the apparatus, but no photometric apparatus being available, we are unable to give precise figures from our own observation. There can



be no doubt, however, that a vast improvement takes place in the illuminating power of the gas when the apparatus is applied. Dr. John Hopkinson, F.R.S., has reported to the company on the system. The following are given by him as the mean results of a large number of experiments. From his figures it would seem that a Bray No. 6 burner, using Lawrence gas, compares very favourably with the Bray No. 6, burning ordinary, or City, gas, the economy amounting to 40 per cent. Dr. Hopkinson also states that for the same illuminating power the heat and the products of combustion will be much less, and, consequently, the damage to decorations and health will be less than when ordinary gas is consumed. In short, Dr. Hopkinson states "the Lawrence gas realises all the advantages of paraffin lamps with the convenience of ordinary gas." Mr. A. M. Levy has also published some tests he has made with this gas, and comes to the following conclusions:—1. That the illuminating power of Lawrence gas is  $8\frac{1}{2}$  times that of ordinary gas. 2. That for every foot of gas carburetted eight-tenths of an ounce of gasoline are evaporated. This quantity is reducible. 3. The saving realised, candle-power for candle-power, will vary 45 to 60 per cent. gross of the cost of illumination by City gas. 4. The Lawrence gas is less injurious to health and property than ordinary City gas. These are all valuable characteristics, and seem to point to a brilliant future for the Lawrence gas; but it of course remains to be seen how far they may be counterbalanced,—if at all,—by drawbacks which may arise in the course of practical work. The chief difficulty in systems of illumination of this character is that the carburetted apparatus is apt to clog after a time, and that trouble arises through deposition if the gas has to be carried far in the pipes after it has been enriched. It is but right to state, however, that the Lawrence system differs in essential details from those in which these difficulties have arisen. Several installations have already been made, and are said to be giving very good results. The system has been largely applied in the United States.

IN reference to an advertisement which appeared on the front page of last week's *Builder*, referring to the Royal Institute of Architects' Examination in Liverpool, to be held in February, 1889, we are asked to say that the Liverpool Architectural Society, having arranged with the Institute to hold the Examination in that city, are very desirous to make it a success. A special arrangement (subject to the names being submitted) has been made with the Liverpool Free Library for candidates to have access to the numerous architectural works there, and the Liverpool Society are prepared to offer extra facilities for the use of their own library. Professor Hele Shaw, of the Victoria University, Liverpool, has most cordially expressed his willingness to deliver a course of, say, six lectures, on "Materials" and "Strength of Materials," provided the hon. sec. for the Examination, Mr. Alfred Culshaw, can furnish him with the names of ten or more candidates who would attend. The fees for the course will be merely nominal. The proposed course of lectures will be as follows:—1. The Properties and Preservation of Timber; 2. Iron and Steel. 3. Natural and Artificial Stones and Cement; 4. The Strength of Beams; 5. Riveted Girders. 6. Iron Roof Trusses.

**The Geology of the London District.**—Prof. H. G. Seeley, F.R.S., is about to deliver a course of lectures on the practical study of the geology of the country round London. This course is given at the request of students of the London Geological Field Class, and information concerning it may be obtained from Mr. William Dunn, 21, King William-street, Strand, W.C.

**News-vendors' Benevolent and Provident Institution.**—Mr. Edward L. Lawson, of the *Daily Telegraph*, will early in the coming year preside at the jubilee festival of this institution.

## LETTER FROM PARIS.

A SERIOUS accident,—which has, however, been exaggerated by the newspapers,—happened in the Exhibition works a few days ago, when the pier to the right of the entrance to the Palais des Arts Libéraux, came down, bringing a quantity of masonry down with it. The precise responsibility for the accident is not yet determined. Otherwise, the various pavilions may now be considered finished, and the Eiffel Tower is now up to two-thirds of its height. Independently of the main pavilions, there are some subsidiary erections being raised in the Champ de Mars, of which the most important are the pavilion of the Société des Téléphones, designed by M. Ducasseau; that of the gas companies, by M. Henri Picq; the "Théâtre des Folies Parisiennes," designed by M. Masson; the palace of the Principality of Monaco, flanked by turrets, and with an immense greenhouse to it, designed by M. Janty; and the pavilions of Pastellists and Water-colour Artists, designed respectively by M. Harmant and M. Escallier.

Committees are still in process of organisation for dealing with various special and technical subjects in the Exhibition. Among these is the recently-appointed committee of the retrospective or historical exhibition of fine arts. It includes M. Kaempfen, the Director of the National Museum, MM. Etienne Arago, Gosselin, Lafenestre, Saglio, Courajod, Guillaume, Paul Mantz, Jean Gigoux, De Chennevière, Bonnat, and Marquet. The committee will appeal to the leading French and foreign amateurs and collectors of works of art, from whom about sixty will be chosen to form a committee of organisation, which will probably have a difficult task before it in overcoming the natural dislike of owners to part for a time with their most valued examples of art.

The design for the diploma which will be given to prize-winners in the exhibition is the subject of a competition in which about 150 artists have taken part. After long consideration, the jury have chosen the designs of MM. Louis Bonnier (architect), Henri Danger, Daniel Dupuis, Georges Duval, Victor Galland, and Michel Langon, who will have to enter into a final competition. The designs are, it must be confessed, a very feeble set, and the Government might as well have gone to a recognised master in design at once, as in the case of the diploma of the 1878 Exhibition, which was entrusted to Baudry. It is to be feared that, in spite of this mania for competition, the diploma for 1889 will not be worthy of the occasion.

As we have already mentioned, the inauguration of Dalou's monumental group, "Le Triomphe de la République," will take place in the coming year, on the day of the National Fête, and the programme of this ceremony is already under consideration. The group, of which the *Builder* published an illustration two years ago, will be erected in the centre of the basin of the Place de la Nation, raised on three large steps; and as the principal motif of the composition will not lend itself to treatment as a fountain, it will be supplemented by figures of Naiads and Tritons rising from the water and directing their jets of water, as in the Neptune Fountain at Versailles, towards the monument as a centre. The sum necessary thus to "complete" the work is estimated at about 230,000 fr. Dalou's composition has been criticised lately as being too like a magnified "centre-piece," and the proposed treatment will not make it less so; but, as sculpture, it is one of the most masterly productions of French art in this century.

The model of a veritable centrepiece of unusual scale and importance has been exhibited at the Hôtel de Ville; it is a work proposed to be executed by the Maison Christofle for the Municipal banquets. The principal piece has a plateau 4½ metres long; in the centre is the Genius of the Republic, an olive-bough in her hand, as protectress of the City of Paris, which is supported by four figures representing "L'Invention," "Le Goût," "L'Adresse," and "La Force." On the pedestal, four groups symbolise "L'Instruction," "L'Assistance Publique," "Les Travaux," and "La Sécurité." The side-pieces are formed by two plateaux of 3 metres in length, in the centre of which are placed allegorical figures of the Seine and the Marne, supported by figures signifying river-side industries in the past and present (boatmen, fishermen, rowers, &c.). In addition to this purely decorative work, there are four flower-baskets, ornamented with figures symbolising the arts of metal-working, masonry, carpentry, pottery, glass-blowing,

weaving, and paper-making. Then come four porcelain vases, ornamented with the attributes of the sciences, the arts, commerce, and industry. Twenty-four candelabra of very fine design, and 134 pieces of dessert service, complete the magnificent set, which has been designed by some of our most eminent sculptors, and which forms a remarkably rich and artistic ensemble, certainly superior to most of the work which the municipality has obtained in its numerous competitions.

Another competition with a poor result has been that for the Danton Monument, the first competition for which has been settled by the selection of the designs of MM. Desca, Lavasseur, and Anguste, Paris, who will compete for the final selection. M. Desca's design is the only one that is above commonplace, and the other two would seem to have been selected with the view of giving him an easy victory. There is to be a competition also for the decoration, by painting, of the Mairie of the XIVth Arrondissement, which is also to have the addition of a marble bust of "La République," to be executed by M. Blanchard. The Mairie at Lilas, of which the *Builder* gave an illustration on March 3 last, has escaped the competition mania, and is to be decorated with tapestries to be executed by MM. Bramet and Vimont. This Mairie will also have its "République" bust by M. Mathurin-Moreau. The architect of the Mairie at Lilas, M. Héneux, has been chosen in competition to build a new Mairie on the wooded heights of Meudon, above Paris, and another new suburban Mairie is just inaugurated at Charenton. This latter is, in fact, a transformation of an ancient chateau of "La belle Gabrielle"; and the architect, M. Graveaux, has succeeded very well in adapting an ancient building to modern uses without destroying its historic character.

The pedestal for the statue of Rousseau has been prepared in the Place du Panthéon—a very simple design in red granite by M. Formigé. It is quadrangular, on a plinth also of red marble, and on the face is engraved the inscription—

JEAN JACQUES ROUSSEAU.  
28 juin, 1712—3 juillet, 1778.

A small wrought-iron grille surrounds the monument, which will shortly be inaugurated. In a few weeks there will also be inaugurated in the court of the Observatory the fine statue of Leverrier, by Chapu, which is already on its pedestal. The "Société des Gens de Lettres" has commissioned the same sculptor to execute a statue of Balzac, to be erected in Paris, and for which the State will be asked to give a site in the garden of the Palais Royal.

The "Institut Pasteur," which has just been solemnly inaugurated, has been built in the Rue Dutot, from the designs of M. Vaugrand. It is a large building of very simple design, which has, however, cost (including the site) nearly two million francs. It contains a series of large laboratories, theatres, lecture-rooms, &c., and has been very well planned for its purpose.

The municipality are continuing the restoration, by artisans from the Gobelins and Aubusson manufactories, of their splendid collection of ancient tapestries, which will be shortly exhibited to the public in the new museum at Auteuil.

In connexion with this subject, we may mention the recent publication of a large and learned work on the "Manufactures Nationales" of France, giving information which will be new to most readers in regard to the organisation of French manufactures. The book is the joint production of M. Henry Havard, member of the Conseil Supérieur des Beaux Arts, and M. Marius Vachon, well known as a critical writer on Art. The history of the Gobelins, the Savonnerie, the Sévres manufacture, and others, has never yet been written, so that the authors have done a real service to the history of French art by their book, which comes very appropriately on the eve of the Exhibition, and gives an immense amount of curious information as to the past practice of various art manufactures in France.

Besides the "Blanc et Noir" Exhibition, there are at present open in Paris two "Expositions Particulières," one in the Georges Petit Gallery of contemporary French artists, which includes, however, only second-rate work; the other at the gallery of M. Durand Ruel, consisting of a series of works by a Russian artist, M. Makowsky, who has considerable reputation at St. Petersburg. With the exception of one historical painting, "The Death of Ivan the Terrible," these works show a practised hand rather than any power of invention or imagination. As



exhibition of the works of Perrin, who, however, was rather a poet than a painter, is to take place shortly, and after that an exhibition of the works of Barye, the great animal sculptor, which is in preparation by a Committee directed by M. Bonnat and M. Guillaume. This will be held at the Ecole des Beaux Arts, and will include the proofs *à cire perdue* of the master's principal bronzes, as well as a number of the fine studies in crayon and water-colour which he used to compose before modelling a subject.\*

The Académie des Beaux Arts has elected M. Gustave Moreau as a member in the Section of Painting, to fill the vacancy left by the death of Gustave Boulanger. M. Moreau, elected by nineteen to twelve votes, was one of five candidates, the others being Jules Lefebvre, Jean Paul Laurens, Émile Lévy, and Henner.† M. Moreau, who was born in Paris in 1826, is little known to the general public. He is a painter of severe style, who works on his own line, without troubling himself about public or press renown. It is with great pleasure that we record the well-merited success of this conscientious and learned painter, to whom we owe some works in a very perfect style, such as the "Orphée décliné par les Ménades," in the Luxembourg Museum. In the section of engraving M. Blanchard has been elected to fill the place of the late M. François. M. Blanchard is also a native of Paris, and has received medals in the *Salon* of 1843 and in several years since, as well as medals at the Universal Exhibitions of 1867 and 1878. The *Journal Officiel* announces the appointment of M. Bonnat as chef d'atelier at the Ecole des Beaux Arts, in place of Boulanger; an excellent choice in every respect.

We are still occupied about the rebuilding of the Opéra Comique. In a letter addressed to the Minister of Fine Arts, the "Société des Architectes Diplômés par le Gouvernement" has asked for a competition to be opened, as the readiest means of coming to a solution of the question. This is also the advice of the official reporter, M. Steenackers; but the differences between the Government and the Administration des Bâtimens Civils seem likely to spin out the question for ever.

We have had a good many losses in the artistic world during the past month. Among architects, we have to record the death of M. François Rolland, one of the founders of the Société Centrale; that of M. Edmond Mefre, member of the Société Archéologique, to whom we owe some important works in the provinces, especially the building of various châteaux in Touraine; that of M. J. Michel Dominique, Diocesan Architect and Inspecteur des "Monuments Historiques"; and that of M. Lucien Douillard, architect to the Government, who aided in the restoration of a great many ancient buildings, especially the église Ste. Croix at Orléans, and the château de Beauncy. We have also to record the death of the decorative painter, M. Paul Rey, to whom we owe the interior ornamentation of the synagogue in the rue de la Victoire, that of the foyer of the Théâtre Lyrique, and that of a portion of the Hôtel Paiva, celebrated otherwise for the paintings of Baudry which it contains. In sculpture we have lost two talented artists, Auguste Lechesne, who has died at his native town of Caen, at the age of 73, and Charles Marie Degeorge, a pupil of Duret, Hippolyte Flandrin, and Joffroy, who has died in the full vigour of life and talent, just after the completion of his two new marble statues for the Hôtel de Ville. He obtained the Prix de Rome in 1866. He was the author of the monumental fountain erected at Lyons in honour of Hippolyte Flandrin, and of the spirited bust of Renault which crowns the well-known monument to that artist at the Ecole des Beaux Arts.

**Obituary.**—The death is recorded of Herr Franz Schmidt, the City Architect and Chief Engineer of Pesth, well known for his meritorious services in reconstructing the Hungarian capital. He shot himself in consequence of a nervous affliction. The deceased was a Freemason, member of the Municipal Council, President of the local School Board, and one of the leading men of the Academy of Music, and the Choral Union of Buda-Pesth.

\* This ought to be an exhibition of great interest. Compositions of few pieces in England, even now, are aware of the power and grandeur of Barye's genius. He might be called the Michelangelo of animal sculpture.—Ed.

† The passing over of both Lefebvre and Henner will excite a curious and rather inexplicable result to English readers, to whom the name of Moreau is certainly much less familiar.—Ed.

## THE ANNUAL REPORT OF THE LOCAL GOVERNMENT BOARD.

### LONDON WATER SUPPLY.

THE "Seventeenth Annual Report of the Local Government Board, 1887-88," just issued,\* will be looked at with additional interest just now, in view of the new Local Government Act, shortly to take effect. As in previous issues, it is divided into three sections, viz., I. "Relief of the Poor and the Poor Rate"; II. "Local Government and Public Health"; and III. "Local Taxation and Valuation." The large number of appendices which supplement the Report, and which cover nearly three times as many pages as that document, contain a great deal of useful matter interesting to all who are concerned in successful local government,—and who is not? The report is dated "June, 1888," but it must not be inferred from this that the voluminous information it embodies is all brought down to that date.

Looking at the first section of the report, that, viz., dealing with the relief of the poor and the incidence of the poor-rate, we find it recorded that on the 1st of January last the total number of paupers of all classes in England and Wales in receipt of relief was 831,353, of whom 206,134 were indoor and 625,067 out-door paupers, while 152 received both in-door and out-door relief. As compared with the state of pauperism on the 1st of January, 1887, these figures show an increase of 4,536 in-door and 4,550 out-door paupers, and an increase of 52 in the number receiving both in-door and out-door relief. The increase on the total number of paupers was thus 9,138, or 1.1 per cent. The only divisions in which there was a decrease of pauperism on the 1st of January last, as compared with the 1st of January, 1887, were the North-Western, South-Western, West Midland, and Welsh Divisions. In the first of these the decrease was 3.3 per cent., whilst in the other divisions mentioned the decrease was less than 1 per cent. The largest increase, we regret to observe, took place in the metropolis, where it amounted to 6,509, or 5.9 per cent. In the other Poor-law divisions of the country, the increase ranged from 3.9 per cent. in the North Midland to 0.2 per cent. in the York Division. "The population of England and Wales," says the Report, "as estimated by the Registrar-General, was 27,870,586 in the middle of the year 1886, and 28,247,151 in the middle of 1887. Taking these figures as the basis of calculation for the purpose of ascertaining the proportion to the population of the paupers relieved on the 1st of January of the two years 1887 and 1888, respectively, it appears that the total number of paupers on each occasion amounted approximately to 1 in every 34 persons, being about 3 per cent. of the population." Of the adult male and female paupers, by far the larger proportion, viz., 141,232 males, and 231,673 females, were not able-bodied, while those classed as able-bodied in the returns included a large number who were temporarily disabled. Summaries of the reports made to the Local Government Board by its "General Inspectors" are given in the text of the report, but they are given *in extenso* in an appendix. One of the inspectors, Mr. Henley, states that the hope expressed in his last annual report, that the prospects of the working classes in Lancashire were brightening, has not been disappointed. For about two months in the summer (of last year) it was found desirable to work short time in the Manchester cotton trade, and for nearly six months from the middle of May [1887], a strike in the Bolton iron trade is estimated to have affected nearly 2,000 hands, and to have caused a loss of 50,000*l.* in wages; but these interruptions to labour, Mr. Henley reports, caused no perceptible increase in the pauperism of the district. As to the expenditure for Poor-law purposes, the returns included in the report only come down to March 25, 1887. For the year ending with that date, the total expenditure was 8,176,768*l.*, or an average charge of 5*s.* 10*d.* per head on the estimated population, being 2*d.* per head less than in the preceding year, and an average rate of 1*s.* 1*d.* in the pound on the rateable value of the property liable to contribute to the Poor-rate. In not one of the preceding twenty-five years, we are informed by the Report, has the average charge per head of the expenditure been less, and in every previous year for which we have statistics the average rate in the pound on the rateable value has been higher.

\* London: Printed for Her Majesty's Stationery Office, by Eyre & Spottiswoode.

Turning now to the second section of the report, that relating to "Local Government and Public Health," we learn that since the constitution of the Board on its present basis in 1871, the Board has sanctioned loans to Urban and Rural Sanitary Authorities to the amount of 38,825,093*l.* By far the greater proportion of these loans has been sanctioned for the purpose of sanitary improvements in Urban Districts, to be executed under the provisions of the Sanitary Acts, the Public Health Act, 1875, and local Acts and Provisional Orders. In 1887, the loans sanctioned amounted to 2,103,026*l.*, which included 1,822,499*l.* to be expended on sanitary works in Urban Districts, 180,577*l.* in respect of sanitary improvements in Rural Districts, and 100,000*l.* for expenditure under the Artisans and Labourers' Dwellings Improvement Act, 1875. In addition to these amounts, sanction has been given to loans to joint boards, in respect of schemes of sewerage and sewage disposal, the provision of hospitals, cemeteries, &c., to the amount of 171,235*l.* during the year 1887, making the total of loans sanctioned to joint boards since 1875 1,121,519*l.* Sanction has also been given during the year to the borrowing of 39,000*l.* by Commissioners of Baths and Wash-houses in the Metropolis, 19,135*l.* by Library Authorities, and 900*l.* by a Port Sanitary Authority. The loans sanctioned to Urban Sanitary Authorities during the year for works of water-supply amounted to 174,687*l.*, while for sewerage works and sewage disposal the same Authorities received sanction to borrow 413,185*l.* Loans to Rural Sanitary Authorities were sanctioned as follows, viz., water supply, 33,265*l.*; sewerage and sewage disposal, 119,822*l.* The various "Orders" made by the Board during the year having been enumerated, mention is made of the 529 inquiries held by the Board's Engineering Inspectors, and the Report goes on to mention new legislative measures affecting Sanitary Authorities. These include the Local Government (Boundaries) Act, 1887, the Local Authorities (Expenses) Act, 1887, the Allotments Act, 1887, the Open Spaces Act, 1887, the Public Libraries Acts Amendment Act, 1887, the Quarry (Fencing) Act, 1887, the Public Works Loans Act, 1887, and the Water Companies (Regulation of Powers) Act, 1887, which prohibits the water companies to which it applies from cutting-off, for non-payment of water-rate, the water supply from any dwelling-house or part of a dwelling-house occupied as a separate tenement, in respect of which the owner and not the occupier is liable by law or by agreement with the water company to the payment of the water-rate. This Act applies to every water company which is a trading company supplying water for profit, and to which any of the provisions of the Waterworks Clauses Act, 1847, have been or are hereafter made applicable by any special Act or Provisional Order confirmed by Parliament. After describing the action of the Board with regard to private Bills, as to offences against the Rivers Pollution Prevention Act, 1876, and as to the provisions of the Artisans and Labourers' Dwellings Improvement Act, 1875, the Report mentions that the Board confirmed during the year 424 series of By-laws framed under the Public Health Act (1875) and the Acts incorporated therewith. The Board also gave attention to 301 series of regulations made by various Sanitary Authorities under the Dairies, Cowsheds, and Milkshops Amending Order of 1886. The inspection of canal-boats, under the Canal Boats Acts, the adulteration of food and drink, and action under the Alkali, &c., Works Regulation Act, are the next subjects passed in review by the report. In regard to the last-named subject, it is stated that "deposits of alkali waste continue to be a source of complaint, particularly at Widnes, where they are already of enormous extent, and where they receive additions of something like 1,000 tons a day." "Certain processes, however," it is added, "seem to be gaining ground for treating the waste before deposit, so as to extract from it the sulphur which is at the same time its most noxious and its most valuable constituent. If these come into use a serious difficulty will be obviated."

A very important part of this second section of the Report is that referring to the water-supply of the metropolis. The reports of the examiner under the Metropolis Water Act, 1871 (Major-General A. de C. Scott, R.E.), and of the analyst (Professor Frankland, F.R.S.), on the water supplied by the eight Metropolitan Companies in 1887, are given in an appendix. These reports show with what success the companies have coped during the year with the



increasingly difficult task of supplying a huge and growing population with water from an area constantly exposed to fresh pollutions." Professor Frankland states that the water from both the Thames and Lea, as supplied to consumers in 1887, contained a smaller average amount of organic matter than in any year since the present system of analysis was begun in 1868. "This result is no doubt in great part due," says the Report, "to the fact that the aggregate rainfall of 1887 was exceedingly small, and especially to the almost entire absence of floods. The river-water, therefore, instead of receiving a large amount of decaying vegetation, of the washings from manured fields, and, as often happens in times of flood, of the overflows of cesspools and the soakings of other accumulations of filth, was mainly derived from springs, and had thus undergone a process of natural filtration."

A serious note of warning as to the possible inadequacy of the metropolitan water supply at no distant date is suggested by the report of General Scott. Referring to this, the Report of the Board says:—

"With regard to the quantity of water now supplied, and in future available for distribution by the respective companies, General Scott's report furnishes some interesting particulars. Of the eight companies, the Chelsea, the Grand Junction, the Lambeth, the Southwark & Vauxhall, and the West Middlesex, derive their water from the Thames. The New River Company takes its supply from the River Lea, near Ware, from Chadwell Spring, and from wells in the Lea Valley; the East London Company has its chief intake in the Lea at Chingford, has two wells sunk into the chalk in the Lea Valley, and supplements the supply from these sources with Thames water obtained at Sunbury; while the Kent Company relies exclusively on wells sunk into the chalk. Together, these companies supply a population of about five-and-a-half millions, of whom rather over two millions and a-half are within the New River and East London districts. Roughly speaking, rather over half the whole supply is from the Thames, about one-third from the Lea, and one-eighth from springs, wells, and ponds. The average daily supply for domestic purposes in 1887 was 131,041,471 gallons, being rather over 24 gallons per head of the population. For non-domestic purposes (e.g. for manufactories, street watering, &c.) the daily amount was 22,760,471 gallons. In 1887, 104,504 more persons were supplied than in 1886, and of these, nearly one-third were in the district of the East London Company. Having regard to the steady increase in the demand, it becomes a matter for serious consideration whether this company, without extensive additions to its present supply, will be able to meet the requirements of its district in the course of a few years, in the event of there being any long-continued droughts. General Scott thinks it possible that in 1892, assuming the summer to be hot and dry, the company may be called upon to supply a maximum of no less than 52,000,000 gallons a day, of which they are authorised to take only 10,000,000 from the Thames, and he points out that in the dry summer and autumn of 1874 it was estimated that the flow of water at Fields's Weir, in the Lea, above the intake of the Company, was only between 15,000,000 and 16,000,000 gallons daily. If a similar scarcity should recur, it seems very doubtful whether the Company, though it has very large reservoirs, would be able, without resorting to fresh sources of supply, to satisfy the demands upon it, and, even if its pumping power were largely augmented and fresh wells were sunk, it is by no means certain that a sufficient amount of water could be abstracted from the chalk strata in the Valley of the Lea without, to some extent, depleting that river. Indeed, it may be doubted whether the Lea can in any case be relied upon to furnish continuously the same amount of water as has recently been taken from it; and we cannot regard without anxiety the possibility of a failure of adequate supply in the populous districts which now obtain their water chiefly from that source."

The East London is not the only company whose supply is likely to run short in the near future. It is pointed out in the Report that the Lambeth Waterworks Company, without further powers, can scarcely expect to be able to cope with an annual addition of between 15,000 and 25,000 persons to their present consumers. To quote again from the Report:—

"General Scott gives his reasons for thinking it possible that in 1892 the maximum daily demand may exceed, by about 24,000,000 gallons, the maximum daily supply furnished in 1887. If this should actually happen, the amount would reach 24,000,000 gallons, or more than two-thirds of the utmost quantity which, according to the estimate of the Royal Commission of 1875, could be reasonably expected to be obtained for the use of the metropolis from the whole of the Thames basin between the source of the river and the sea. It would seem, therefore, that at no very distant period, the margin between supply and demand

may become perilously small; and that, at any rate in the case of some of the companies, the question how the existing sources can be supplemented from others outside the watershed of the Thames and Lea is one of which the consideration cannot be long deferred."

It will therefore be one of the first duties of the forthcoming London County Council, we apprehend, to take the subject of London's water-supply into its consideration. It is gratifying to find that the adoption of the "constant supply" system has made considerable progress, and that about 51 per cent. of the whole number of houses in the metropolis are now supplied on that system. An interesting explanation is given of the cause of the presence of eels in the water-pipes of the East London Company, reported two years ago. It is asserted that eels are never known to spawn except in salt or brackish water; that the eels, in descending from the Lea to the estuary of the Thames for that purpose, frequently leave the water, and cross any dampland that offers itself. One of the reservoirs of the East London Company is partly encircled by the River Lea; and it is concluded, as the result of a careful inquiry and examination by General Scott and Mr. W. H. Power (one of the members of the Medical Staff of the Board) that the eels going down the River Lea had left it at that point, possibly to avoid the foulness of its lower waters; the same route, it is argued, would be taken by the eels and elvers on their return from the sea to the river, and that, in crossing the gently-sloping turf which covered the reservoir, some of them had dropped down into the water through the apertures left for ventilation, and had subsequently made their way to the taps of the consumers. The company having closed the openings of the ventilators in question it is stated that all complaints of eels in the mains have ceased.

As to the third section of the Report, "Local Taxation and Valuation," we have no space to go into an analysis of the statistics therein given, and we can only say, in conclusion, that the study of this Report, with its valuable appendices, will be found to be the indispensable duty of every member of the new County Councils.

#### THE ARTS AND CRAFTS EXHIBITION SOCIETY. BOOKBINDING.

It is seldom that the trust of the lectured is so well rewarded as it was on the evening of the 22nd ult., when a delighted and crowded audience listened to Mr. Cobden-Sanderson's eloquent address on the craft of the bookbinder.

The syllabus issued by the above society states the object of the current course of lectures to be a desire to familiarise the public with the actual processes involved in the pursuit of certain arts and crafts. But the names of some of the moving spirits in the affair suggest a deeper purpose, which Mr. Cobden-Sanderson's address frankly disclosed, dealing as it did, from the standpoint of philosophic socialism, with the economic conditions affecting the artist and the craftsman, the amelioration of whose position we all desire.

The task of giving expression to this desire could not have been entrusted to abler hands. The discourse, which lasted an hour and three-quarters, was perfect in form and delivery, and, if we except the conventional girde at the man in the black coat, and that still more abandoned character, the capitalist, in excellent taste. Its literary standard was uniformly high, abounding in felicitous phrases, which were enforced with an earnest and persuasive eloquence.

The lecturer has taken up the craft of the bookbinder from the highest motives, and has acquired a complete mastery over all its details. The galleries contain specimens of his work which attest his skill and his refined artistic taste, and his name is well-known to all lovers of sumptuously-bound books.

After an exordium, in which the lecturer sketched the history of the craft from the days of papyrus rolls to the present, and dwelt upon the aims which should actuate the binder, he treated the audience to an effective little dramatic scene. Craving permission, he took off his coat, and donned with calculated emphasis what he hoped would prove the "banner of the future," a workman's apron, in doing so he fairly "brought down the house," placing himself *en rapport* with the sympathies of his audience.

Thus accoutred, he plunged into the business of the evening, and demonstrated with the utmost neatness and precision, by the aid of books in various stages of binding, and by copious illustrations on the blackboard, the whole art and mystery of bookbinding as practised by himself, folding the sheets, sewing them, putting on the boards, and covering them with leather.

Anxious to press on to the "really interesting points," he said little or nothing as to the tooling and decoration of the covers, or the designs most suitable for their embellishment,—drawing a bill upon Mr. Walter Crane, whose lecture is to complete the series, and will deal fully with this side of the subject.

The "really interesting points" turned out to be the artistic and social losses which result from the present subdivision of labour in this and other crafts. The lecturer enumerated the various "hands" through which a modern book passes after leaving the printers,—from the woman who sews the sheets to the "gentleman who sits apart and taps his forehead for appropriate designs" wherewith to decorate its covers. Labour so subdivided loses all its joyfulness, and the endless repetition of one operation becomes drudgery. Variety of occupation brings relief to the craftsman, and throws a charm over all his work. Moreover, it is but bare justice to reward the man who has pasted the boards by the enjoyment of decorating them. This higher duty would give him strength and rest, and he would return to the more mechanical operations with renewed interest and vigour.

But the lecturer would go even further than this,—much further. "There is," he said, "something incongruous, not to say gross, in the notion of offering a book to be bound and made beautiful for its own beauty's sake to a man who knows nothing about that beauty—nothing about its author; to a man who will give the book back bound as ignorant of both as when he received it; and yet he will have decorated it! I say, then, the binder must be an educated man, sensitive to the high beauty of what is beautiful in literature, conversant with it, and apt, as craftsman, to give imaginative expression to his enthusiasm."

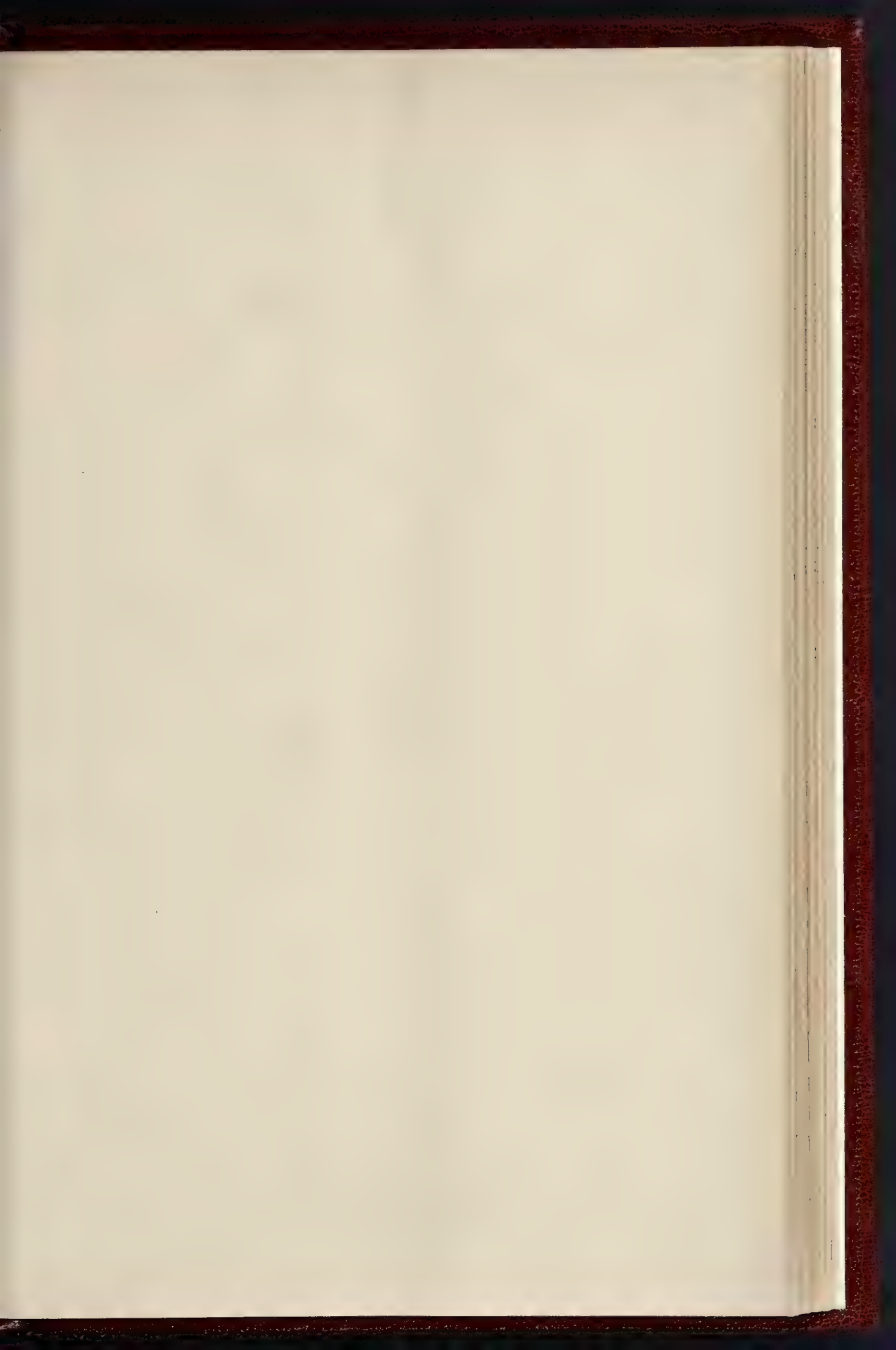
It would seem to follow that the binder should not only make his own paste, as Mr. Cobden-Sanderson does, and design his own covers, as Mr. Cobden-Sanderson does, but also possess his learning and general culture. He should, in fact, be a Matthew Arnold in an apron appraising with unerring critical insight the literary treasures to which his craft gives suitable and permanent protection. But why stop there? Why not write the book, as well as print it, illustrate it, bind it, and all? Where can the line be drawn?

Machinery in any form as applied to the craft, Mr. Cobden-Sanderson would, if we understand him aright, abolish. Like Mr. Ruskin, he is wroth with anything and everything which interferes with the evidence of human handiwork, of human success, and even of human error. In Paris he saw a binder engaged in reproducing old designs with the irregular spacing rectified by square and compass, to the lecturer's inexpressible grief. A book, he said, is the production of a human being, for a human being, and should have the marks of humanity about it. Every book should have its own individuality, and be treated *per se*. Mr. Cobden-Sanderson spends much time and pains in selecting from amongst the stocks of various manufacturers a skin suitable for his purpose, and having found it, he, for ever so small a book, cuts out the very choicest part. In order that it may be folded evenly over the edges of the boards, he spends six hours in paring the margins. Six hours of happy labour,—his well-filled mind reveling while in the images of beauty with which it is stored.

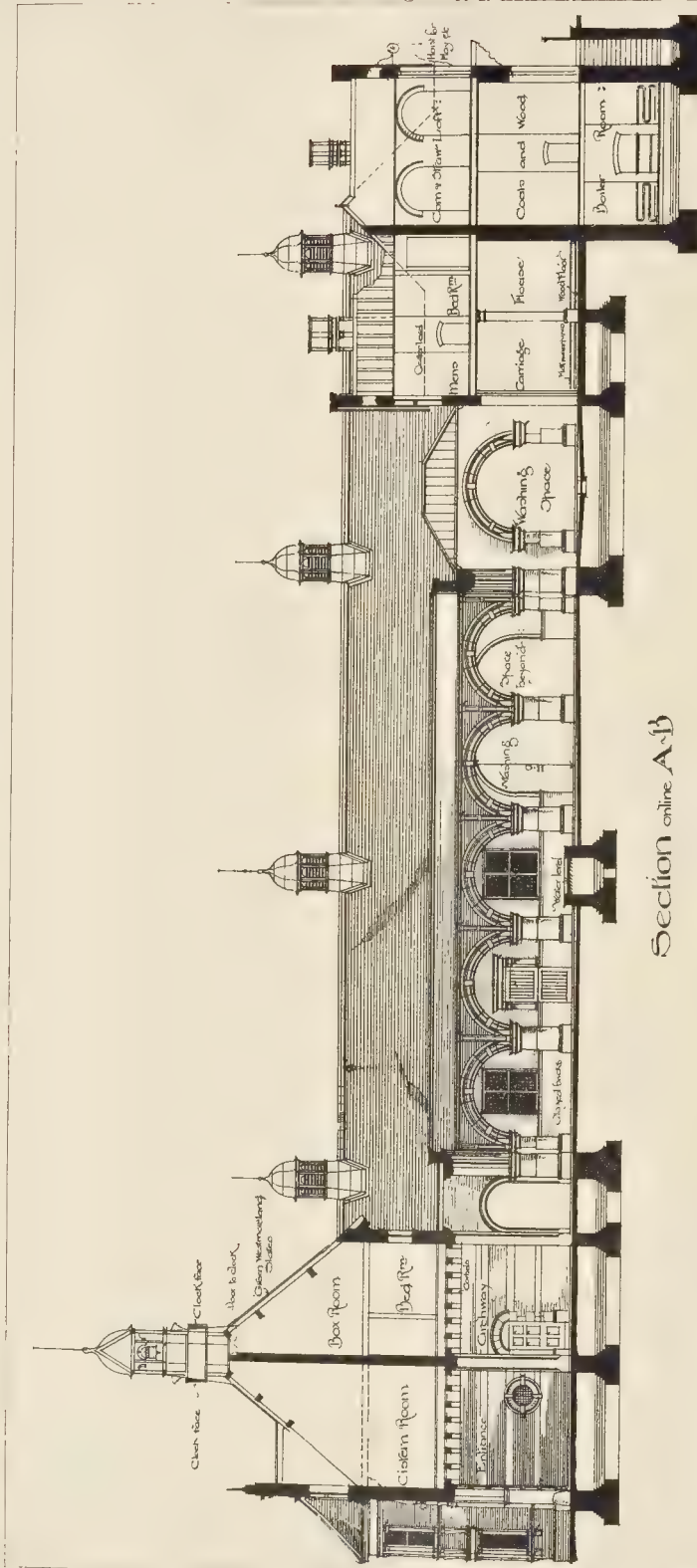
This is indeed Royal work, fit for the Court of a Francis I., a Henry II. and his book-loving paramour. Of course, it opens up the whole question of the distribution of labour,—whether, in fact, it is not on the whole better that the sewing woman should sew and the gentleman who "taps his forehead" go on tapping rather than make his hands sticky with paste or shaky with hammering.

In the press and hurry of this crowded world these questions have answered themselves, and the other numerous economic questions upon which Mr. Cobden-Sanderson dwelt will work out their own solution in due time; we cannot see in the near future the solution for which he longs, when there shall be no poverty in the world, but all shall be equally free, cultured,





THE BUILDING, DECEMBER 1, 1888.



Section online A-B

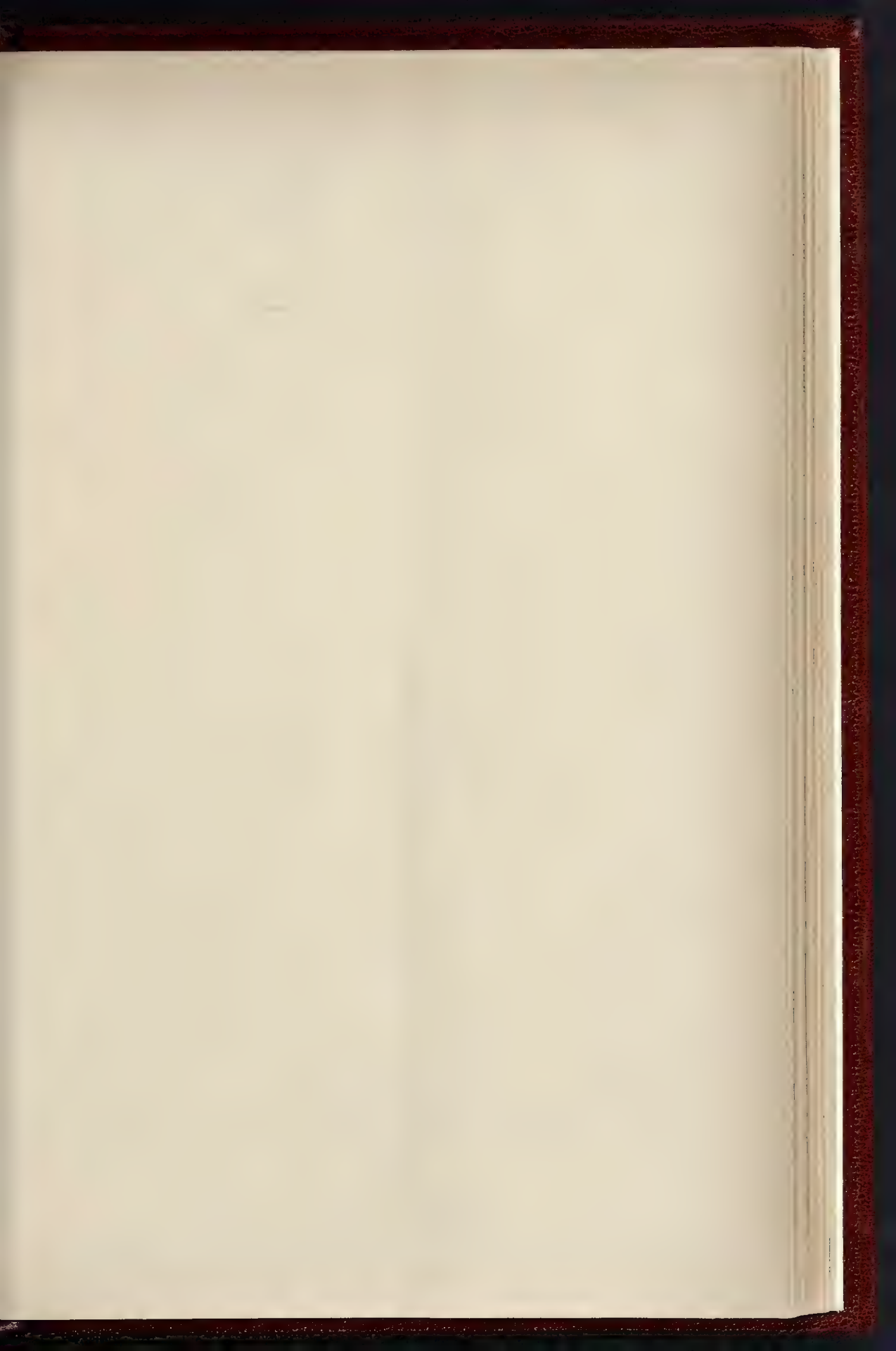














ASCOTT HOUSE, LEIGHTON BUZZARD



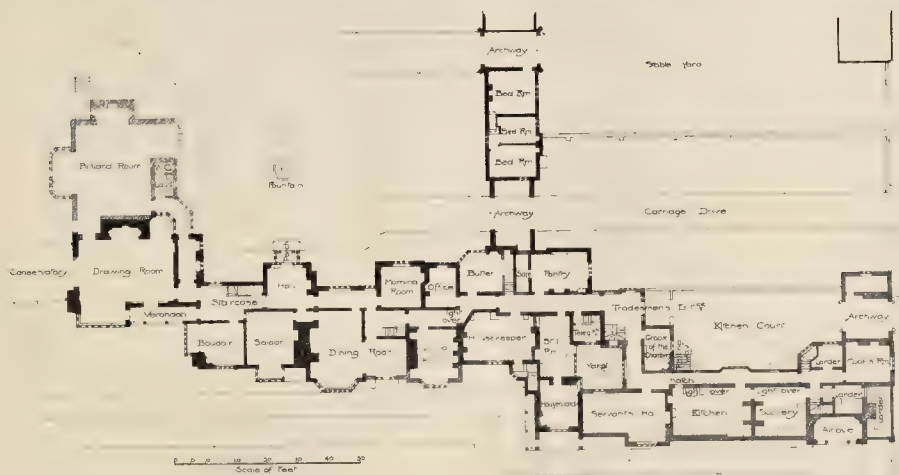
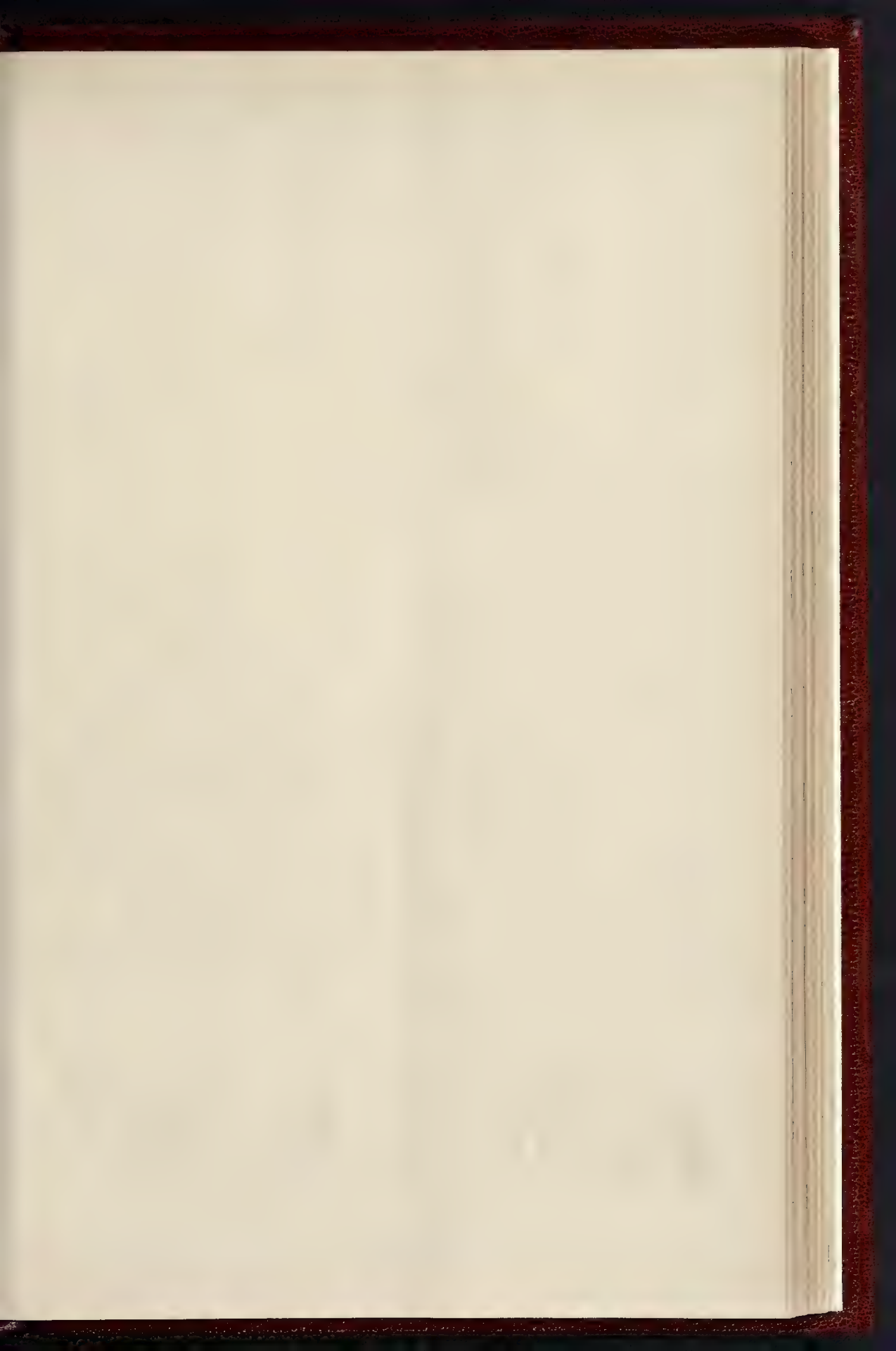


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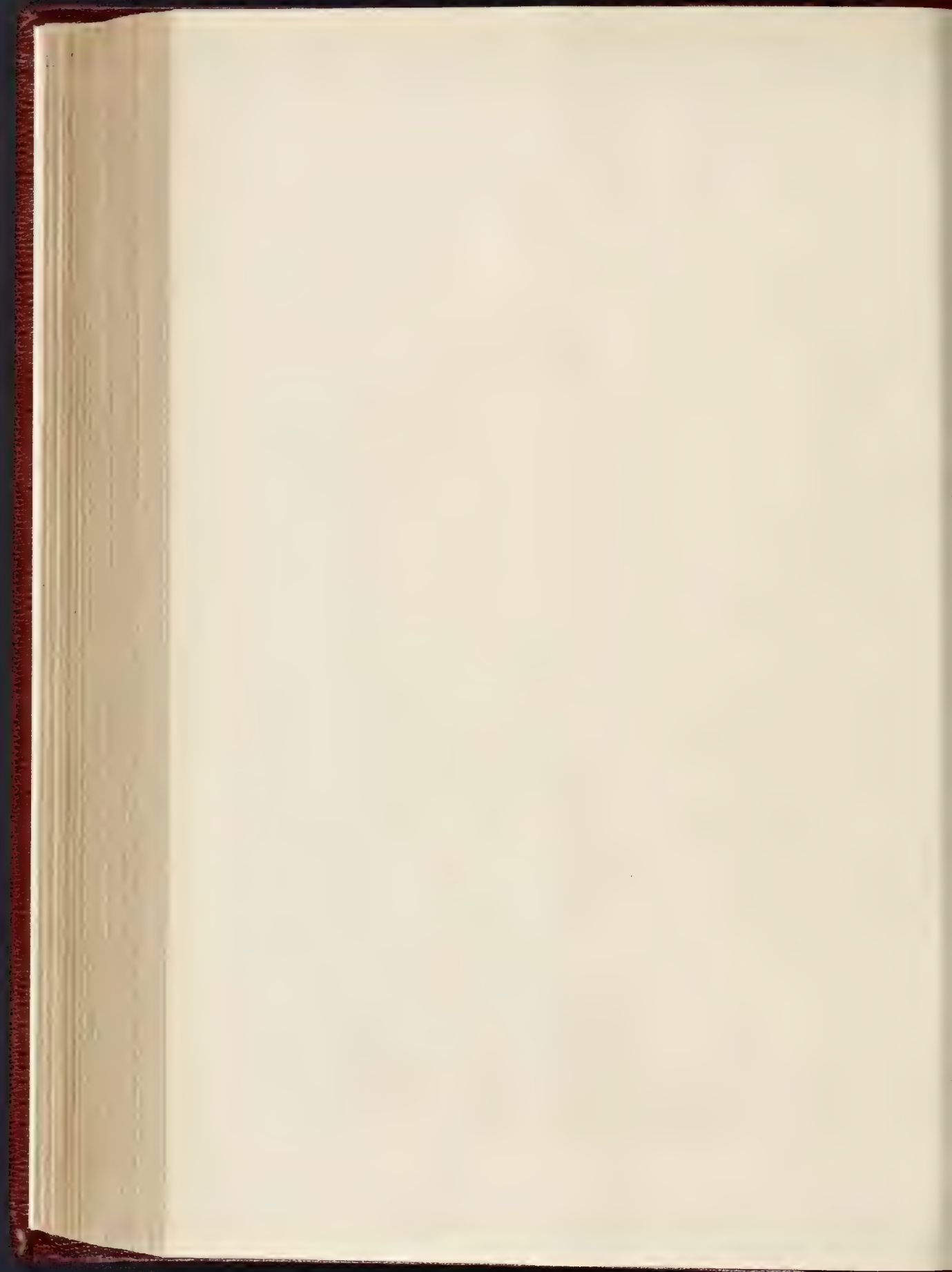


SCHOOL BOARD FOR LONDON  
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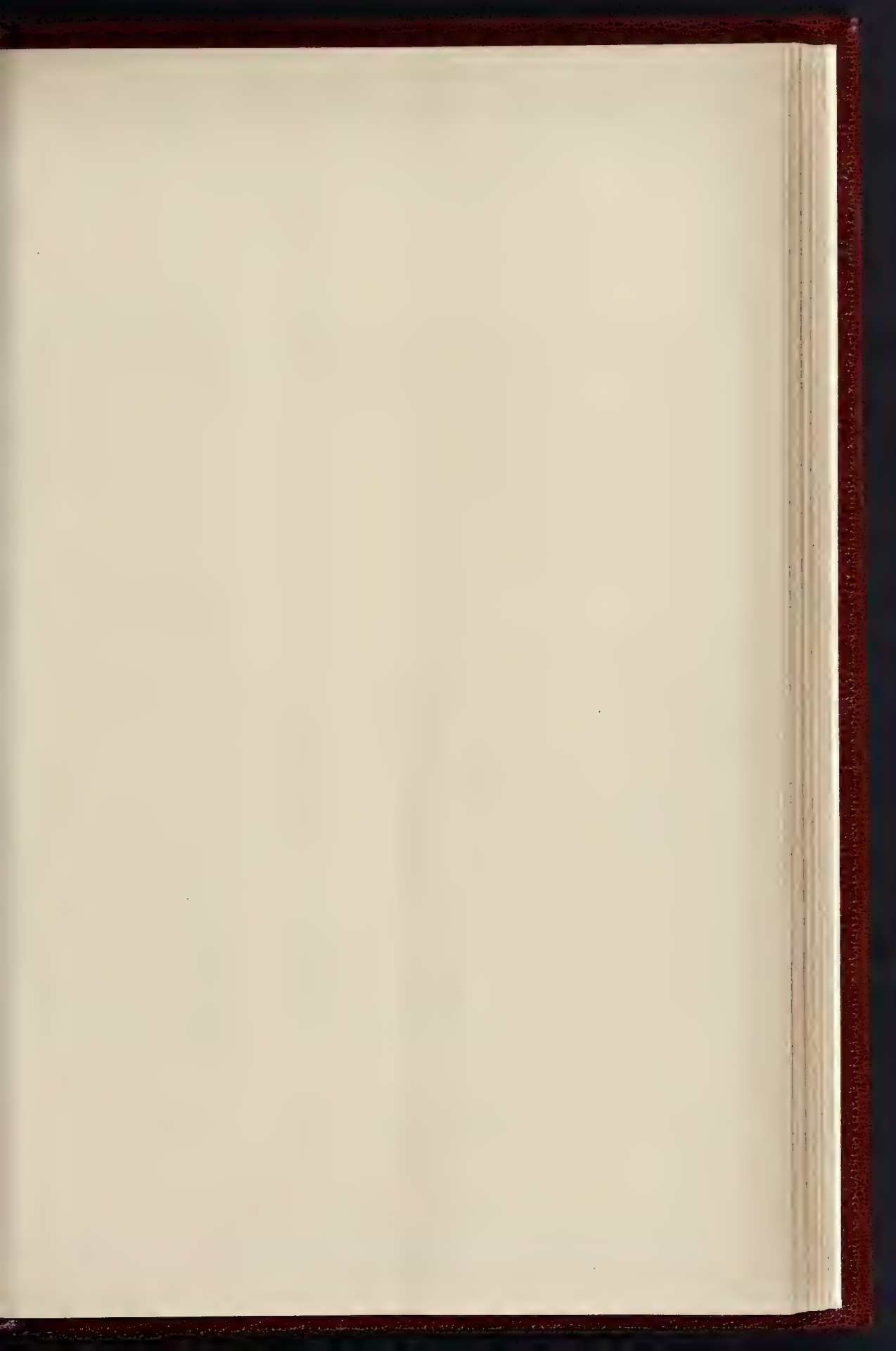














PANEL: FORTITUDE AND FAITH



PRINC

NATIONAL MEMORIAL TO GENERAL GORDON





FIGURE.



PANEL. CHARITY AND JUSTICE.

The Phototype Co., 35, Strand, London.

MR. HAMO THORNYCROFT, R.A., SCULPTOR.





virtuous, and happy. It is a dream which will fear never be realised. Meanwhile, he and those who work with him to this end deserve our thanks, and we thank him also for his personal efforts towards the resuscitation and advancement of a beautiful art.

#### THE AFFILIATION OF STUDENT ARCHITECTURAL SOCIETIES.\*

THE sole aim and object of the Architectural Association in the affiliation of all architectural student societies with its own body is to form a strong bond of union between them, so that they may be able to give a weighty expression of opinion on all matters connected with architectural education, both as to the best methods to be pursued in acquiring knowledge, and the most satisfactory means of testing the quality of the knowledge thus acquired.

As the Institute Examination is yearly increasing in importance, and will be shortly recognised by Royal Charter, we hope that eventually it will be obligatory on all practising architects. Its value to students cannot be exaggerated, and it is therefore of vital importance to them that they should have an opportunity of collectively expressing an opinion on any changes that may be proposed in the methods of conducting the Examination. There are two evils that can befall it, and both of which it is to the interest of the student societies to guard it against by insisting, firstly, that the standard of efficiency shall not be lowered; and, secondly, that the Examination shall encourage the study of architecture as a living art, and the acquisition of sound practical knowledge, avoiding the evils of superficial information hastily crammed for the purpose of passing the Examination, and forgotten as quickly as it was acquired.

As by the new Charter the Architectural Association will have a representative on the Council of the Royal Institute of British Architects, who will be the recognised representative of the student societies, it is of very great importance that he should be in close touch with as large a body of students as possible, and have every facility of ascertaining the views of his constituency, especially in connexion with the obligatory Examination.

It is in contemplation to make considerable modifications in the method of conducting this Examination, probably by dividing it up into three examinations, which will be held at provincial centres as well as in London; the position of these centres is a matter of importance on which the expression of the student societies should be obtained. The greater frequency of the examinations and the preparation of the necessary drawings to be submitted as testimonies of study would give an object and a direction to the work of the Classes of the student societies which they have not at present.

These societies should afford facilities for preparation for these examinations, and as they are in the position to induce their members to come up for examination, I hope that a healthy rivalry may be established among them as to which shall produce the greatest number of passes.

The advantage of contact with men interested in the same pursuits as one's self is, in my mind, the greatest advantage to be derived from our student associations, and the more opportunities that can be afforded for these meetings the better.

Most of the objections that have been raised to our scheme arise from the want of *esprit de corps* among the provincial members of our profession; this, I think, is caused by a lack of opportunities for mutual intercourse, and by the isolated way in which provincial practices are carried on. If, through our affiliation scheme, we could be the means of bringing the architects of the future together to discuss matters affecting their profession, they would soon begin to take a larger view of it, and, by mutual criticism and advice, do wonders in advancing the art.

The formation of student associations in all large towns in the United Kingdom is, in my mind, only a matter of time; but it is a difficult matter to know how to afford those students who are placed in the smaller towns, where the number of students is not sufficiently large to allow a society being successfully

carried on, the facilities for study that they must have in order to compete successfully with their more fortunate brethren in the larger towns. I think it would be a good subject for discussion whether these men could derive more benefit from belonging as country members to the metropolitan or the provincial associations. I, personally, am in favour of their joining the provincial societies, and thus forming local centres through which they are more likely to be kept in touch with the working of the Classes than through the parent Association. In a complete scheme of affiliation I should like to see all the United Kingdom mapped out into districts, with a recognised association of students for each district, to which it should be as absolutely necessary to belong as for the student to have passed through some school for his ordinary education. With the increased competition in our profession I am quite sure that it is only by systematising our methods of study that the architects of the future will be able to hold their own.

The new form of articles of pupillage recently issued by the Institute\* provides for the pupils attending lectures and classes of instruction. I am well aware that there exists in the smaller towns a dislike for the pupils and assistants of architects meeting, the idea being that the competition for the limited amount of work would be increased by the students comparing notes as to the work being done in their respective offices. I think that this mistrust is not well-founded, speaking from a fairly long experience in the Architectural Association. The men there do not talk about their office work; they are all too busy with their own ideas and studies, and there is at the same time a loyal desire on their part to support the dignity of the office they belong to.

Leaving the broad principles of the value of this union, let us now for a few minutes consider the value to the individual societies of connexion with a central body. In discussing this question with the Birmingham Architectural Association, I am quite sure of obtaining a favourable response. The connexion between the two societies has, I am convinced, been of mutual benefit, and I hope that, as the senior affiliated society, the Birmingham branch of the Architectural Association may develop and increase the scope of usefulness which it has already so well sustained. But though the connexion between the two societies has been successful, it by no means follows that there is no room for improvement; and I hope, after your discussion, to take back with me several valuable suggestions for the further development of our scheme; and now, if you will allow me, I will discuss a few points of detail.

The members of affiliated societies would have the following advantages, viz. the use of the loan library, the number of books being regulated by the number of members in the society, and the subscription paid; the power to join all of the Classes, and to attend the ordinary meetings, visits, and excursions. On a member migrating to the metropolis, his connexion with the provincial society would enable him, by showing his receipt for the subscription to the society for the current session, to enjoy all the privileges of ordinary members of the parent society, except that of voting.

At the end of the session, these privileges would lapse, and he would then, if he desired to continue to enjoy the advantages of the Association, have to be elected as an ordinary member. In that event it would be well if the provincial society made some arrangement for retaining him as a member on some nominal subscription. This scheme for the migration of members should also hold good for the provincial society, so that in the event of a member of the metropolitan Association coming to the provincial society, he might join on the same conditions as stated above for the parent society.

The question of migration has been an open one for some time, and it is hoped that the solution here given will be approved as a fair adjustment of the difficulty.

With regard to the inter-working of the Classes as they have done up to the present time, it will be obvious that, if the affiliation includes all the student societies, some modification of the present arrangement will have to be made, and I think that the best method to adopt will be for the whole of the Class-work to be sent up to London, and then equal parcels made of it to divide amongst the provincial

societies. Of course, in that case, the work of each society should be criticised before being sent to London, and the work sent down from London, which should not contain the work the particular society had sent in, would give an opportunity for the students to see how the other provincial societies did their work. I hope I make this plain. What I mean is that the affiliation scheme will not only bring the provincial societies into touch with the metropolitan society, but also with one another. The good work that is done by our provincial brethren will thus have a wider influence.

The necessity for preparing special drawings for the Institute Examinations will no doubt modify the working of some of the Classes; but as the revised system of conducting these examinations is not yet before the public, I am not at liberty to enlarge more on this subject.

The next question to consider is whether it would be possible to arrange for the repetition of some of the courses of lectures that are delivered at the Association, and which are amongst the most popular of all its branches of work. I have but little doubt that, should the provincial societies show any desire for this, arrangements could be made for some of these lectures to be delivered on payment of little more than the travelling expenses, so that it resolves itself into a question of fees, and I think that the time has come when the students of architecture must be prepared to pay a little more for their education than they have done in the past.

The publications of the Association, "The Sketch-book," and "A.A. Notes," are open to all the provincial societies, and we should welcome subscribers and contributions from them. In connexion with the "A.A. Notes" the provincial societies could do great service by making it the recognised official organ of architectural students. They could also greatly assist us by helping forward the Sketching Club Scheme, which has for its object the organisation of a complete system of advisers to students on sketching tours,—the idea being suggested by the success of the Cyclist Touring Club,—and the collection and formation of a complete list of the buildings of architectural interest in the United Kingdom. We have started our index of such buildings, and if we could have the increased support which all the student societies could give us, we should issue the parts in greater numbers. At present we are only able to give one sheet a month. In calling your attention to this scheme, I feel that it is intimately connected with the subject under consideration, because the cordial intercommunication of such information as we seek to obtain will be one of the best means of cultivating that *esprit de corps* which is one of the principal objects of our scheme.

In addition to this index of buildings, we also seek to form a collection of measured drawings of all the examples of old work that are of value for study, and as a record of what is so quickly passing away, owing to natural decay and reckless destruction, either by entire removal, or what is often almost worse, complete restoration.

If the provincial societies would each make themselves responsible for the old work in their immediate neighbourhood, and, by a systematic effort, secure measured drawings of all that is worth preserving, it would help in advancing our project, and also be of great benefit to the provincial society, as it would be the means of forming a most interesting collection, and also of preserving and bringing out those slight characteristics or local features which are of so much advantage in making the design in harmony with its surroundings. The extension of the use of our loan library will doubtless be a great benefit to students who have not the command of books, either of their own or belonging to the office in which they work, and it would be necessary to increase the number of the lent books in our library from time to time. As the influence of the Examination extends, I am afraid our library, excellent as it is, will, however, hardly be able to keep pace with the demands, and I should strongly urge all the provincial societies, where they have free libraries in their towns, to bring whatever influence they can to bear on the authorities to have the principal books recommended by the Institute for study placed on their shelves.

As a training to a proper study of books, I would recommend the formation of Correspondence Classes, which have been successfully worked in the following way:—

A list of books recommended for study by those preparing for the Examination

\* A paper by Mr. Herbert D. Appleton, F.R.I.B.A., President of the (London) Architectural Association, read before the Birmingham Architectural Association on the 20th, ult., as briefly mentioned in our last.

\* Printed in the Builder for Nov. 17, p. 369, ante.



is circulated amongst those who have agreed to form the Class, and certain books are allotted to each student, who prepares a careful digest of the book, illustrating it with marginal sketches of buildings, either from actual works or illustrations, the peculiar features of the illustrations being explained in notes attached to them. A fortnight or three weeks is allowed each student for the preparation of the digest, and it is then sent round to the other members of the Class, who have themselves prepared digests of other books, any additional information in the way of note or sketch being added by each student in turn; and thus, by a systematic arrangement of carefully-prepared notes, a mass of useful information is gradually accumulated, and, being properly indexed, is always available for reference or study. The value of working in association in this manner is manifest. Each student in turn gets the benefit of the others' reading, or receives hints and information as to the contents of books of which he otherwise would have no idea; but the principal object is the training in a methodical habit of reading and note-taking, which will be found, when once acquired, to be of great service in impressing facts on the memory. These notes should all be sent to the secretary of the Class to be put in circulation. I have dwelt somewhat at length on these Correspondence Classes, as I believe they have not hitherto been a feature in the work of your society, and I believe they would form a very valuable one if properly carried on. The Correspondence Classes are especially suited for those country members who are unable to attend the Classes, and the difficulty of reaching whom I have referred to in the earlier part of this paper.

The study of modern architecture, which I ventured to advocate in my address to the Architectural Association,\* is the last feature I would refer to. Whether the scheme that I put forward will come to anything or not I am at present unable to say, but, nevertheless, I hope that some method for the study of the excellent work that is being done all around us may be found. We cannot help studying and being influenced by this work, say what we will. It must appeal to us in a way the old examples that we know so well cannot do, and in order to do this we must train our critical powers to be able to appreciate what is good and to avoid what is bad. The excellent work of the past is the alphabet that we all must study and learn if we would spell out anything worthy of the age we live in, but old work itself cannot be adapted to modern requirements by simply reproducing it line for line. It was executed for purposes for which we have little sympathy, and by men whose motives we cannot hope to appreciate. If we are to take part in the advancement of our art we must place ourselves abreast of the times, and the only way to do this is to give up the isolation we have observed in the past, and by united effort join hands to work towards one common end. If we succeed in forming an annual exhibition of architectural works in London, I see no reason why this collection should not be sent down for exhibition in the provinces after the London exhibition is closed.

It is in no selfish spirit that I advocate the closing-up of our ranks. It is with no intention of keeping out any who have the ability to do the work, neither is it with a view to protect the sacred principle of 5 per cent., for I believe that good, honest work will always be able to command good, honest pay. But it is in the hope that with a united front we may convince the public that our art is worthy of a high place in their regard. It is with a strong belief that by better acquaintance with our brethren we may cultivate a professional spirit that will, by its influence on individuals, raise the tone of those practising as architects; and as the honour of the profession is, after all, in the hands of its individual practitioners, the public will come to recognise that the benefits that accrue from this union are for the public weal.

A discussion afterwards took place, and a vote of thanks was passed to Mr. Appleton.

"F.S.A."—In reference to a letter from the Secretary of the Society of Antiquaries in our last, we received a letter from Mr. Binyon, too late for last week's paper, explaining that he had been under the impression that he had a right to use that affix as a member of the Society of Arts.

\* See *Builder*, p. 301, ante.



The National Monument to General Gordon, Trafalgar-square.  
Mr. Hamo Thornycroft, R.A., Sculptor.

## Illustrations.

### NATIONAL MONUMENT TO GENERAL GORDON.

WE give illustrations of the central figure, and the two bas-relief panels of this monument, recently erected in Trafalgar-square, and of which Mr. Hamo Thornycroft is the sculptor. We have already commented on the fine quality of the work, and it is satisfactory that a monument to such a man as Gordon, however inadequate in scale and importance, should at least be characterised by high artistic feeling, and simplicity and severity of style.

The feeling in favour of realistic treatment of portrait figures in the present day, which in the main is no doubt right, throws nevertheless increased difficulties in the way of the sculptor, from an artistic point of view. The dress of the principal figure in this case is eminently unsculpturesque, but this will be pardoned if we are assured that it is a truthful representation of our lost hero in his habit as he lived. Mr. Thornycroft's idea seems to have been to give the realistic element in the portrait figure, and to raise the monument to the region of the ideal by the symbolical bas-reliefs. A similar idea seems to have governed the design of Mr. Gilbert's charming monument to Fawcett in Westminster Abbey, which we illustrated some time ago; and this is perhaps the best course which a sculptor can take when called upon to design a monument to a man of modern days.

We append also a small view of the monument as a whole.

### BOARD SCHOOL, GOODRICH-ROAD.

The Board School in Goodrich-road, East Dulwich, was erected in 1886 for 1,600 scholars.

at an inclusive cost of 17,410*l*. The illustration (reproduced from the drawing which was hung in the Royal Academy) shows the boys' and girls' schools in two stories, with the infants' school as a separate block. The plan is very much on the lines of the Lavender-hill School, having nine class-rooms and a hall on each floor, with drawing class-room over the halls lighted from the north. This school, also, has a cookery centre attached. The architect is Mr. T. J. Bailey, Architect to the Board.

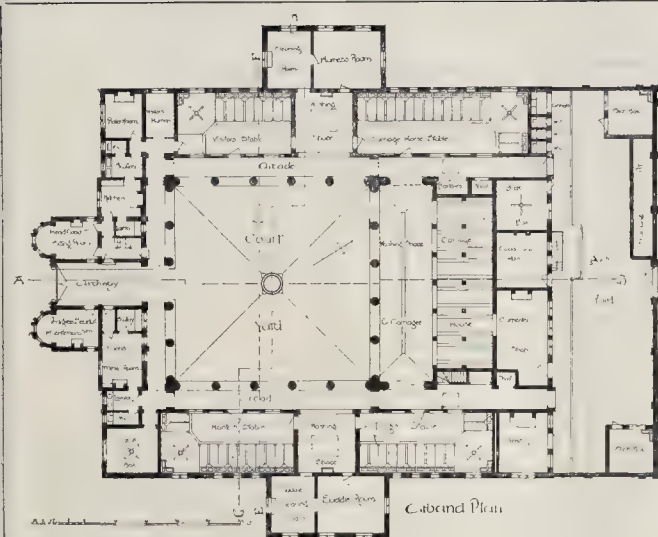
### ASCOTT HOUSE, LEIGHTON BUZZARD.

This was originally a small half-timbered house of the early part of the seventeenth century. The illustrations show the recent additions made by Messrs. Williams, West, & Slade, architects. Messrs. Cubitt & Co. were the builders, and Mr. Thomas Lee the clerk of works.

### DESIGN FOR STABLING FOR A COUNTRY MANSION.

The design illustrated was awarded the Architectural Association Medal this year. One of the points to be observed was that the buildings were to be placed round a quadrangle. The method adopted has been to keep the service part of the stable in a separate yard at the back, which has also a separate entrance. The men's bedrooms are on the first floor over the carriage-house. The hay and corn lofts are over the carpenter's shop, coals and wood, &c., and there is a hoist as shown, and two "shoots" (shown on plan) for serving the two lines of stables. The washing spaces are arranged centrally on each side. The plan given is a tracing made from the more complete original for photo-lithographic purposes. The materials





Design for Stabling for a Country Mansion.—By Mr. B. F. Fletcher.—Plan.

proposed to be used in the construction were red Ruabon bricks and stone, and green Westmoreland slates. There was a  $\frac{1}{8}$  in. detail of part of the entrance front, a first-floor plan, and a perspective sketch, which are not published.

B. F. F.

#### "QUANTITIES:"

##### INSTITUTE OF BUILDERS.

At a meeting of the Institute of Builders, held at its offices, Bedford-street, Strand, on the 22nd ult., Mr. Thos. F. Rider in the chair,

Mr. H. T. Ashby (of the firm of Ashby Bros.) read a paper on the "Quantities" question, in the course of which he said:—

It is not my purpose to enter into the history of quantities, nor to trace how they have become the important factor in the constructive trades that they are and have been for many years, although this branch of the subject would be a most interesting one,—a subject which I hope to hear treated by one of our surveyor friends.

My chief object is to initiate a discussion upon points which often occupy the thoughts of both builders and surveyors,—matters which involve much that concerns the future pleasant relations of those who employ both.

I approach the subject in an entirely friendly way; for while standing here as a member of the Institute of Builders, interested in all that affects the great trade it represents, I can look back with great pleasure upon the many years I spent as a member of that honourable body, the quantity surveyors of London, among whom I made and retain many friends.

Quantities of some kind must have existed with the beginning of contracting, but our complex civilisation, with its subdivision of all kinds of labour, has largely relieved the contractor of the burden of measuring and calculating the well-nigh endless items that go to make up an important building. This is now done in many cases far better than it would be or could be in most builders' offices.

In the great advance which has taken place in the constructive arts, architecture undoubtedly has shared largely. Design has greatly improved. Execution has also greatly advanced, both as to appliances and skill, as evidenced by the celerity and certainty with which substantial work is now done. But a doubt exists whether quantities have kept pace with the calls made upon them.

In the times of our fathers and grandfathers, most buildings partook of the brick box type. In those days everything was of a stereotyped kind. One building was so much a counterpart of another, that it was more a matter of quantity than of description. The doors and windows, the stonework and walls, the porches and pediments, the mouldings and

finishings, all had such a family likeness that little skill was required in either preparing or reading a bill of quantities. In those simple days, when "Classical" architecture, with its fixed types and ever-recurring details, held its own, very little originality was tolerated, and all was plain sailing. But now, many an architect thinks he has done less than his duty if any part of a building designed by him contains any great resemblance to the works even he has designed before, much less a likeness to another's work. I freely admit that this makes the work of a quantity surveyor more difficult, but this applies also to the architect and the builder, and that which is grappled with by one should be by the other. Is this so?

I am not here to treat this matter weakly, or to extenuate that which I believe to be wrong, and I therefore say boldly that too large a proportion of the bills of quantities that have passed through my hands for many years have been unworthy specimens, faulty in design, slovenly in execution, and bearing throughout an evident intention to shirk responsibility. This last defect is the cardinal sin, for its influence is seen throughout the entire work, giving obscurity of description instead of the utmost clearness, and sweeping items couched in the most general language, in place of carefully separated measurements; and such bills of quantities always conclude with the heaviest percentage as surveyors' fees, coupled with the charges for writing or lithography in inverse proportion to the quality of the execution.

Now all this is indicative of the incompetent man. But are these indications of incompetency far too frequent?

Now, with regard to the utterly bad productions of the so-called quantity surveyor, the only treatment that can be safely recommended is to let severely them alone, return them to those who send them, or, better still, end their mischievous existence by putting them in the fire, and then join in the agitation for altering the law of libel, which now prohibits a wide advertisement of the demerits of the authors of such trash.

Now, this evening's discussion would, I think, be unprofitable if it be not practical; and, to promote discussion and criticism, I will descend from the general to the particular. I propose to deal with three points:—

1. That the surveyor should be a thoroughly trained and competent man.
2. That the quantities should contain the clearest possible description and measurement of everything to finish the proposed building, and an exhaustive forecast of every process in the execution of the work.
3. That the responsibility of the surveyor for the correctness of the quantities be asserted beyond question or dispute.

Let us examine the case as affected by the first article of faith.

Are the majority of surveyors either trained or competent?

I say, unhesitatingly, no; the work before referred to proves this. It is not every man who could possibly be made into a good quantity surveyor, and very few who could become of the first rank.

He must naturally be a man of considerable grasp of mind, great quickness of perception, possess a tenacious memory, great order of thought and power of organisation and concentration, and be a man of decision. These natural gifts must be dominated by rigid integrity. It is necessary that he be able to deal with the work immediately under his notice, to the exclusion of all other matters, and yet be able to take up any point of his various jobs as though he had never laid it down,—that he should be able to answer almost any question, and certainly to be able to readily lay his finger upon any detail required throughout all the quantities of works in progress.

This may seem exacting, but I am glad to know, not nearly so much so as it sounds.

The quantity surveyor should be able thoroughly to hold his own position without fear or favour, and to consider himself to be the custodian of the interests of the builder quite as much as of those of the owner. These qualifications are not of my own imagining, but those possessed by surveyors I know.

Now, having got a promising young man, what is the best curriculum to ensure his thorough training?

I have not sufficient presumption to prescribe this in anything like detail; but I may be allowed to hint that it should be decidedly more practical than academic; it should savour more of deal shavings than pencil chippings; the boots of the student should be more soiled with mortar than his fingers with ink; he should know more about a two-foot rule, at first, than an ivory scale; he should know more about bench, banker, trowel, and forge, for the early part of his training, than he should about dimensions and abstract-paper, scale and dividers. I would rather he should drive a plane than a pen, and that he should know the bond of brickwork rather than the mysteries of ruled paper; that he should learn the actual practical work of a building before he presumes to instruct a builder what he has to do by means of a bill of quantities.

This is, in my opinion, the reason why some of our best quantity surveyors occupy the position they do; although they were not in their youth formally dedicated to the profession they adorn, they have grown into their practice by sheer force of character and attainments, by practical training in the builders' workshops, and through a builders' office. And yet I have sometimes heard these gentlemen called untrained surveyors because, forsooth, they have not graduated through an architect's or surveyor's office!

By the foregoing remarks, I do not wish in any way to disparage the best office training. This I consider quite as important as that on the works. But office training will never fit a man for the stress and strain of "extras and omissions" and disputed work on the building; and we all know how vital this branch is. A surveyor, to hold his own in this, must know, when measuring or valuing hidden work, how this work should have been done, guided, perhaps, by very obscure evidence from a stupid or forgetful foreman, and trammelled oft-times by unfair representations from both sides, and, thus hampered, decide accurately points that none but a practical man, who has seen kindred work done, could decide.

This is a serious aspect of the question. Loss, often ruin, has befallen the man who has been misled or induced to persevere in litigation by the advice of an impractical surveyor.

When a set of drawings has passed through the hands of a competent surveyor, the sense of security and confidence felt in them by both architect and builder is greatly strengthened. For in the careful preparation of quantities from them, weak places are almost sure to be detected.

How amazing, therefore, is it, from this point of view alone, that architects should so often entrust the quantities to incompetent men! More astonishing still is it that they have them taken out in their own offices.

This latter course cannot be too much condemned. Many architects have had their reputations seriously impaired by both the above courses, and when difficulties have arisen,—and they continually arise,—by the last proceeding, the architect is liable to imputations damaging in the highest degree.



The serious consequences to all concerned,—to architects, builders, and owners,—from the misdeeds and shortcomings of the sham or quack surveyor, are too notorious for comment here. But what efficient professional body is there to call them to account? For they flourish like rank weeds, with no one to root them out.

What test examination is there? What diploma or certificate of fitness? What watchful body with power to maintain a high standard of conduct and procedure, to investigate misdeeds, to purge the profession of black sheep?

While physicians, surgeons, even dentists, are eagerly raising their standards of efficiency and purity year by year,—when even plumbers are submitting themselves voluntarily for examination and are seeking certificates of proficiency,—should surveyors be less anxious?

I am confident our surveyors would be equally benefited, raised, and sustained in their career if they had the support and stamp of a strong and able central body to lean upon.

There must be strength, control, and organisation to ensure healthy vitality in any body.

In dealing with the second proposition, that the quantities should contain the clearest possible description and measurement of everything to finish the proposed work, and an exhaustive forecast of every process in its execution, I shall proceed by a very few illustrations of "how not to do it."

Among the "general items" at the commencement of a bill we rarely find a description of the site and its surroundings, the means of access, and, if in the country, the nearest railway-station, village, or town.

If in London, although "making good to all adjoining property" is rarely absent, no hint or description is given of what these surroundings are, nor the distance or depth of nearest gas and water pipes or sewers.

District surveyors' fees are inserted, but the area and number of stories are rarely given.

The answer to these and other objections may be that the estimator can get all these particulars from the site and from the drawings. Quite so.

He could take out the whole of the quantities by the same rule. But I hold very strongly that all these and every other information, in the fullest detail, should be given.

With reference to the measured items, there is great need of a uniform standard.

Excavation is sometimes given, "including all planing, shoring, and strutting;" sometimes, when the latter is measured separately, no indication is given of the width or depth of trenches, or whether the digging is in piers,—all points influencing greatly the value of the work.

Then, in measuring brickwork, the time-honoured method is to lump it altogether, utterly ignoring the number of piers, the frequency of openings, and the height of the various walls, except, perhaps, in factory chimney-shafts.

It always seems inconsistent to me to scrupulously measure such items as quirks and arrises to plastering, and yet altogether to ignore the greater value of reveals of openings, angles of piers, quoins, and all work that requires careful plumbing in brickwork,—items which absolutely control the value of the labour to a rod of brickwork. These items are absent unless they occur in cut or rubbed work, and then are sometimes missing, unless they are to irregular angles.

The only instance I am aware of of any attempt to grapple with this is the practice of a well-known surveyor, who, in his bricklayer's bill, has an item of so many rods of "openings," thus giving a rough idea of the open spaces, but this does not indicate the lengths of walls between the plumbing points, nor how many piers and projections there are.

The various heights to which stone has to be hoisted are always indicated in separate items in good bills of quantities, but in the same bills a like separation of heights in brickwork does not show itself, although the height to which the roof-trusses are to be fixed may be shown.

You will see I am here not advocating any reforms beyond those indicated by lines already existing within the bills.

Why should some surveyors give all the details of labour to stonework, and some surveyors stone, including beds and joints, and then the rest of the labour in detail, while others just put down a lump cube, including all labour of every kind? I have heard it said that the practice of surveyors in measuring the detail varies so much that it reduces the pricing to very much of a lottery. Now, this should not

be, and in this, as in many other cases, it is surely time that the surveyors, in conference or committee, instituted general rules of practice.

I have selected the foregoing instances, not as the most important, but as familiar points, to illustrate my contention that even in the best class of quantities great improvements may be made if only a more uniform standard of procedure be observed.

It is obvious that these could be indefinitely multiplied, but not without outraging the proportions of this paper.

There are those bills of quantities, before referred to, which are beneath criticism, such as one that lately was brought under my notice, in which the quantities of an embankment to a river were thus elaborately dissected. "149'-0" run forming embankment to river, as sketch." Here was inserted a rough sketch,—not to scale,—with figured dimensions and description of material, "to be executed as 'tide work,' and to include digging and barging away ground, and any planing and strutting necessary in its execution." That was all. A better illustration of the "lumping" style would, I think, be difficult to find.

I have left the most important factor in this question to the last, because it is the key to the whole matter.

The responsibility of the surveyor who prepares the bill of quantities to the contractor, who bases the amount of his contract upon these bills, has been considered to be the greatest guarantee for accuracy, and that the utmost care and skill the surveyor possesses will be used, and that any want of care and skill will be exercised at the surveyor's peril. Hence the ingenuity shown, especially by incompetent men, to evade this responsibility by "sweeping" descriptions "covering" items which may mean anything or nothing, or everything; a studious avoidance of clearness; a general "slipperiness," which is difficult of definition, but the character of which many of us know too well.

All this tends to show that this liability was considered a real and definite one,—not a moral responsibility, but a legal obligation.

Now, this has proved a pretty good working arrangement. Many a man who would have liked to finger the "so much per cent. upon the total amount of tender" has hesitated to "go in" for it, not from a sense of his unfitness for the work, but from the loss and punishment which the result of that unfitness might inflict upon his pocket.

Some of this class, more hungry than others, or greatly daring, have tried to shield themselves in the following brazen-faced way. The phraseology may differ, but the aim and intention are the same. A clause is inserted in the quantities that:—

"The successful contractor will be allowed one week from date of acceptance of his tender for the purpose of checking at his own expense the accuracy of the quantities. If, after such checking of the quantities, the contractor should not be satisfied with their accuracy, they should be revised by the contractor and the surveyor of the quantities jointly, and if, on examination of the whole of the items, the sum of any errors does not effect an increase in the amount of the tender, the expense of revising the quantities shall be borne by the contractor, and no further question as to the accuracy of the quantities will be entertained."

You will observe that nothing is here said as to payment to the contractor, or non-payment to the surveyor, if the quantities are found to be wrong. This, of course, is characteristic.

I have seen attempts to evade the consequences of error more glaring than this, in which no offer of an opportunity or time is made for the verification of the quantities, but where they were thrust down the throat of the contractor with the plain and bare intimation that no claim for any deficiencies would be entertained after signing the contract.

It may be said that such gentry are of no weight or influence, and that the consequences of their actions are unimportant upon the profession and trade. I hold, however, that sharp practice and improper conduct in any profession, if allowed to pass without protest from the governing body, is a slur and scandal upon that body.

But there is now a serious,—nay, an exceedingly grave,—feature to be noticed. The eminent surveyors of London, who have, so far as I know, never repudiated or questioned their responsibility to the builders, are no longer masters of the situation, for by a recent

legal decision\* it seems to have been settled that the supposed responsibility of the surveyor to the builder has no existence, and the very foundations of the mutual confidence which has hitherto ruled their business relations are destroyed. On the one side, the guarantee for the accuracy of the quantities will no longer ensure good work, for if no responsibility exists the great incentive for such work is gone, and the slipshod man is so far on a level with the capable one. On the other hand, if there be no contract between the surveyor and builder, as this decision implies, there surely cannot be any obligation to pay on the part of the builder; so it cuts both ways. The moral obligation, no doubt, exists, and this, we hope, in any case will actuate the majority of both communities. But, unfortunately, there is a class who are apt to interpret their moral responsibilities by their legal liabilities, and for these binding laws have to be made.

The situation seems intolerable, and some means must at once be taken to clear the matter up. It seems monstrous that a man should not be responsible for his imperfect work. What would be said of a tailor who expected full payment for a coat with a big hole in the back? That is no more absurd than for a surveyor to expect payment for quantities with a big deficiency in the brickwork. And it would be equally immoral, whatever the legality, for a builder to refuse payment for a correct bill of quantities he had used. And yet this seems to be what the law allows.

It has been said since this decision that the action of the law is one-sided, that the builder is a bailee,—whatever that means,—and bound to hand over the surveyor's fees, whatever the character of his work may be. If this monstrosity be legal, I cannot imagine the body of surveyors long consenting to exist under such an iniquitous law. Otherwise it is certain that contractors would be compelled to protect themselves from the irregularities which (already too frequent) would soon become rampant, and thus the discontent which now exists as to the appointment of surveyors, and other matters, would become intensified. However much such a result might be deplored, hostile action, good for neither party, might be taken.

If no central body of surveyors exists with power to deal with this and kindred matters, it is time such a body be created, for this question must be dealt with promptly, and by the surveyors themselves, if they wish to remain masters in their own house.

All other professions worthy the name are year by year making the qualifications of their members higher and more responsible, their rule of conduct more stringent, and the punishment of any infraction of rule or conduct more severe. If reform does not proceed from inside the body, more drastic measures may be forced on from outside.

But I hope the community of interests will enable surveyors and builders to meet together and take counsel in the old friendly manner to devise a way out of the present trouble, and to establish some permanent settlement of the various difficulties which now exist,—an arrangement which will tend to make architect, surveyor, builder, and employer equally useful links in a chain of mutual helpfulness, every one doing his part to uphold the high position which the great and good old trade of building ever should occupy.

#### THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

THE Sanctuary of Asklepios, on the south side of the Akropolis, formed the subject of the fourth of Miss Harrison's lectures on Nov. 23. The god Asklepios, the Roman Æsculapius, has till lately been known to us in art only from rather uninteresting representations of the Greco-Roman period; and perhaps we have been accustomed to think of him as the rather dull though respectable prototype of the modern physician. The excavation of the Asklepieion at Athens, in 1875, and, above all, the recent excavation of the great shrine at Epidaurus (referred to in the last lecture) have let in a flood of new light on the subject. Asklepios is now shown to be a genuine, old-fashioned divinity, and his worship, as the lecturer put it, no longer pointed to a second-rate medical science, but to a first-rate superstition. In order to arrive at a clear notion of the personality

\* "Priestley & Gurney v. Stone"; see *Builder*, last volume, pp. 50, 68, 70; and current volume, pp. 75, 88, 126, 162, ante.



of the god, Miss Harrison went into a somewhat minute investigation of the Epidaurous genealogy of the god given to us in the great *Igyllos* inscription. Asklepios should be kept completely distinct from Apollo, whose son he was made only in later traditions. These had doubtless an Ionian and Delphic source. The priests of Apollo, jealous of the celebrity of *Æsculapius*, and fearing he should entrench in some of his attributes on the worship of Apollo, determined, since it was impossible to oust him, to insist on a joint worship of the deities, by making Apollo father to Asklepios (see Pindar, *Pyth. III.*). An examination of the art types of the god show him to be very unlike Apollo. He is more often represented as a middle-aged god of the Zeus type, with the lower part of the body fully draped, holding a staff entwined by a snake. The snake here was no emblem of immortality, but just as in the case of the *Kerukeion*, or herald-staff of Hermes, marks a connexion with the powers of the under-world.

From the remains of the precincts of Asklepios, as well as from literary tradition, we find the same general features, whether at Athens, Epidaurous, or Sicily. The whole enclosure was of the nature of a hospital. It contained invariably the shrine proper of the god, a well of good water, a most important and distinctive feature of the cultus, and a stoa for the patients to walk in. The celebrated passage in Aristophanes (*"Plutus"* ll. 627, *seq.*), although a comic exaggeration, shows the popular beliefs with regard to the ceremonies to be performed in order to be cured by Asklepios. First, there was a purification by water, next followed the *incubatio*, and sleeping in the temple, when Asklepios, often accompanied by his children, would reveal to the sufferer in a dream how he should be cured of his disease. Very entertaining are some of these prescribed "cures," as we gather them from inscriptions set up by grateful patients. The most notable of all these inscriptions does not come to us from Athens, but from Epidaurous. It was set up by a certain M. Julius Apellas, who "suffered from many diseases, and especially from indigestion." The first advice the god gave him was sound enough; it was not to be so nervous about himself. Then Apellas proceeds:—"The god ordered me to eat bread and cheese . . . to use the bath . . . after the bath to rub myself against the wall . . . to go bare-foot . . . to pour wine into the hot water before I got into the bath—and to give the attendant an attic drachma!" And once the god ordered him to put honey into his milk, "that it might be easier of digestion." At the end, the priest of Asklepios says to him, in a businesslike way, "you are cured, and now you must pay your fee." Extremely interesting and quaint are some of the *ex-votos* from the Asklepieion of Athens. One inscription is set up by an Athenian cook, in gratitude for a miraculous cure. Another tablet shows, carved in relief, a box of surgical instruments, dedicated by the doctor who had successfully accomplished some operation. Another shows a pair of ears, offered by some patient cured of the ear-ache. A more dignified, but scarcely so entertaining, series of offerings consist of reliefs representing Asklepios himself, sometimes standing, sometimes seated, accompanied by his children, and at times also by the Eleusinian deities Demeter and Kore, with whom his cult was closely connected. In conclusion, Miss Harrison showed how, in earlier and more heroic times, Asklepios was rather a god of divination than a god of medicine. Plato, we know, thought it a disgrace that men who could by exercise keep their bodies healthy should be obliged, except in the case of a wound, to have recourse to a doctor. Later, this healthy tone disappears, morbid views of illness are taken, even convalescence has its god *Troilos* called in to help Asklepios. The shrines of Asklepios are thronged with votaries; and in Italy, in the age of the Antonines, the worship of the god of medicine reached its highest pitch. Men believed that even diseases of the soul might be reached through the channel of the body, especially when the body was inactive, and its forces dulled by sleep.

#### THE FALL OF BUILDINGS AT THE WEST-END.

On Tuesday the Coroner for Central Middlesex, Dr. G. Danford Thomas, resumed his inquiry into the causes of the deaths of the six men who were killed by the fall of the buildings in course of construction in Great Titchfield-street, Marylebone, on Friday, the 9th ult., as mentioned in the *Builder* for the 17th ult., p. 363.

We take our report of the evidence from the *Times*.

John Richards, foreman of the works, was recalled, and said there were thirty-eight men employed in the building. The sand used in mixing the mortar was obtained from Fulham and Kensington, and the work was being carried out in accordance with the specification, under the direction of Mr. Miller, the architect, by whom it was drawn. The mortar was good and the bricks good stock bricks. Mr. Miller himself acted as clerk of the works, and the District Surveyor visited the building on several occasions. The ground floor was shored up because they wished to place bricks upon it, and as a fact some 35,000 bricks were placed on it; the work of the shoring was done by the navvies. It was usual to stack bricks on the flooring when they had a limited space. He could not tell the weight of 35,000 bricks.

The Coroner.—If that be the case, how could you form a judgment as to what shoring was required?

The witness said he would use his own judgment. At the time of the accident there were only some 3,000 or 4,000 bricks on the flooring. The shoring was removed in accordance with the weight of the bricks, and at the time of this occurrence all the shoring had not been removed. They did not use any of the soil that was taken out of the building for the purpose of making mortar. It was all carted away from the building.

Robert Williams, who described himself as travelling foreman to Messrs. Oldrey, said it was his duty to go from job to job to see and report upon the progress of the work. He visited the buildings in Great Titchfield-street, and considered the work was going on satisfactorily. During the progress of the building no complaints were made to him by any of the men. He considered the mortar and other materials very good.

Mr. Walter James Miller, architect and surveyor, said he had been in practice sixteen years, and prepared the plan and specification for the building which had fallen, and visited the building two or three times a week. There was no clerk of the works, as it was not of such magnitude as to require one. The contract was signed on Aug. 13, and the work was to have been completed in seventeen weeks. After the contract had been signed the old building was pulled down, and the clearance was made in about four weeks. Only a few bricks were used in the new building. He did not see the foundations made because he was away on his holidays, and that work was superintended by his assistant, Mr. Friesland. His chief duty was to see that all witness's plans were carried out. He returned to the work on October 8 and found that it had progressed up to the first floor, and he approved of what had been done. He visited the building occasionally from that time till this occurrence took place, some three or four hours a week. From what he saw he had no fear whatever about the safety of the building. He noticed the flooring was shored up owing to bricks being upon it. Thirty-five thousand bricks would weigh between 70 and 80 tons, and if the shoring bar was not complete it would cause extra weight to be put on the walls.

In cross-examination, Mr. Miller stated that the building had been erected in accordance with the plans and specification with one exception, which was with regard to the depth of the ground, and that was only slight deviation. He had not formed any decided opinion as to the cause of the accident, but he thought it might be possibly caused by loading the floor with the bricks, causing the wall to become ruptured or receive a shock before the wall had become properly set. He found that some parts of the wall had only been bonded by half bricks instead of whole ones, but he did not think this caused the accident.

At this stage of the proceedings the Court adjourned till Wednesday next.

**The London Central Winter Fund of House Decorators and Painters.** We are asked to mention that this fund will take a "Ticket Benefit" at the Princess's Theatre from December 3 to 8, when the piece, "Hands Across the Sea," will be played. The society, we are informed, was established in 1874 for the purpose of paying a small sum weekly to its members when unemployed during the winter. Tickets only will benefit the fund. They may be had from the secretary, Mr. E. W. Blades, 28, Longford-street, Albany-street, N.W.

#### THE ART CONGRESS AT LIVERPOOL.

The following is the programme of the Congress to be held at Liverpool next week, under the auspices of the "National Association for the Advancement of Art, and its Application to Industry":—

On Sunday, December 2, Art Congress Sermons will be preached by Archdeacon Farrar at the Church of the Blind, Hardman-street, 11 a.m. and 6.30 p.m.

##### *Monday, December 3.*

4.45 p.m., Meeting of Central Committee of the National Art Association, at the Walker Art Gallery.

8.0 p.m., *Presidential Address*, by Sir Frederick Leighton, Bart., P.R.A., at the Concert Room, St. George's Hall.

##### *Tuesday, December 4.*

10.30 a.m., *Architecture*—Presidential Address, by Prof. Aitchison, A.R.A.

10.15 a.m., *Applied Art*.—Mr. W. E. Willink, A.R.I.B.A., on "The Home Arts Movement." Mr. G. H. Garraway, on "The Liverpool Art Workers' Guild." Mr. H. B. Barr, F.R.I.B.A., on "A School for the Artistic Handicrafts."

11.30 a.m., *Painting*.—Mr. James Towers, on "Encouragement of Local Art." Mr. James Paterson, on "On the Cultivation of the Love of Art."

11.30 a.m., *Sculpture*.—Mr. G. Simonds, on "The Importance of Sculpture in Civilisation."

11.30 a.m., *Museums*.—Mr. E. Rimbaud Dibdin, on "A Contribution towards the Art History of Liverpool." Mr. Charles Dyal, "Do Picture Exhibitions Promote or Impede the Progress of Art?"

2.0 p.m., *Painting*.—Presidential Address, by Mr. L. Alma Tadema, R.A.

3.45 p.m., *Applied Art*.—Mr. G. H. Morton, Jun., on "The Agreement of Colour Theories with Practice." Rev. H. O. Rawnsley, on "Country Industrial Art Schools: their Aims, Claims, and Needs."

3.45 p.m., *Museums*.—Mr. W. M. Conway, on "Reproductions of Ancient Works of Art for Municipal Museums." Lieut.-General Pitt Rivers, F.R.S., on "The Classification of Objects in Museums."

4 p.m., *Sculpture*.—Mr. R. Pinker, on "Choice of Materials for Sculptural Decoration."

4 p.m., *Architecture*.—Mr. J. D. Grace, on "The Proper Aims and Limits of the Coloured Decoration of Architecture." Mr. E. J. Tarver, on "Proposed Improvements in Theatre Planning."

##### *Wednesday, December 5.*

10.30 a.m., *Applied Art*.—Presidential Address, by Mr. Walter Crane.

11.30 a.m., *Painting*.—Mr. F. Bate, on "The Tendencies of Modern Art." Mr. R. F. Hallward, on "The Emancipation of the Picture."

11.30 a.m., *Sculpture*.—Messrs. T. Stirling Lee, and Wm. Emerson, F.R.I.B.A., on "The Decoration of Public Places and Buildings."

11.30 a.m., *Architecture*.—Mr. T. G. Jackson, M.A., on "Obstacles Opposed to the Progress of Architecture by Architects themselves." Professor Roger Smith, F.R.I.B.A., on "Architecture as Part of a Liberal Education."

11.30 a.m., *Museums*.—Mr. J. Pyke Thomson, on "The Turner House at Cardiff." Mr. Whitworth Wallis, "A Short Account of the Birmingham Corporation Art Gallery."

11.30 a.m., *National and Municipal Encouragement of Art*.—Mr. Edwin Seward, A.R.I.B.A., on "The Development of Local Influences for the Advancement of Art."

3 p.m., *Museums*.—Presidential Address, by Mr. Sidney Colvin.

3.30 p.m., *Painting*.—Mr. W. E. F. Britten, "Our Claims as Artists." Mr. H. H. La Thangue, "Art Education."

3.30 p.m., *Sculpture*.—Mr. J. B. Gibbs, on "The Influence of Sculpture on Painting." Mr. Walter Armstrong, on "The Proper Decorative Use of Sculpture."

3.30 p.m., *Architecture*.—Mr. E. P. Warren, on "The Coloured Decorations of Churches." Local Papers.

3.45 p.m., *Applied Art*.—Mr. William Morris, on "Art, and its Producer."

4 p.m. to 6 p.m., Reception by the Royal Institution in the Art Gallery, Colquhoun-street.

8 p.m., *Art Congress Soirée* in the Walker Art Gallery, Rotunda Reading Room, and the Brown Library.

8 p.m., *Concert*, Grosvenor Room, Walker Art Gallery.

9 p.m., in the Rotunda Reading Room, Mr. Henry Blackburn will show Lime-light Illustrations of English and French Modern Art.

9.30 p.m., *Cinderella Dance*, in the Brown Library.

##### *Thursday, December 6.*

11.30 a.m., *Combined Meeting of the Sections of Painting, Architecture, and Applied Art*.—Mr. G. F. Watts, R.A., and Mr. J. D. Sedgwick, F.R.I.B.A., will take part in the proceedings, and Mr. G. T. Robinson will speak on "Sgraffito and other Processes of Decoration in Plaster."

11.0 a.m., *Sculpture*.—Mr. E. Onslow Ford, on "The Modern Realistic School." Mr. Samuel Fry,



on "Architectural Carving." Professor W. C. Roberts-Austin, on "The Precious Metals." 11.30 a.m., *Museums*.—Mr. George Wallis, on "The Economical Formation of Art Museums for the People." Mr. Walter Armstrong, on "Logic in Art: A Plea for Decoration." 3 p.m., *Sculpture*.—Presidential Address, by Mr. Alfred Gilbert, A.R.A.

3.45 p.m., *Applied Art*.—Mr. Lewis F. Day, on "Fashion and Manufactures." Sir Philip Magnus, on "The Teaching of Industrial Art." Mr. T. Cobden Sanderson, on "Craft Ideals" 4 p.m., *Painting*.—Mr. John Brett, A.R.A., on "The Relation between the Pictorial and the Decorative Arts."

4 p.m., *Architecture*.—Mr. Basil Champneys, B.A., on "Style." Mr. H. H. Statham, F.R.I.B.A., on "Nature and Architectural Ornament."

4 p.m., *Combined Meeting of the Sections for Museums and National and Municipal Encouragement of Art*.—Mr. T. C. Horsfall, on "The Importance of Connecting Elementary Schools with Art Galleries." Mr. P. H. Rathbone, on "Lessons from France."

8 p.m., *Conversations at the Liverpool Art Club.*

Friday, December 7.

10.30 a.m., *Combined Meeting of the Sections of Sculpture, Architecture, and Applied Art*.—Mr. G. Simonds, on "Sculpture, and its Relation to Architecture." Mr. J. Belcher, F.R.I.B.A., on "The Alliance of Sculpture and Architecture." Mr. J. D. Sedding, F.R.I.B.A., will also take part in this meeting.

11.30 a.m., *National and Municipal Encouragement of Art*.—Professor Baldwin Brown, on "Mural Painting." Mr. Patrick Geddes, "Economic Arguments for the Encouragement of the Fine Arts."

3.0 p.m., *Painting*.—Mr. W. B. Richmond, A.R.A., on "A Strict Method for Study of the Human Figure."

3.0 p.m., *Architecture*.—Mr. J. J. Stevenson, F.R.I.B.A., on "The Planning of Towns." Mr. J. J. H. Summers, F.R.I.B.A., on "The Practical Outcome of the Art Congress."

4.0 p.m., *National and Municipal Encouragement of Art*.—Presidential Address, by the Right Hon. A. J. Mundella, M.P.

8.0 p.m., *Conversations at Streatham Towers*, Princes-road, the residence of Mr. and Mrs. James L. Bowes (by invitation).

#### ARCHITECTURAL SOCIETIES.

*Liverpool Architectural Society*.—At the second ordinary meeting of the present session of the Liverpool Architectural Society, held in the Free Library, William Brown-street, on Monday evening, Sir James Picton gave an address upon the "Town Halls of Liverpool."

*Leeds and Yorkshire Architectural Society*.—The second meeting of this society for the present session was held on Monday evening in the rooms, Infirmary-street, Mr. Henry Perkin (President) in the chair, when a lecture was delivered by Mr. Arthur Marshall, A.R.I.B.A. (Nottingham), on "Old Carved Furniture and Woodwork." Art, as applied to household decoration, said Mr. Marshall, was beginning to receive more attention than it had done for many years. In his opinion an architect's duties were not confined to plans and designs for buildings, but extended to furnishing and decoration, arguing that it was equally within their scope to guide public taste in this direction. Going back to the carving of the thirteenth century, he said that the examples were somewhat rude, and had few pretensions to ornamental beauty. In the fourteenth and fifteenth centuries, however, woodwork became more ornamental, and in some of our village churches there still existed some magnificent examples of chests of the latter century. Mr. Marshall gave specimens of Derbyshire and Yorkshire chairs, and described their characteristics. Settees and "thrower" chairs received attention, and the lecturer spoke of the use of pack-chests and court cupboard. Coming to tables, Mr. Marshall said that up to the Tudor period they were both rude and cumbersome. The old tables had a carved rail along one side, as it was the custom of the guests to sit on one side only, the waiting being done from the other. He commended to his hearers the revival of the art which was once exercised in the carving of doors, fireplaces, and overmantels. Having described some of the ancient beds, Mr. Marshall said it had been argued that old furniture was unsuitable to modern requirements; but, if looked upon from the standpoint of those who attached greater importance to stability and ornamental effect and comfort, it must be viewed in a different light. He often wondered at the want of taste manifested by many people in the selection of their furniture. He warned his hearers against forgeries of old furniture,

which he said were largely carried on, and spoke with commendation of the efforts which were now being made in some of our technical schools to revive the art of carving. A vote of thanks was accorded to Mr. Marshall for his lecture, on the motion of Mr. Herbert Hodgson, seconded by Mr. Butler Wilson.

#### AUTOMATIC SPRINKLERS.

SIR,—In your issue of September 22 you describe a form of automatic sprinkler for the prevention of the spreading of fires in buildings, and as just now attention is being drawn to this subject, I should be glad if you would permit me to state that twenty-four years ago, viz., in 1864, I went over this ground very carefully, and, as the result, invented and exhibited a sprinkler that is to-day admitted by the highest American authority on the matter to anticipate (in Americanese, "knock the bottom out of") every patent ever since taken out for this kind of article.

I enclose circular printed about September, 1865, with drawings, from which you will see that the whole question was threshed out, and nothing left to be done but to adopt the valve, and thus save millions of valuable property, since unhappily destroyed. But the ultimate result to me, however, was melancholy enough. After spending every month after month, and about \$800, in cash, in experiments and advertisements; after sending models and descriptions to all Governments of the civilised world, and writing all the insurance authorities, persevering for years, I have never during these twenty-four years sold a single valve, or had a single serious inquiry as to its merits or use.

It was not patented or protected in any way, and anybody could make or sell it, still I never sold one, not even as a pattern for some one else to make them from.

The fact was that the public mind was not awake to the importance of the question, and it needed American acuteness to see that loss by fire was covered by insurance.

The truth grasped at last, the automatic sprinkler began in various forms to take over there, and there they sell by millions, and now even here there are hundreds of mill-owners and others paying premiums and royalties to Americans, who could at any time during a quarter of a century have had the same thing from an Englishman for the cost of making.

\*\* Mr. Harrison's pamphlet and illustrations enclosed appear to bear out his claim. We are inclined to think he would have had a better chance of success if he had patented his invention. Many tradespeople, we believe, do not think much of an invention unless it is patented.

A. STEWART HARRISON.

#### COMPETITION FOR HOTEL AT DOUGLAS.

SIR,—Permit me to inform the correspondent who writes in last week's issue of the *Builder* [p. 382] concerning the competition put forth last year by a Mr. Louis Kelly, of Douglas, Isle of Man, of my experience in regard to the same.

After receiving the very gorgeously-coloured block plan and the particulars, I sent my design in at the appointed time, and, after the interval of six weeks or so, I wrote, asking for the decision, thinking that it must have been decided;—I received a letter, which I regret I have not kept, but which was to the effect that the gentleman to whom the drawings had been entrusted had not made known his decision yet, which would be communicated to me as soon as he did so. After the receipt of which a considerable period intervened, until I received my drawings, with the following letter, written, presumably, by Mr. Kelly's clerk, which I have fortunately kept:—

"Broadway, Douglas, Isle of Man, Feb. 11, 1888,  
R. Comp. Plans.

DEAR SIR, The prize has been awarded to Mr. Pennington, of Southport, and Ramsey, Isle of Man. I return your drawings per this post, and remain, dear sir, yours truly,  
Joi. D. Rogers, for Louis Kelly."

Concerning which I think your correspondent will agree with me that further comment is unnecessary.

H. D. W.

#### COLFE GRAMMAR SCHOOL COMPETITION.

SIR,—Last week's issue of the *Builder* contains an advertisement of mine for tenders, "Colfe Grammar School, Lewisham," which gave most of your readers and doubtless the other competitors the idea I had been appointed architect to the above school. In fairness to the other three competitors (Messrs. Giles & Gough, London; Messrs. Clark & Moscrop, Darlington; and Mr. H. T. Bonner, London), permit me to say such is not the case.

The explanation is that the four selected competitors have been instructed by the tenders of the Leathersellers' Company to obtain tenders for their respective designs. The advertisement is corrected this week.  
E. LYNE PARSONS.  
Exeter, Nov. 28.

#### The Student's Column.

##### ARTIFICIAL STONES.—XXII.

Methods of Indurating Artificial Stone by Exposure to Gases.

THE special methods for hardening or accelerating the induration of artificial stones by exposure to carbonic acid and other gases may now be briefly enumerated.

M. Claudot patented in 1855 a marble-like stucco or artificial stone composed of slaked lime mixed with water highly charged with carbonic acid. This may be directly applied to walls, &c., as a kind of plaster, or artificial stone may be formed by mixing the lime with powdered shells, sand, and similar substances with as little water as possible, and pressing the mixture into moulds. When dry the stone is exposed in a closed chamber to an atmosphere of highly compressed carbonic acid gas.

Picker, in 1867, also employed carbonic acid gas for indurating lime containing artificial stones by exposing it for long periods to its influence. Hyatt, in a portion of his specification, published in 1873, mentions carbonic acid gas as an indurating material; and in 1874 Freussier patented arrangements for producing artificial stones from mixtures of sand and lime, which, after being moulded, are subjected in chambers to the action of carbonic acid gas drawn direct from the lime-kiln. H. J. Allison, according to his patent (1884, pat. 16,000), hardens or carbonates in some cases his artificial stone mixtures by exposure to the action of carbonic acid gas in closed chambers or dissolved in water.

In 1882 W. Walker made a new departure by utilising, for the purpose of improving artificial stone, what he calls "Sulphureted Steam," obtained by passing steam through granulated or powdered sulphur; and the same year J. W. Butler proposed to utilise a mixed atmosphere of sulphur steam and carbonic acid gas for the same purpose.

The *raison d'être* of these patents is apparent: the carbonic acid gas is to unite with the lime to form carbonates, and the sulphur compound ultimately, by oxidation, produces sulphate.

##### Mechanical Devices for Improving and Binding Artificial Stones.

The chief mechanical devices which have been adopted with a view to accelerate the induration of artificial stone, or to bind together the components of the stone, or structures formed therefrom, are the following:—R. Thompson, in 1853, prepared perforated building stones from blue lias lime, or strong grey lime fresh from the kiln, mixed with sharp sand, cement, and gravel, and moulded while still hot, the mould being perforated to admit of rods being run through the composition, and withdrawn after it has set; the surface, if proper sand has been used, can be made to closely resemble that of Portland stone, while, owing to the numerous perforations admitting air to a greater surface than would otherwise be possible, the bricks become extremely hard.

In L. D. Owen's patent (1856, pat. 1,270) the bricks or stones are formed of sand and lime, pressed into moulds strongly, and perforated thoroughly with the same object, as in the last patent, so that the blocks become unusually hard, and in a few months can hardly be distinguished from good sandstone.

The manufacture of cornices, blocks, window-heads, and other builders' requisites, patented by Eccles in 1859, involved the employment of clay earths, worked up with water, and moulded with as many holes throughout their mass as possible, dried in currents of air, and finally baked.

C. Pasquin, in 1864, patented the manufacture of keyed artificial stone, and Arntz, in 1873, also secured protection for artificial stones formed with tongue and groove, so that in building they can be locked together without cement. Several other patentees have worked at the same idea, but with no very important results.

Several patents relate to the mingling with the stone composition wires or fibres in order to increase its toughness. Highton, in 1868, introduced fibrous or metallic substances into the body of his stone, for the purpose of rendering it tougher and difficult to break.



Brannon (1874, pat. 1,246) arranged an imbedded sustaining frame or selvage, and a strained webbing to permeate the mass of concrete or cement; in the formation of these arrangements rope, cane, and cordage may all be employed, and stone so strengthened and sustained is termed by the inventor "Lignolithite."

## RECENT PATENTS.

## ABSTRACTS OF SPECIFICATIONS.

15,476, Ventilating. E. Loftis.

According to this invention heated pipes or tubes are used, and the influx of air thus created is distributed without draught.

17,199, Drying Timber, &c. J. H. Shorrock.

By this invention a self-acting stove is used, and the timber is placed over a perforated, or latticed, bottom, beneath which the air being drawn from the stove through apertures in an air-pipe attached to a chimney, the draught of which draws the atmospheric air through the inlets to the stove continuously day and night. Suitable arrangements are provided for carrying away the liquids collecting below the perforated or lattice bottom in the process of drying.

2,886, Sash and other Pulleys. F. J. J. Gibbon.

A small wheel or pin is, according to this invention, cast upon the pulley, and falls into a longitudinal recess. The pin usually fixed in the pulley is thus dispensed with.

10,913, Drain-Traps. G. Davis.

According to this invention, the configuration of the ordinary drain trap is somewhat altered, and the trap is also fitted with a hinged grating. In the side walls suitable openings are made which form the trunnion bearings. A cap covers the grating, and also the pipe which contains the grating. The cap is pierced with a hole a trifle larger than the horizontal dimensions of the grating.

12,734, Wood Screws. C. D. Rogers.

This relates to an improvement in the mechanism for making wire-drawn wood screws, and is applicable to forming the heads of the screws, which is done by means of hammers having specially-shaped recesses formed upon their faces. As soon as the blank head is made, the slot across the face of the head is cut by a suitable tool. The metal forming the head of the screw is also compressed between dies to give greater strength.

12,830, Sash-Balance. J. McChesney and A. T. W. Cobham.

In order that the sash or shutter may be easily lifted, the sash pulley is by this invention fitted with a coiled spring in the interior, which, when the spring is wound by the fall of the sash, exerts its force and assists it in rising so soon as the sash is lifted.

## NEW APPLICATIONS FOR PATENTS.

Nov. 16.—16,632, D. Jones, Closing the Prosecution Openings of Theatres, &c.—16,665, A. Boulé, Air-tight Lids for Closets.—16,687, J. Burn, Sash Fasteners.

Nov. 17.—16,704, A. Mattison, Ceiling Hook.—16,729, F. Stokes, Finger-plates for Doors.—16,737, T. Leblon, Mosaic Tile.—16,744, W. Wism, Greenhouses and Garden Frames.—16,753, A. Gray, Grinding Portland, Roman, and other Cements.

Nov. 19.—16,769, K. Jackson, Securing Cords to Sash Windows.

Nov. 20.—16,846, C. Allen and others, Glazing.—16,860, W. Doshering, Plastering, Laths, &c.—16,884, A. Del Guerra and D. Steffans, Securing Doors.

Nov. 21.—16,920, J. Frost, Mitre-cramp.—16,940, W. Bendall, Paint-brushes.

Nov. 22.—16,975, T. Wolstenholme, Hanging Wall-papers, &c.

## PROVISIONAL SPECIFICATIONS ACCEPTED.

12,535, J. Balbirnie, Heating, Cooling, and Ventilating Buildings.—13,915, F. Broadbridge, Window Fastenings.—14,423, H. Metcalf, Ventilating Cowl.—14,733, A. Robb, Stonemasons' Points and Chisels.—14,900, T. Paxton, Attaching Door-knobs to Spindles.—14,957, T. Sanders, Sash and Basement Fasteners.—15,246, W. Thompson, Ventilators.—15,613, T. Penario, Water Waste Preventing Cisterns.—15,650, A. Clark, Fire Grates and Stoves.—15,680, H. Ames, Fire-places.—16,035, S. Chaloner, Lacquers and Varnishes.

## COMPLETE SPECIFICATIONS ACCEPTED.

## Open to Opposition for Two Months.

15,771, F. Crane, Varnishes.—890, E. Brett, Ventilating Apparatus for Improving Draughts in Ventilating Shafts.—1,997, E. Dupont, Construction of Walls, Partitions, Roofs, &c.—5,682, C. Jones, Window Sash Fasteners.—5,908, E. Andreoni, Closing and Flushing Water-closets.—14,556, R. Sayer, Wall Tacks.—14,998, A. Rost, Chimney-flues.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

Nov. 19.

By G. A. WILKINSON.

Southend-Thames Farm, and 73a. 3r. 26p., freehold..... £18,000  
Wapping—26, Old Gravel-lane, 34 years, ground-rent £25..... 700  
Sunbury, Staveley-road—Hamilton Cottages, freehold..... 140  
Alexandra-road—Alexandra Cottages, freehold..... 340

By Messrs. LAGGE.

Islington—8, Essex-road, freehold..... 1,100

Nov. 20.

By BEARD & SON.

Baywater—100, Westbourne Park-road, 47 years, ground-rent £3..... 450

By DEBENHAM, TREWSON, & CO.

Holborn—31, Southampton-row, 34 years, ground-rent £25..... 670  
New Barnet—Ground-rent of £30, reversion in 91 years..... 1,530

By CHRISTENTON & SONS.

Kennington—3, Durham-villas, 69 years, ground-rent £25..... 2,990

By H. H. FELLER.

City—Improved ground-rent of £770, term 59 years 12,900  
Old Bailey—Improved ground-rent of £143, term 59 years..... 2,450

Improved ground-rent of £100, term 59 years 1,750  
Improved ground-rent of £105, term 59 years 1,925  
Improved ground-rent of £220, term 59 years 3,775

Improved ground-rent of £211, 1s., term 59 years 3,225  
New Cross—Profit rental of £32, term 57 years..... 350

By H. RUTLEY.

Haverstock-hill—Ground-rent of £34, reversion in 97 years..... 675  
Holloway—42, Mayton-street, 72 years, ground-rent £5..... 240

Kentish Town—3, Market-street, 34 years, ground-rent £5..... 240  
59, Grafton-road, 70 years, ground-rent £6..... 315

In rear of above, two plots of freehold land and leasehold striding..... 280  
Holloway—63 and 69, Orpington-road, 89 years, ground-rent £10..... 270

Nov. 21.

By GIDDER & TURNER.

Wotton, Surrey—The freehold residence, Leylands, and 38 acres..... 4,550

By A. WALTON.

Stockwell—61, Aytoun-road, freehold..... 800  
Hackney—40, Swanwell-street, freehold..... 410

By J. BAKER & SON.

Kilburn—29, 31, and 33, Brixington-road, 86 years, ground-rent £15..... 1,550

By E. J. TABOR.

Wokingham—7, Wellington Brewery, with plant, and numerous out-houses..... 16,150  
Maidenhead—The Hand and Flowers public-house, 76 years, ground-rent £15..... 1,450

"The Free House," in East-street, freehold, subject to a life aged 93 years..... 850  
St. Luke's-road—The Norfolk Park Post-office, long leasehold..... 800

Nov. 22.

By H. J. BROMLEY.

Penge—An improved ground-rent of £32, term 39 years, and to the full term for 28 years..... 720  
Forest Hill, Perry Vale—Kemble House, 89 years, ground-rent £2, 18s..... 250

By HOWELL, SON, & BORNEM.

South Kensington—25, Clapham-road, and stabling, 84 years, ground-rent £44, 10s..... 4,500

By C. D. LEVY.

Bryanston-square—131, Seymour-place, 40 years, ground-rent £21..... 675

By C. & T. H. MOSE.

Mile End—65 and 67, Grafton street, 41 years, ground-rent £6, 8s..... 580  
45, St. Peter-street, 42 years, ground-rent £3, 8s..... 285

By POCKEY & FRANK.

Old Ford—"The East of Evesham," 1 acre, freehold..... 2,630  
73 and 75, Elmestere-road, freehold..... 700  
21, 23, and 25, Chisenhale-road, freehold..... 1,150

## MEETINGS.

FRIDAY, NOVEMBER 30.

Architectural Association.—Mr. J. L. Robinson, on "The Development of Irish Architecture from the early Celtic work to the Eighteenth Century." 7.30 p.m.

SATURDAY, DECEMBER 1.

Association of Public Sanitary Inspectors.—Mr. D. Richards on "A Few Characteristics of the Three Principal Animals used for Human Food." 6 p.m.

MONDAY, DECEMBER 3.

Royal Institute of British Architects.—Mr. Francis Hooper on "The Control of Building Operations in Paris, and its effect on the Architecture of the city." 8 p.m.  
Art Congress at Liverpool.—For programme, see p. 399 of this week's Builder.

Society of Engineers.—Mr. W. Worby Beaumont on "High-pressure Steam and Steam-engine Efficiency." 7.30 p.m.

London Institution.—Professor Sylvanus Thompson, D.Sc., B.A., on "The Colours of Polarised Light." 1.5 p.m.

Society of Arts (Cantor Lectures).—Captain W. de W. Abney, F.R.S., on "Light and Colour." 8 p.m.

Royal Institution.—General monthly meeting. 8 p.m.

Clubs of Work Association.—Paper by Mr. G. Dalton, on "Carpentry." 8 p.m.

TUESDAY, DECEMBER 4.

Art Congress at Liverpool (continued).  
Institution of Civil Engineers.—Mr. J. Oliver Arno, F.C.S., on "The Influence of Chemical Composition on the Strength of Bessemer Steel Tires." 8 p.m.

Birmingham Architectural Association.—Mr. C. E. Ponting, F.S.A., on "Edington Church, Wilts."  
Manchester Architectural Association.—7.30 p.m.  
Glasgow Architectural Association.—Mr. W. Fraser on "Jedburgh Abbey."  
Society of Biblical Archaeology.—Papers by Mr. P. le P. Renouf and Dr. Wiedemann. 8 p.m.

WEDNESDAY, DECEMBER 5.

British Archaeological Association.—1. Mr. J. T. Irvine on "Discoveries at Peterborough Cathedral." 2. *Review* of the Glasgow Congress, by Mr. T. C. Morgan, F.S.A. 8 p.m.

Art Congress at Liverpool (continued).  
Civil and Mechanical Engineers' Society.—7 p.m.

Society of Arts.—Mr. Henry Edmunds on "The Graphophone." 8 p.m.

Builders' Foremen and Clerks of Works Institution.—8.30 p.m.

THURSDAY, DECEMBER 6.

Art Congress at Liverpool (continued).  
Royal Archaeological Institute.—(1) Mr. J. P. Harrison on "The Shrine of St. Frideswide"; (2) Three Papers by Mr. F. C. J. Spurrell. 4 p.m.

Sanitary Institute.—Sir Douglas Galton, F.R.S., on "The Future of the Amalgamated Societies, the Parks-Museum and Sanitary Institute of Great Britain." 5 p.m.

Society of Antiquaries.—8.30 p.m.

FRIDAY, DECEMBER 7.

Art Congress at Liverpool (continued).

## Miscellaneous.

British Archaeological Association.—The first meeting of this Association for the session was held on Wednesday, the 21st ult., the chair being occupied by the Rev. S. M. Mayhew.

Mr. C. Lynam exhibited a singular flat plate of copper, on which were engraved two seal-like medallions, one representing David with the harp. It is of thirteenth-century date, and was found in Staffordshire. Mr. Harris described some remarkable interments which have been found in the chalk near Havant. They consist of pit-like cavities, 20 ft. deep and 4 ft. square. At the base are traces of burnt matter and bones. Mr. Loftus Brock, F.S.A., exhibited old engravings of the great seals of William and Mary, and of William III. Mr. Earle Way described a large number of fragments of Roman pottery, recently found near St. George's Church, Southwark. Mr. J. W. Grover, F.S.A., exhibited a magnificent thirteenth-century cross, of brass, with Limoges enamel and jewels. It is the property of Mr. Conrad Cooke, and is in perfect preservation. The Rev. S. M. Mayhew exhibited a fine series of antiquities, among which may be noted a vase found near Bethany, an impression of the great seal of Charles I., an old miniature of Charles I., and many personal relics of William III. A paper was then read by Dr. Joseph Stevens, of Reading, on an early British cemetery, which has recently been discovered and excavated at Dummer, Hants. The site is at Middle Town Field, 655 feet above the sea level, and close to an ancient trackway leading from Winchester to Litchester. The bodies have been burned, and the bodies arranged in rough, hand-made urns, inverted over the remains. Fourteen or fifteen urns have been found at a distance of only a foot below the present level. There were no signs of any tumulus. The second paper was by Mr. H. Syer Cuming, F.S.A. Scott, on personal relics of King William III. The paper described a vast number of rings, books, and other articles formerly belonging to the king, now in various collections.

India-rubber Pavement.—Herr Busse, of Linde, is introducing in several towns of Germany the use of india-rubber for paving streets. He laid down such a pavement for the first time last year on the Goethe Bridge, in Hanover, which has a surface of 1,000 square metres, or 10,764 square feet. The new pavement, it is stated, proved so satisfactory that 1,500 square metres (16,146 square feet) of ordinary carriage-road in the city were laid in india-rubber this summer. The Berlin corporation, having apparently satisfied itself of the value of the new pavement, has had a large area on the Lützow-Ufer paved with india-rubber, as an experiment, and the magistracy of Hamburg is likewise trying the pavement. It is asserted that the new pavement combines the elasticity of india-rubber with the resistance of granite. It is also said to be perfectly noiseless, not affected either by heat or cold, and not so slippery as asphalt. As it is further stated that it is more durable than the latter, it ought to prove a formidable competitor; but nothing has been made public as yet as to its comparative cost.

The "A. A. Lyric Club."—We are asked to say that the first concert under the auspices of this Club will take place at Anderson's Hotel on December 6 (not December 8, as previously announced in error), at 8 p.m.



**The Plumbers' Company.** On Monday evening the Master (Mr. W. H. Bishop) and Court of the Plumbers' Company entertained a large company at Saddlers' Hall. The Master, in the course of the proceedings, referred to the work of the Company in the cause of sanitary reform, and said that in the metropolitan area in the period between 1854 and 1864 the increase of houses was 88,112; from 1864 to 1874 it was 141,472; and from 1874 to 1884 it was 190,841. In the period from 1854 to 1864 there were 28 new houses built every day; from 1864 to 1874, 45 houses; and from 1874 to 1884, 60 houses. At such a rate of increase as that, how great was the need of sanitary and other arrangements connected with the water-supply and the health of this vast city! It was impossible to read the report of the Congress of London and Provincial Plumbers of 1884 without being convinced that in the belief of the plumber his work was not being carried out efficiently, and now they had a union of three interests—the general public, the master plumbers, and the operative plumbers,—all working in complete accord. In 1886 the Company opened a list for the registration of plumbers. In the session 1886-7 they had 580 applicants; 1887-8, 730; and in the current session 2,740, of which about 1,000 were received since July. Many facts pointed to the need of such a system of registration. For instance, in some of the examinations as many as 75 per cent. of the applicants had failed to pass. — At the examinations of plumbers for registration on Saturday last, at the Guilds Institute, applicants were present from various parts of London, as well as from towns in Kent and Essex. The examinations embraced tests of joint-making, lead-laying, &c., and a series of questions relating to the qualities of materials, the construction of various forms of house fittings, and the principles of sanitation. The examiners were Messrs. C. Hudson, C. T. Millis, J. C. Ashdown, G. Davis, and L. F. Gilbert, the last representing the United Operative Plumbers' Association. One third only of the applicants succeeded in passing the examinations.

**Property for Sale.**—On Wednesday, December 5, at the Mart, by order of the late Mr. R. M. Lumley's trustees, Oatlands Dairy Farm, in Walton-on-Thames and Weybridge parishes. This comprises nearly 130 acres of meadow, arable, and wood land, with farmhouse and other tenements, whereof the lease will expire at Michaelmas, 1895. The property, watered by the Broadwater Lake, once formed part of the Oatlands Park Estate, seat of the Duke of York, and of his widow, the charitable and eccentric Duchess. Oatlands was acquired by Henry VIII. from the family of Rede in exchange for Tangridge Manor, in the same county. It was settled by Charles I. upon his consort, who here gave birth (1640) to their youngest son, Henry of Oatlands, in a house by the later kitchen garden, which was pulled down in Cromwell's time. The Queen returned to Oatlands after the Restoration, and at her death Charles II. leased it to Lord St. Alban's. William III. bestowed the fee simple upon Arthur, Earl of Torrington, who demised the greater part of his estates to Henry (Clinton), seventh Earl of Lincoln. Henry, ninth Earl of Lincoln, inherited in 1768 the Dukedom of Newcastle-under-Lyme at the death of his wife's uncle, Thomas Holles. His son and heir, Thomas, third Duke of Newcastle, sold Oatlands to the Duke of York, who, under an Act of 1804, bought the entire rights possessed by the Crown, and made considerable additions, including Brooklands, to the estate. In 1793 was destroyed by fire the mansion which Henry, seventh Earl of Lincoln, had erected. It was rebuilt on a very extensive scale by Holland, and of late years served, like Bentley Priory, for a hotel. The park gateway, towards Walton, had for inscription: "Henricus, Comes de Lincoln, hunc arcum, opus Ignatii (sic) Jones, venustate corruptum, restituit."

**The Church of St. Mary-le-Strand.**—As will be seen by an advertisement which appears on our front page, a meeting is to be held at King's College on Wednesday next, to consider the present deplorable condition of this church.

**Alderman Saunders.**—At the meeting of the Court of Aldermen, on Tuesday last, the Town Clerk read a letter from Mr. Alderman Saunders resigning, which was unanimously accepted.

**Robert Boyle & Son, Limited.**—The third annual general meeting of this company was held at the Cannon-street Hotel on the 21st ult. Mr. Gilbert Wood presiding. The Secretary (Mr. J. A. Dargus) having read the notice convening the meeting, the Chairman moved the adoption of the report, which recommended a dividend of 12 per cent. Mr. H. P. Stebbing seconded the resolution. There being no questions, the report and accounts were unanimously adopted. The directors and auditors having been re-elected, Mr. Stebbing proposed a vote of thanks to the chairman and directors for their excellent management of the business during the year. Mr. Eckstein seconded the resolution, pointing out as a satisfactory feature of the management of the company the small amount down for bad debts in the accounts submitted. The resolution was unanimously carried. Mr. Robert Boyle, in acknowledging the vote on behalf of the board, said:—I am glad to say that the demand for the various ventilating appliances manufactured by the company continues to increase both at home and abroad, which may be said to be owing, to a considerable extent, to not only our constant efforts to meet the requirements of our clients, but to the well-proved superiority of the latest improved form of the "Air Pump Ventilator," patented in 1882, which is much more efficient and reliable than any of the previous forms, and is now sold at about 50 per cent less than the inferior forms formerly manufactured; at the same time, the ventilators are now made of a more ornamental character, and of the best rolled steel plates, galvanised, and painted with enamel paint, whilst the workmanship is of the highest class. Though this, of course, has very considerably reduced our profit on each article, the remarkable increase in the sales, which has resulted from thus reducing our prices to a minimum whilst providing nothing but what is of the best quality, has enabled us to not only again pay a dividend of 12 per cent., but to place one-sixth of the profits to the reserve fund, besides carrying a substantial balance, £1,248. 11s. 1d., forward to next year. The orders and sales for the past year show, I am pleased to say, a very satisfactory increase on the previous year, though that year was an exceptionally good one, whilst the profits are increased in proportion.

**The English Iron Trade.**—The English iron market displays a better tone, the weakness which showed itself during the last two or three weeks having disappeared. This must be looked upon as a favourable sign, considering that we are now in what is generally the duller period of the year. He would be rash, however, who would expect any decided improvement before the opening of the new year. Pig-iron, although not largely dealt in, has firmed during the week. The Scotch warrant market has slightly revived, its tendency having been upwards. There has been more animation in the pig-iron trade of the North of England, and the Lancashire market keeps steady, although business is slow. An even current of trade rules in Staffordshire. There is a better tendency in the hematite iron trade of the north-west. The finished iron market has somewhat quieted down, but there is no giving way in prices on the part of manufacturers; if anything, they are inclined the other way. The tinplate market is steady and better in tone, the inquiry being good. The steel trade is brisk in nearly all its branches, with a large amount of work in the hands of makers. Shipbuilders do not report any falling off, while engineers enjoy a good run of work.

**Brandon Creek Bridge.**—Mr. Dodman, of King's Lynn, having relinquished his contract for constructing the new steel and iron bridge over the river near Littleport, Isle of Ely, the construction of the work has been placed in the hands of Mr. Archibald D. Dawney, Assoc.-Mem. Inst. C.E., who will shortly make a commencement. Messrs. Thackray & Son, of Huntingdon, are the contractors for the restoration of the abutments. The new bridge will consist of outside steel parallel girders, 6 ft. deep, steel fish-belly cross girders, and a deck of Mallet's buckled plates, riveted down. The roadway will be finished with wood paving instead of the usual "metal." The old bridge was formed with cast-iron segmental arches, of very good design, and had been built exactly fifty years, but was found quite inadequate to the present traffic, which includes heavy traction-engines. The reconstruction is being carried out from plans by Mr. R. Reynolds Rowe, M. Inst. C.E., Surveyor to the Isle of Ely, and Mr. T. H. B. Heslop, C.E., Surveyor to the County of Norfolk.

**Large Sale of Ground Rents in the City.**—The sale of the leasehold ground rents, last week, in Fleet-lane and the Old Bailey, secured on the premises of Messrs. Cassell & Co., brought together a numerous company at the Auction Mart. The sale had been necessary under the will of the late Mr. Petter, one of the partners, who was the owner, apart from the firm itself, of the ground rents. Mr. Herbert Fuller conducted the sale. The rents submitted amounted to 1,549l. per annum, the estimated value of the rack rents being about 6,000l. a year. They were offered in nine lots, all of which were sold. The most valuable of the lots was a ground rent of 770l. per annum on an unexpired lease of fifty years. For this lot there was a close and animated demand. It was put up at 8,000l., and was ultimately purchased by Mr. Wood, on behalf of Messrs. Cassell & Co., Limited, for 12,500l. The next highest price was 3,225l. for a ground-rent of 211l. per annum, also on an unexpired lease of fifty years. The total proceeds of the sale amounted to 26,375l. It should be stated that the late Mr. Petter had become the freeholder of the land, which he from time to time leased to the firm and subsequent company for building upon.

**The Knighton Girls' Home.**—This new building, situate at Woodford Wells, Essex, erected for the Society for the Rescue of Young Women and Children, was opened on the 22nd ult. by a dedication service. The new building has been erected on the site of the old home, burnt down in January last, and is four stories high, faced with brick with stone dressings. It is designed to accommodate forty-five girls, with the necessary class, work, bath, dining, and other rooms, sick-ward, and offices, together with private rooms for the matron and staff. It has cost about 1,800l., exclusive of furnishing. The plans were prepared by Mr. Edward Tidman, C.E., of Westminster, who had a silver salver presented to him by the committee in acknowledgment of his honorary services in designing and superintending the erection of the new home. Mr. F. J. Coxhead, of Leytonstone, is the builder.

**Builders' Clerks' Benevolent Institution.**—A special general meeting of the donors and subscribers to this Institution was held at the offices, 21, New Bridge-street, E.C., on Tuesday, Nov. 27, for the purpose of electing a pensioner on the Relief Fund. The applicant was Mrs. Elizabeth Shaw, whose case had been fully inquired into, and who had been pronounced eligible by the committee. Being the only candidate, Mrs. Shaw was elected by show of hands, making up the number of pensioners now on the books to eighteen. The chair was occupied by Mr. O. K. Turpin (Messrs. Kirk & Randall), in the absence of Mr. J. W. Hobbs, the President, whose duties as Mayor of Croydon prevented his attendance on the occasion.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                                      |       | £. | s. | d. | £. | s. | d. |
|----------------------------------------------|-------|----|----|----|----|----|----|
| Greenheart, B.G.                             | ..... | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, E.I.                                   | ..... | 9  | 0  | 0  | 14 | 0  | 0  |
| Sequoia, U.S.                                | ..... | 0  | 2  | 0  | 9  | 0  | 0  |
| Ash, Canada                                  | ..... | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch                                        | ..... | 3  | 10 | 0  | 6  | 0  | 0  |
| Elm                                          | ..... | 4  | 0  | 0  | 5  | 0  | 0  |
| Fir, Dantais, &c.                            | ..... | 2  | 0  | 0  | 4  | 0  | 0  |
| Oak                                          | ..... | 2  | 0  | 0  | 4  | 0  | 0  |
| Canada                                       | ..... | 5  | 10 | 0  | 7  | 0  | 0  |
| Fine, Canada red                             | ..... | 3  | 5  | 0  | 4  | 0  | 0  |
| Lath, Dantais                                | ..... | 3  | 10 | 0  | 5  | 0  | 0  |
| St. Petersburg                               | ..... | 5  | 0  | 0  | 6  | 10 | 0  |
| Waincoat, B.G.                               | ..... | 2  | 15 | 0  | 4  | 5  | 0  |
| .....                                        | ..... | 2  | 15 | 0  | 3  | 5  | 0  |
| Deals, Finland, 2nd and 1st, std. 100        | ..... | 10 | 0  | 0  | 10 | 0  | 0  |
| .....                                        | ..... | 7  | 0  | 0  | 9  | 10 | 0  |
| .....                                        | ..... | 7  | 0  | 0  | 8  | 0  | 0  |
| St. Petersburg, 1st yellow                   | ..... | 10 | 0  | 0  | 15 | 0  | 0  |
| .....                                        | ..... | 9  | 0  | 0  | 10 | 0  | 0  |
| .....                                        | ..... | 8  | 0  | 0  | 10 | 0  | 0  |
| Sweden                                       | ..... | 8  | 0  | 0  | 16 | 0  | 0  |
| White Sea                                    | ..... | 9  | 0  | 0  | 17 | 0  | 0  |
| Canada, Pine, 1st                            | ..... | 18 | 0  | 0  | 25 | 0  | 0  |
| .....                                        | ..... | 11 | 0  | 0  | 17 | 0  | 0  |
| .....                                        | ..... | 7  | 10 | 0  | 10 | 0  | 0  |
| .....                                        | ..... | 5  | 0  | 0  | 15 | 0  | 0  |
| .....                                        | ..... | 7  | 0  | 0  | 8  | 10 | 0  |
| New Brunswick, &c.                           | ..... | 6  | 15 | 0  | 8  | 15 | 0  |
| Battens, all kinds                           | ..... | 5  | 10 | 0  | 12 | 0  | 0  |
| Flooring Boards, sq., 1 in., prepared, First | ..... | 0  | 11 | 0  | 0  | 14 | 6  |
| Second                                       | ..... | 0  | 8  | 0  | 0  | 10 | 9  |
| Other qualities                              | ..... | 0  | 5  | 8  | 0  | 7  | 9  |
| Cedar, Cuba                                  | ..... | 0  | 0  | 3  | 0  | 0  | 3  |
| Honduras, &c.                                | ..... | 0  | 0  | 3  | 0  | 0  | 3  |
| Australian                                   | ..... | 0  | 0  | 22 | 0  | 0  | 3  |
| Managua, Cuba                                | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| St. Domingo, cargo average                   | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| Mexican                                      | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| Toluca                                       | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| Managua                                      | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| Box, Turkey                                  | ..... | 0  | 0  | 4  | 0  | 0  | 4  |
| Walnut, Italian                              | ..... | 0  | 0  | 4  | 0  | 0  | 4  |



| METALS.                          |           |           | METALS (continued).         |         |         |
|----------------------------------|-----------|-----------|-----------------------------|---------|---------|
| Iron—Bar, Welsh, in London.....  | 4 17 6    | 5 0 0     | Australian.....             | 101 0 0 | 0 0 0   |
| " at works in Wales .....        | 4 7 6     | 4 10 0    | English Ingots.....         | 104 0 0 | 0 0 0   |
| " Staffordshire, in London ..... | 5 15 0    | 7 0 0     | Zinc—English sheet.....     | 22 10 0 | 23 10 0 |
| British, cake and ingot.....     | 80 10 0   | 82 0 0    | OILS.                       |         |         |
| Best selected.....               | 81 10 0   | 83 0 0    | Linsed.....                 | 15 17 6 | 19 0 0  |
| Sheets, straw.....               | 58 0 0    | 58 0 0    | Cocunut, Ceylon.....        | 27 10 0 | 28 10 0 |
| Chili, bars.....                 | 78 0 0    | 80 0 0    | Ceylon.....                 | 26 5 0  | 0 0 0   |
| Yellow Metal.....lb.             | 0 0 7 1/2 | 0 0 7 1/2 | Palm, Lagos.....            | 28 10 0 | 0 0 0   |
| LEAD.....                        |           |           | Rapeseed, English pale..... | 30 0 0  | 0 0 0   |
| Pig, Spanish.....                | 13 3 0    | 0 0 0     | Cottonseed, refined.....    | 23 5 0  | 0 0 0   |
| English, common brands.....      | 13 10 0   | 0 0 0     | Tallow and Oleine.....      | 19 0 0  | 45 0 0  |
| Sheet, English.....              | 14 10 0   | 0 0 0     | Lubricating, U.S. ....      | 5 0 0   | 6 0 0   |
| SPRINGS.....                     |           |           | reduced.....                | 7 0 0   | 12 0 0  |
| Silesian, special.....           | 18 0 0    | 18 5 0    | TORPENTINE.                 |         |         |
| Ordinary brands.....             | 17 15 0   | 18 0 0    | American, in casks.....     | 1 11 6  | 0 0 0   |
| TIN.....                         |           |           | Tas—Stockholm.....          | 1 1 6   | 1 9 0   |
| Banco.....                       | 103 0 0   | 0 0 0     | Archangel.....              | 0 12 0  | 0 12 6  |
| Millon.....                      | 102 0 0   | 0 0 0     |                             |         |         |
| Strait.....                      | 101 0 0   | 0 0 0     |                             |         |         |

## CONTRACTS AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                        | By whom required.                         | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|------------------------------------------------------|-------------------------------------------|-----------------------------------|--------------------------|-------|
| Pulling down and Removing Old Buildings .....        | Poplar Board of Works                     | Official.....                     | Dec. 4th                 | xiii. |
| Waterworks.....                                      | Sutton in Ashfield L.B.                   | G. Hodson.....                    | do                       | ii.   |
| Repairing of Roads .....                             | M.R. End Vestry .....                     | J. M. Knight.....                 | Dec. 5th                 | xiii. |
| Water Mains, Hydrants, Sluices, &c.....              | Mansfield U.R.S.A.                        | G. Hodson.....                    | do                       | ii.   |
| Arcade, with Shops, Cellars, &c.....                 | Putney and Ardele Building Co., Ltd.      | Taylor & Evans.....               | do                       | xvii. |
| Stabling and Flooring, Bradford, &c.....             | Midland Railway Co.                       | Official.....                     | Dec. 7th                 | xi.   |
| Annual Stores.....                                   | G. N. R. Co.                              | do.                               | Dec. 8th                 | ii.   |
| New Schools and Teachers' House on old site .....    | Harrow-on-the-Hill, &c. School Board      | do.                               | Dec. 11th                | xi.   |
| Kerbing, Tarpaving, &c.....                          | Lewisham Bd. of Works                     | do.                               | do                       | xiii. |
| Pumpkin Engine and Boiler .....                      | West Ham Corporation                      | Lewis Angell.....                 | do                       | ii.   |
| Covered Way and Married Couples' Quarters .....      | St. George's Union.....                   | H. Saxon Snell.....               | Dec. 12th                | ii.   |
| Brick Sewer, Lee Bridge, Kent .....                  | Met. Board of Works                       | Official.....                     | Dec. 14th                | ii.   |
| Works and Materials .....                            | St. George Hanover-square, Vestry .....   | G. Livingstone.....               | Dec. 15th                | xi.   |
| Mortuary, Stabling, Cottage, &c.....                 | Harrow Local Board                        | C. F. Hayward.....                | Dec. 15th                | ii.   |
| Pooton and Approach Bridge, Waiting rooms .....      | Gt. Western Railway Co.                   | Official.....                     | do                       | ii.   |
| Passenger Station and Goods' Shed.....               | do.                                       | do.                               | do                       | ii.   |
| Pumps, &c.....                                       | Parham Local Board                        | do.                               | Dec. 21st                | xiii. |
| New Cofe School, for Leatherellers' Co.....          | Mr. E. Lyne Parsons                       | E. Lyne Parsons.....              | Dec. 21st                | xiii. |
| Two Blocks of Indebted Buildings, &c.....            | Brighton Guardians .....                  | B. H. Nunn.....                   | Dec. 31st                | xi.   |
| New Bridge and Removal of Existing Bridge .....      | Glasgow, Hillhead, &c., Joint Bridge Com. | Miller & Bell.....                | do                       | xiii. |
| Construction of Railway, &c., British Honduras ..... | Crown Agents for the Colonies .....       | Official.....                     | April 3rd                | xiii. |
| Wesleyan Chapel, Charlton .....                      | H. H. Church.....                         | Not stated.                       | do                       | xiii. |
| New Cofe School, for Leatherellers' Co.....          | Clark & Moscrop.....                      | Clark & Moscrop.....              | do                       | xiii. |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.               | By whom Advertised.   | Salary.             | Applications to be in. | Page. |
|--------------------------------------|-----------------------|---------------------|------------------------|-------|
| Building Inspector .....             | Willesden Local Board | 150 <i>l.</i> ..... | Dec. 11th              | xvi.  |
| Assistant Surveyors, R.E. Dept. .... | Civil Service Com.    | Not stated          | Jan. 4th               | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

|                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                          |                                                                                                                                                                                            |                                                                                                                   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| CAMBERWELL.—For building a detached house and stable at Forest Hill road, S.E., for Dr. A. Wheeler. Mr. C. W. Lovett, architect.—<br>J. Bate (accepted).....£1,150 0 0 | CLAIPTON.—For the supply of 1,000 yards of broken Guernsey granite, for the Claipton Local Board:—<br>a. d.<br>Mowlem & Co.....13 10 per yard.<br>Falls.....13 9<br>Turner & Son.....13 8<br>Fennings.....13 3<br>Nowell & Robson.....13 3<br>Manuelle.....12 11<br>Griffiths (accepted).....12 1 | CLAIPTON-ON-SEA.—For the erection of six villas, residences in Carnarvon road and Marine-parade, for Mr. A. B. Chamberlayne. Mr. E. C. Homer, architect, 89, Grosvenor-street, E.C.—<br>Messrs. Ellis & Turner (accepted).....£3,150 0 0 | CLAIPTON-ON-SEA.—For erecting six pairs of semi-detached villa residences, at Claipton-on-Sea. Mr. C. W. Lovett, architect, 14, Cockspur-street, London, W.—<br>J. C. Allen.....£8,000 0 0 | CLAPHAM.—For warming the Clapham Public Library. Mr. E. B. Hanson, architect:—<br>Thames Bank Iron Works Company.....£200 0 0<br>Robert Crane.....218 0 0<br>Orlinal.....150 0 8 | CLAIPTON.—For erecting stables and buildings for tramway, Lea Bridge-road, E. for Mr. J. Griffiths. Mr. C. W. Lovett, architect, 14, Cockspur-street, W.—<br>Boyer.....£4,397 0 0<br>Coley & Co.....3,900 0 0<br>Jackson.....3,855 0 0<br>Chessum.....3,650 0 0<br>Parker (accepted).....3,610 0 0 | CLEWER.—For erecting villa residence at Clewer, near Windsor, for Mr. D. Wilson. Mr. F. W. Rhodes, architect, 3, Clifford's-lane, W.C.—<br>Winer & Co., Buckingham Palace-road, S.W. (accepted).....£900 0 0 | CROYDON.—For the erection of a detached villa residence, Spenser-road, Blunt Farm. Mr. D. R. Dale, architect:—<br>Mutton (accepted).....£1,000 0 0<br>[No competition.] | CROYDON.—For additions to the Liberal Club-house, Park-street, Croydon. Mr. Daniel R. Dale, architect:—<br>Messrs. North & Co. (accepted).....£180 0 0<br>[No competition.] | CROYDON.—For the erection of one detached villa residence, Camden-road, Blunt Farm. Mr. Daniel R. Dale, architect:—<br>Dewdney (accepted).....£1,100 0 0<br>[No competition.] | FRIERN BARRET.—For making-up free roads, for the Friern Barret Local Board. Mr. Geo. Clarke, surveyor:—<br>W. H. Budden.....£4,290 0 0<br>B. Cooke & Co.....4,053 0 0<br>C. Killinback.....3,753 0 0<br>Wm. Neave & Son.....3,469 0 0<br>J. Jackson.....3,432 0 0<br>Thomas Hall.....3,424 0 0<br>Geo. Bell.....3,358 0 0<br>Mowlem & Co.....3,268 0 0<br>Rd. Mayo.....3,250 0 0<br>J. Bloomfield.....3,213 0 0<br>Nowell & Robson.....3,119 0 0<br>Thomas Adams (accepted).....2,935 0 0 | Tar Paving only.<br>Marchu & Co.....755 0 0<br>J. Smart.....491 0 0<br>J. Farthing (accepted).....492 0 0<br>[Five other contractors tendered for a portion of the works only.] | HAMPTON WICK.—For the erection of cow-house and dairy for Mr. Boret, Park-road, Hampton Wick. Plans and quantities by Mr. Elsom, architect and surveyor, Hampton Wick:—<br>Lansdown, Richmond.....£240 0 0<br>Lane, Kingston.....314 0 0<br>Oldridge, Norbiton.....295 0 0<br>Constable & Son, Hampton Wick.....290 0 0 | LONDON.—For building seven dwellings at Blythe-street, Bethnal-green, for F. Garner. Mr. Needham, architect. Quantities supplied:—<br>J. Andry.....£1,268 0 0<br>Benle.....4,137 0 0<br>J. A. Taylor.....4,133 0 0<br>J. Bloomfield.....3,178 0 0<br>Winkley (accepted).....2,790 0 0<br>Sharpe.....2,460 0 0 | LONDON.—For erection of shop in Queen's Elm-parade, Fulham-road, Brompton. Mr. Daniel R. Dale, architect:—<br>Hoare (accepted).....£230 0 0<br>[No competition.] | KIRKBY-IN-ASHFIELD (Notte).—For works of water-supply, for the Parish of Kirkby-in-Ashfield, Nottinghamshire, for the Eastern Rural Sanitary Authority. Mr. George Hodson, engineer, Loughborough:—<br>Contract No. 1 (General).<br>D. Barry, Radcliffe-on-Trent.....£3,859 0 0<br>Evans & Woodcock, Nottingham.....3,675 0 0<br>A. Raynor, Nottingham.....2,958 4 11<br>T. Smart, Nottingham.....2,913 0 0<br>J. F. Price, Nottingham.....2,922 0 0<br>H. Vickers, Nottingham.....2,545 0 0<br>E. Foster, Radcliffe-on-Trent.....2,500 0 0<br>J. Dickson, St. Alban's.....2,463 0 0<br>Holme & King, Liverpool.....2,450 0 0<br>J. Tomlinson, Derby.....2,399 0 0<br>Josiah Dale, Northwich.....2,343 4 10<br>Chas. Green, Rotherham.....2,209 10 0<br>Contract No. 2 (Pipes).<br>J. S. Roberts, West Broomwich.....2,380 13 5<br>Cochrane & Co.....5,900 0 0<br>Sylvester & Co., Newark, Staffs.....2,232 10 0<br>H. Hopkinson, Nottingham.....2,135 1 2<br>Staveley Iron Co., Chesterfield.....2,112 1 7<br>Oakes & Co., Alfreton.....2,435 4 8<br>Stanton Iron Co., Alfreton.....2,093 12 6<br>Butterley Iron Co., Alfreton.....1,987 18 0 | LONDON.—For alterations to Nos. 98 to 108, Cannon-street, for the India Rubber, Gutta Percha, and Telegraph Works Company, Limited. Mr. Henry Dawson, architect, 46, Finsbury-pavement, E.C.—<br>F. Atman & Fotheringham.....£8,683 0 0<br>J. Woodward.....5,900 0 0<br>C. Kynoch & Co., Newark, Staffs.....5,794 0 0<br>Colls & Son.....5,285 0 0 | LONDON.—For the erection of the Chelsea Public Library, Harrow-road, Kenal-tow, W., for the Chelsea Public Library Commissioners:—<br>Bat.....£4,315 0 0<br>Mundy.....3,400 0 0<br>Ferry & Co.....5,548 0 0<br>Shillito & Sons.....3,312 0 0<br>Staines & Son.....3,225 0 0<br>Peto Bros.....3,219 0 0<br>Nightingale.....2,180 0 0<br>Ward, Clarke, & Co.....3,169 0 0<br>Churchen.....3,151 0 0<br>Piven.....3,127 10 0<br>Bartley.....3,030 0 0<br>Dabbs.....3,050 0 0<br>Brass & Sons.....3,040 0 0<br>Liquore.....3,030 0 0<br>Stimpson & Co.....2,930 0 0<br>Simmons.....2,959 0 0<br>Wall.....2,983 0 0<br>Freddy & Co.....2,853 0 0<br>Whitehead & Co.....2,833 0 0<br>Allen & Sons.....2,945 0 0<br>Kynoch & Co.....2,923 0 0<br>Derry.....2,808 0 0<br>Brickell.....2,845 0 0<br>F. & H. F. Higgs.....2,800 0 0<br>Oldrey & Co.....2,791 0 0<br>Kellaway, 87, White Lion-street, Pentonville (accepted).....2,573 15 0 | LONDON.—For additions to St. Charles's College, Baywater, for his Eminence the Cardinal Manning. Mr. F. W. Tucker, architect:—<br>Colley.....£2,615 0 0<br>Wall.....2,413 0 0<br>Adamson.....2,378 0 0<br>Higgs & Hill.....2,340 0 0<br>Longley.....2,245 0 0<br>J. & J. Greenwood.....2,222 0 0<br>F. Atman & Fotheringham.....2,217 0 0 | LONDON.—For alterations, repairs, and fitting up new bar and shop-front, &c., at the "Green and Silver" public-house, Royal Mint-street, Minories, E., for the Cannon Brewery Co., Clerkenwell. Mr. J. C. Reynolds, architect, 30, Chamberwell-green, S.E.—<br>Jackson & Todd, Beckeney-road.....£1,389 0 0<br>Drew & Cadman, Holborn.....1,227 0 0<br>J. Walker, Limehouse.....1,167 0 0<br>Cocks, J. & Hy., Mile End.....1,148 0 0 | LONDON.—For a bakery and dwelling-house, at the corner of Cromer-street and Gray's-in-road, for Mr. G. Heiber. Messrs. Tolley & Gray, architects, 66, Cannon-street:—<br>Kingsman.....£1,657 18 0<br>Drew & Cadman.....1,630 0 0<br>Wall.....1,562 0 0<br>Waddington.....1,485 0 0<br>Marriage.....1,440 0 0<br>Sayer (accepted).....1,365 0 0 | LONDON.—For pulling down and rebuilding two dwellings and stables, for Mrs. H. Skinner, Mansfield-street, Kingsland. Messrs. G. & R. Low, architects:—<br>Kevan.....£3,595 0 0<br>Bolton.....3,577 0 0<br>J. A. Taylor.....3,499 0 0<br>Ivory.....3,464 0 0<br>Thompson & Son.....3,455 0 0<br>Holliday & Greenwood.....3,377 0 0<br>Jarvis & Sons.....3,250 0 0<br>Hale & Twicken.....3,147 0 0 | LONDON.—For rebuilding No. 81, Leadenhall-street, and for additions and alterations to Nos. 81, 82, and 83, Leadenhall-street, for Mr. John Pound. Mr. Frank W. M. King, of Billiter Square-buildings, E.C., architect. Quantities supplied by Mr. W. Dunk, 36 and 37, Leadenhall-street:—<br>Total amount.....£11,970<br>Alterations.....£3,230<br>Bywaters Bros.....11,537<br>H. L. Holloway.....11,469<br>Holland & Hauser.....11,469<br>Rider & Son.....11,691<br>J. & J. Greenwood.....11,487<br>Lawrence & Sons.....11,450<br>Brass & Son.....11,473<br>Colls & Sons.....11,395<br>Asliby & Horner.....11,290<br>J. T. Clappell.....11,262<br>Perry & Co.....11,160 |
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LONDON.—For alterations, &c., at the "Volunteer" beer-house, Poplar. Mr. Wesley, architect.—  
Walker ..... £231 0 0  
Boney ..... 195 0 0  
J. A. Taylor ..... 187 0 0  
Fenwick ..... 186 0 0  
Bishop & Webb ..... 164 0 0

LONDON.—For repairs to six houses at Seymour-street, Easton-road. Mr. D. Tabberer, architect.—  
J. A. Taylor ..... £185 0 0  
Whitbread ..... 180 0 0  
Johnson ..... 169 17 6

LONDON.—For building Mission-hall in rear of No. 386, Mile End-road, E., for Messrs. L. Ososki & Co. Mr. Charles A. Legg, F.R.I.B.A., architect, 13, Grafton-street, E. Mr. W. Hawker, surveyor, 19, Gracechurch-street, E.C.1.—  
Kinlock ..... £185 0 0  
Barnett ..... 425 0 0  
Havkies ..... 419 0 0  
Harper ..... 420 0 0  
George Lusk (accepted) ..... 385 0 0

LONDON.—For renovations and sanitary improvements at 7, Peterboro'-village, Walham-green, S.W. Mr. F. W. Rhodes, architect, 3, Clifford's-inn, W.C.—  
Winsor & Co., Buckingham Palace-road, S.W. (accepted) ..... £147 0 0

LONDON.—For alterations at the "Plough Tavern" corner of Hatcham-road and Penarth-street, for Mr. A. C. Mills. Mr. James F. Wesley, architect, 275, Romford-Forest Gate.—  
W. Downs ..... £746 0 0  
Hearle & Son ..... 664 0 0  
J. Walker ..... 659 0 0  
W. & F. Croaker ..... 627 0 0  
E. Alexander ..... 598 0 0  
M. Redman ..... 593 0 0  
J. A. Taylor ..... 559 0 0

LONDON.—For fitting up 10 and 11, Warwick-lane, for Messrs. Hitchcock, Williams, & Co. Messrs. Searle & Hayes, architects.—  
Shaw ..... £693 15 0  
Barnett ..... 686 3 6  
J. & J. Greenwood ..... 666 0 0

LONDON.—For the erection of a mission-hall, also alterations and additions, decorative and sanitary work, to 38, Porchester-terrace, W. Mr. Walter Hokes, architect. No quantities.—  
Fozey ..... £2,390 0 0  
Wittle ..... 2,271 0 0  
Chinchen, Kensal-green (accepted) ..... 2,070 0 0

LONDON.—For repairs and decorations to 33, St. George's-square, for Mr. Walter Williams. Messrs. Rogers, Chapman, & Thomas, surveyors, 40, Belgrave-road, S.W.—  
Hales ..... £492 0 0  
H. Smith & Son ..... 370 0 0  
G. Smith & Son ..... 432 0 0  
Hook ..... 418 0 0  
W. H. Lorden & Son (accepted) ..... 375 0 0

LONDON.—For erecting lavatories, Craven-street, Strand, W.C. Mr. F. J. Chambers, architect, 11a, College-hill, Cannon-street, E.C.—  
W. H. Lorden & Son (accepted) ..... £469 0 0

LONDON.—For repairs and decorations at 42, Tregunter-road, South Kensington, for Lord Frederick Kerr. Messrs. Rogers, Chapman, & Thomas, surveyors, Wetherby-terrace, Earl's Court.—  
Knot ..... £258 0 0  
H. Smith & Son ..... 219 10 0  
W. H. Lorden & Son (accepted) ..... 219 0 0

LONDON.—For strengthening floor in Emigration-room, and constructing new floor at Dr. Barnardo's Home, Stepney. Mr. H. H. Hill, architect, Lombard-court, E.C.—  
Harris & Wardrop ..... £409 0 0  
H. L. Holloway ..... 328 0 0  
W. Sheppard ..... 305 10 0  
O. Crane ..... 296 0 0  
W. H. Lorden & Son (accepted) ..... 290 0 0

NEWBURY (Berks).—For new dining-room and sundry alterations and additions to mansion, Donnington Holt, Newbury, for Colonel Howard Vincent, M.P. Mr. T. Marcus Houghton, architect, 10, John-street, Adelphi, W.C.—  
A. H. Houghton, Donnington, Newbury ..... £299 0 0  
[No competition.]

MANCHESTER.—For alterations and additions to general offices, in Dale-street, for the Rochdale Canal Company. Mr. William Owen, architect, 134, Deansgate, Manchester.—  
Jas. Hamilton, Bowden ..... £370 0 0  
W. Southern & Sons, Salford ..... 328 0 0  
George Macfarlane, Manchester ..... 314 0 0  
Owen Williams, Manchester\* ..... 276 0 0  
\* Accepted.

MORDEN.—For completing four houses at Morden-park. Messrs. Rogers, Chapman, & Thomas, surveyors, 78, Gloucester-road, South Kensington.—  
W. H. Lorden & Son (accepted) ..... £215 0 0  
[No competition.]

SURBITON.—For heating (by hot-water low-pressure system) the New Assembly Rooms, Surbiton.—  
J. Jones & Sons, 42, Farringdon street, E.C. (accepted) ..... £134 0 0

UPPER TOOTING.—For alterations and additions to "Falconhurst," st. Nicholas-road, for Dr. Mordaunt Mathew.—  
W. H. Lorden & Son ..... £403 0 0  
[No competition.]

URMSTON (near Manchester).—For the erection of three shops and dwelling-houses, for Mr. Jas. Fish. Mr. Wm. Owen, architect, 134, Deansgate, Manchester.—  
Jas. Hamilton, Altrincham ..... £1,390 0 0  
Adam Fox, Bowden ..... 1,303 0 0  
Butters & Carson, Manchester ..... 1,269 0 0  
J. Spink, Urmston ..... 1,265 10 6  
Wm. Moore, Eccles ..... 1,250 0 0  
George Macfarlane, Manchester ..... 1,245 0 0  
Owen Williams, Manchester\* ..... 1,219 0 0  
\* Accepted.

For slaughter-houses and stables in connexion with the above.—  
Jas. Hamilton, Altrincham ..... £110 0 0  
Adam Fox, Bowden ..... 109 0 0  
Owen Williams, Manchester (accepted) ..... 1-4 0 0  
Butters & Carson, Manchester ..... 99 0 0  
Geo. Geo. Macfarlane, Manchester ..... 92 0 0  
J. Spink, Urmston ..... 82 10 0  
Wm. Moore, Eccles ..... 82 10 0

WESTMINSTER.—For building Soldiers' Home and Institute, Caxton-street, for Miss Daniel, Mr. R. H. Hill, architect, 3, Lombard-court, E.C. Quantities supplied.—  
Higgs & Hill ..... £5,244 0 0  
E. Lawrence & Sons ..... 6,960 0 0  
J. Morter ..... 4,994 0 0  
B. E. Nightingale ..... 4,994 0 0  
J. T. Chappell ..... 4,988 0 0  
H. L. Holloway ..... 4,700 0 0  
Holloway Bros. ..... 4,676 0 0  
W. H. Lorden & Son (accepted) ..... 4,619 0 0

Bank, Clapham Junction.—The list of tenders for the London and South-Western Bank, as given in our last, was inaccurate in some respects. The following is the correct list.

Bryant ..... £8,731 0 0  
Bowyer ..... 6,942 0 0  
Gould & Brand ..... 6,427 0 0  
Shepherd ..... 6,200 0 0  
W. Johnson ..... 6,100 0 0  
Chappell ..... 5,700 0 0  
Jas. Smith & Sons ..... 5,987 0 0  
Kynoch & Co. ..... 5,875 0 0

#### TO CORRESPONDENTS.

Received.—W. H. C.—P. D.—A. S. T.—W. M. C.—F. J. L.—E. L. B.—A. E. W.—B. H. H.—J. S. R.—W. H. C.—G. C. F. M.—We hardly think the announcement a suitable one to make through the columns of a paper. Many people would reply, "We prefer to choose our own accepted leader." J. O. & G. see other letter. "The official list of wards." T. B. (previously sent).—"Chilton Follet Church" (no sender's name). F. H. & Co. do not receive the official list of wards.—"Constant Reader" (should send his name and address).—"I work week!"

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. We are compelled to decline to make out books and giving addresses. We cannot undertake to return rejected communications. Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED. All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

SUBSCRIBERS IN LONDON and the SUBURBS, by prepaying at the Publishing Office, 19s. per annum (for 4s. 6d. per quarter), can ensure receiving "The Builder" by Friday Morning's post.

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"THE BUILDER" is supplied weekly from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum. Foreign, To all parts of Europe, America, Australia, and New Zealand, 25s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS POTTER, Printer, Publisher, No. 46, Catherine-street, W.G.

#### BEST BATH STONE.

CORSHAM DOWN. | FARLEIGH DOWN.  
BOX GROUND. | COMBE DOWN.  
WESTWOOD GROUND. | STOKE GROUND.  
**THE BATH STONE FIRMS, Limited.**  
HEAD OFFICES: BATH.

#### DOULTING FREESTONE.

The stone from these quarries is known as the "Weather Bed" and is of a very crystalline nature, and undoubtedly one of the most durable stones in England. Is of the same crystalline nature as the Chelchynch Stone, but finer in texture, and more suitable for fine moulded work. Prices, and every information given, on application to CHARLES TRASK & SONS, Doulting, Shepton Mallet.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.]

#### HAM HILL STONE.

Greater facilities have been provided for working these quarries, and the stone can be supplied in large quantities at short notice. Prices, and every information given, on application to the HAM HILL STONE CO., Norton, Stoke-under-Ham, Somerset.

London Agent—Mr. E. A. WILLIAMS, 16, Craven-street, Strand, W.C. [ADVT.]

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### The National Art Congress at Liverpool.



HE "National Association for the Advancement of Art and its Application to Industry" (there is a point, as the reader will see, in giving the full title) has certainly put forth an

imposing programme for its first meeting, which is being held during this week at Liverpool. A glance at the list of papers, which is printed in full last week (see pp. 339, 400, &c.), will show what an all-round review of the conditions and aims of art in its various forms is being attempted, by a whole phalanx of artists and critics, many of them men of the first standing in their art; and though it is no true that people cannot be talked into a perception of and feeling for artistic beauty, it seems impossible but that many valuable lessons should have been struck out during the week's discussions, and that many of the speakers should have been assisted to see things artistic in a new and a clearer light. This, indeed, as we shall find specially indicated in the President's opening address, was one of the main objects with which the Association was set on foot. In spite of the picture-purchasing propensities of the day, in spite of the undoubted improvement in taste in such things as household furniture and fittings in recent years (to which Sir F. Leighton hardly does justice), it is still true that the majority of English people labour under an apparently almost constitutional inability to distinguish between what is good or bad, refined or vulgar, in art; that, in fact, most of them do not really know or feel in what the artistic spirit in design really consists. That is the great stumbling-block in regard to the prospects of art in this country. Many Englishmen who are quite ready to admit that one ought to have art,—that art is a noble thing; that the culture and development of art should be encouraged,—really do not know what art means, and confound it with mere costliness, luxuriance, and finish of workmanship. Many, probably, have no innate capacity for ever knowing more than this; but in many others the power of artistic perception is dormant, and may be aroused and fostered by inducing them to regard art as a subject worth serious consideration, and

not a mere amusement or indulgence for wealthy persons, by teaching them to think where they have never thought before. It is, as we gather, with this object that the Association has started the idea of holding meetings in large provincial centres for the discussion of artistic subjects. The precedent is furnished, of course, by the British Association for the Advancement of Science, which has for so many years past held annual congresses in the principal towns of the realm, for the discussion of scientific subjects. It must be borne in mind, however, that the cases are not parallel; the conditions are not the same. As we observed from the first in regard to the Art Association (and we are glad to see that the *Times* urges the same point in its leading article of last Monday), science is essentially progressive, art is not; annual scientific meetings have each year new facts to bring forward, new discoveries to announce, and a new position to work from. Art, except in regard to its processes, does not depend on the collection and verification of scientific data; it is, in a sense, the same yesterday, to-day, and for ever, and cannot profess to progress with definite steps which can be announced year by year. And for this reason those who govern the working of the Association will be wise to restrict somewhat the number of their congresses, and not attempt to rival the Association for the Advancement of Science by holding annual meetings. Such a course would be apt to lead to "vain repetitions" of the same exhortations and criticisms in slightly varying language; and the very extent and variety of the Liverpool programme suggest the impossibility of repeating the same "function" in another town next year with the same effect. It is good to talk about art from time to time; but not too often, seeing that the essence of art is not in talking. Wherefore we recommend that the Art Congress should not be attempted as an annual event.

The main object of the Congress being, as observed, the guidance and formation of public taste, one idea which it has evidently been intended to emphasise, as indicated in the latter part of its title quoted above ("Art, and its Application to Industry"), is that Art is concerned as much with the little every-day things of life as with such productions as pictures and statues. It is, indeed, in the make and fashioning of every-day objects and utensils that the presence or absence of the artistic spirit in a people is perhaps most dis-

tinctly indicated. As the President observed in his opening address, we see nowadays, with a kind of rueful astonishment, collections of the utensils belonging to people of some past times, in which there is "nothing ugly;" a condition of things the possibility of which we can hardly realise now. We walk through the Greek vase rooms of the British Museum, and find ourselves among a collection of things, all of which, down to the smallest, are fashioned with an eye to a kind of stately yet delicate symmetry and grace. The people who can thus

"Give to barrows, trays, and pans,  
Grace and glimmer of romance"

(a charming sentiment of Emerson's, though an atrociously bad rhyme), are more certainly and evidently artistic in spirit than could be proved by the more occasional production of great paintings and statues. The latter might be the work of individual and exceptional genius, the former show that artistic feeling is in the hearts of the people at large. It is in connexion, no doubt, with this view of the objects of the Congress that the President alluded, in his opening address, to the fact that "the chief magistrate of an important centre of English industry, the Mayor of Preston, wears at this time a chain of office which is a beautiful work of art, and this chain was not only designed, but wrought throughout, by the sculptor who modelled the stately commemorative statue of the Queen that adorns the County Square at Winchester." Mr. Gilbert's beautiful bit of gold work, referred to here, we alluded to when it was exhibited in the Royal Academy sculpture-room this year. Perhaps it is owing to the fact that the artist of this, and of the metal figures on the Fawcett Memorial, is President of the Sculpture Section of the Congress, that we find "the precious metals" forming the subject of a paper read in that section by Professor Roberts-Austen.

The Congress could not have been better and more suitably prefaced than by the President's admirable address. Sir Frederick Leighton is certainly open to the charge of being sometimes over-flowery and unduly discursive in his addresses and speeches on art; but his address on Monday night was open to no such criticism: it was not too long; it was eloquent where it touched on subjects on which every lover of art must of necessity be eloquent; it gave a comprehensive and logical summary of the objects of the Congress; and it was interspersed with capital satirical hits in criticism. The special deficiency of the English mind in regard to



art Sir Frederick defined as the want of consciousness that anything claiming to be a work of art, from a great palace to the smallest production, is such only "on condition"—of what? That is the difficult thing to define; for it is the attempt to express in words what cannot be expressed in words, or we should not need art at all. This, *bien entendu*, is our own reflection, not Sir Frederick's. He says, "On condition it contains the precious spark from the Promethean rod, the divine fire-germ of living beauty." One of his predecessors in the Royal Academy chair, Sir Joshua Reynolds, stood before a work of no genius, and said, "It wants it wants that!" and snapped his fingers as he spoke. These are only different ways of saying the same thing; either of them will do; the great point is to persuade people that something is wanted, beyond mere execution, to constitute any production a work of art; that it is their business to train their intellect and feeling to perceive the presence or absence of that "something," and that until they have achieved that, the world of art is closed to their perceptions. Among other points in the address we may mention the passing criticism on the Japanese and the curious phenomenon which they present, of a people with the most intuitive perception of artistic beauty in decorative work, without the slightest perception of beauty or dignity in the human form. Sir Frederick is severe, and justly so, on the treatment of the National Gallery architecturally; the competition for designs for a new building; the utter throwing over of the whole scheme; and the building of ugly and unmeaning excrescences on to the existing building, with utter disregard of architectural fitness or beauty; and adds "I have never heard one single word of articulate public reprobation levelled at this now irremediable blot on what we so complacently call the finest site in the world; and yet I cannot find it in my heart to believe that many have not, like myself, groaned in spirit before a spectacle so deplorable,—a spectacle which, indeed, is only conceivable within these islands." Sir Frederick might have found an even more monstrous example in the case of the defacement of one of our great cathedrals by the hanging architecture of Lord Grimthorpe, about which also there has never been a word of what could be called "public reprobation," and of which also it may be truly said that it is "a spectacle only conceivable within these islands." The utter deadness of the English perception as to sculpture Sir Frederick does not exaggerate, though we do not agree that to the majority sculpture only means the execution of Mr. Somebody's portrait in bronze, or marble, or terra-cotta. The British public will also take interest in mild devotional works of sculpture, "The Evening Prayer" and such other instructive figures, and in realistic sculpture of the "Oh! you dirty boy!" type. It is with sculpture as Sir Frederick himself says it is with painting; to most people "the attractiveness of a work is in proportion to the amount of literary element which it carries"; and the popular taste in this respect may be delightfully gauged by the character of the works which, in our exhibitions, are labelled in the catalogue "copyright reserved," which means that they are to be engraved, as works of special interest, for one of the popular illustrated journals. Nor is there a less significant indication of public taste to be found in the character of our ordinary gold and silversmiths' work, in "the nymphs and goddesses," as Sir Frederick sarcastically puts it, "the Satyrs and the Tritons, that disport themselves on the ceremonial gold-smithery of the United Kingdom."

Mr. Aitchison's address as President of the Architectural Section, which was delivered on Tuesday, dealt with the subject of "Utilitarian Ugliness in Towns," and insisted strongly on the public advantage of the study and appreciation of noble architecture, even to those who could not afford to build themselves, for their knowledge and appreciation would encourage a higher and deeper professional study, and would reward its

success. This feeling, that a higher appreciation of architecture by the public, and a greater interest in the subject on their part, is almost a necessary condition of any great and wide-spread improvement in the standard of our national architecture, has been often expressed in our columns. As long as the public and their representatives in the Legislature care nothing about architecture, economy will continue to be the first consideration in regard to all our national buildings. Mr. Aitchison urged that architecture should be a subject included in general polite education. The fairer half of mankind in this country were habitually taught music, but whoever thought of teaching them architecture,—the art which, in its nature and principles, offered the closest analogy with music?

The best point in Mr. Walter Crane's presidential address in the Section of Applied Art on Wednesday morning, which was listened to by a crowded and sympathetic audience, was his hit at the Royal Academy as an institution purely for exhibiting paintings, to the neglect of art in its larger sense. We speak without prejudice on this head, inasmuch as we have always opposed the exaggerated views of the critics and artists of the modern "Decorative Art" School, who almost condemn picture-painting as an inferior art, and speak as if art workmanship in decorative work were really the highest branch of art. It may be that this kind of exaggeration is necessary in order to get the public at large to realise at all the true importance and interest of artistic craftsmanship. But we have always maintained that a fine picture is an object of more intellectual interest than a fine gold bracelet or a fine wrought-iron grille; and we shall continue to think so. But when we come to consider how the spirit of working which is called "artistic" may be exhibited in every kind of thing that is made or produced by man, it does indeed seem absurd to think of the proportion of space given at the Royal Academy exhibitions to one popular form of art,—to the production of a great picture-show, with little comparative room for sculpture and almost none for decorative art, which has only been permitted a kind of stealthy representation in the shape of a few stray articles clandestinely admitted into the sculpture-room. This method of arranging and apportioning the work annually exhibited at the Academy is in reality, if "the Forty" would confess it, a mere response to vulgar popular taste. Popular taste demands pictures; and pictures, some good, many indifferent, are accordingly supplied; but in truth it is the duty of the Royal Academy to lead, not to follow, public taste. Some of "the Forty" know this well enough, and probably feel it keenly; it is to be hoped that in time they may influence their more dull and conservative brethren to move in the right direction. Mr. Crane suggested that there was a great opportunity for the Academy to give practical proof of its interest in decorative art, by giving its rooms for the next exhibition of the "Arts and Crafts Association"; but that is hardly to the point; what is needed is that the Academy should give to the Arts and Crafts their fitting relative place in its own annual exhibitions.

The paper on the difficult subject of "Style," read on Wednesday afternoon by Mr. Basil Champneys, turned mainly on the necessity for architects aiming at the establishment of a harmony of principle in their works, arising from close care and attention to detail, based on the study of the best and purest styles. In the course of his paper Mr. Champneys made a protest against the endeavour after "originality," as leading too often to the pitfall of mere eccentricity, and away from the highest characteristics of refinement and restraint; and also raised the question as to the reality of the theory which has been often heard of late, that Mediaeval architecture was essentially the work of a band of craftsmen rather than of the mind of a single designer:—

"We shall all, especially architects, who have learnt by sad experience, admit that the present order of things, in which the workman is no longer

the intelligent co-operator with the designer, but greatly altered the conditions of architectural enterprise. I am inclined to think that the condemnation of the modern workman as a mere intelligent machine is carried too far by many theorists; and that in the comparison of modern with ancient workmanship to the condemnation of the former, a considerable range is given to fancy. It is almost impossible to dissociate the imaginative charm which attaches to all ancient work from actual superiority in workmanship. But without further discussing this question, we may at least assume that the changed conditions of architectural work must affect the character of the style. In the whole process of building, from the design to the detail, is the work of one mind, the character must be different from that arrived at by a more or less co-operative process. What in the one is a natural charm will in the other become an affectation. If we attempt to reach by artificial means the sort of spontaneous variety which is characteristic of genuine Gothic we shall fail of our effect with those who know that Mr. So-and-So has had individually to discharge the functions of a guild of workmen. The moral of this, however, is not that the style is out of our reach, but that its expression character must be adapted to modern conditions. Nor, indeed, do I think that in yielding to these conditions—in letting our work seem, as it is, a matter altogether of deliberate design, we shall be leaving all precedent behind us. I fully admit that the charm of spontaneous variety is the note of much Gothic work, but do not admit that it is the main characteristic of all. I can recall many Gothic examples, from the study of which I carried away a predominant impression of design. I saw the entire work ordered in due and beautiful proportions, with no departure from the original scheme, with little if any trace of mental movement on the part of mason or carver. There is the architect's Gothic, as there is workman's Gothic, and to whichever may attach the greater charm, for the present at least one type only is open to us. And this condition of successful modern work in Gothic seems to me to have been appreciated by our best modern designers. Such a work as St. Augustine's Church, at Kilburn, relies mainly for its effect upon design in its larger sense, while in its purity and originality of form it evinces a masterly appreciation of the true spirit of Gothic architecture."

It was a curious chance coincidence that Mr. Jackson, in his paper which immediately followed, touching on the same point, introduced some absolute proofs, from old building contracts, as to the position of general director and designer of the whole work in all its details, often openly and distinctly occupied by the mediaeval "master-mason." A speaker, in the short discussion which followed on Mr. Champneys's paper, made the exceedingly practical suggestion that architects should make an endeavour to see to it personally, on all their works, that each workman should have a distinct idea of the whole building, and of the relation of his individual work to the total. This is a suggestion which is worth noting and emphasising. Mr. Jackson's paper on "Obstacles offered to the Progress of Architecture by Architects themselves" was a most admirable one, listened to, we regret to say, by a very small audience, "fit though few," and fitly representing, we fear, the proportion of the public who really take any interest in architecture. His main point was that a great deal of the bad architecture of the day was chargeable to the neglect of his duty by the architect; that the essence of fine architecture began where detailing began; that the hand of the artist was really shown in the way in which every detail of a building was carried out in a refined manner, and with due consideration given to it by the designer of the building. Mr. Jackson produced some dreadful evidence which had come to his knowledge, derived in many cases from contractors who had some perceptions as to architectural work (and, of course, without giving names), as to the utter indifference of the so-called architects of some large and important buildings in regard to their details, which were all either done by a "ghost" or by the contractor himself. Mr. Jackson thought we should look at home before abusing the public for their want of taste. On the other side, it may be said that it is because the public care nothing about good architecture, and are utterly indiscriminating in the matter, that there is so little inducement for the most cultivated and thoughtful class of men to put their best mind into architecture, and that for the same reason it is that in so many cases an architect is selected



for reasons of more interest,—because he is Surveyor to the Company who are about to erect a new building, or something of that sort,—and not because he is an artist. This side of the case must not be forgotten; but Mr. Jackson's side is perfectly true, and his paper was an admirable one, both in substance and literary style.

Mr. Brett's paper on "The Relation of the Pictorial to the Decorative Arts" was, as every one would expect from him, incisive and brilliant; we shall probably return to it more at leisure; meantime we cannot resist extracting the following little shaft, directed against unconstructive and thoughtless so-called "decoration" :—

"In Greek architecture the design was so perfect that ornament was rarely admitted. Only the highest achievements of sculpture could by any means add to its dignity, and that was a primary element of the architectural conception. Where the structure is faulty, as it usually is in modern times, I will admit that it is a legitimate function of decoration to conceal the weakness of the design. The modern Englishman, however, believes profoundly in decoration as an independent source of pleasure; and if any of the London shopkeepers, who are busy passing over the inside of our dwellings with their tedious patterns and flourishes and their pink and green cornices, were allowed to get at the Parthenon, they would treat it in the same way, and they would logically proceed to 'tattoo' the sculpture.

I am grieved to say that some person has been allowed in this way to desecrate one of the most beautiful Norman churches in England, that of St. Cross, near Winchester. This is really worth seeing, as it marks, to my mind, the utmost depth of iniquity to which a decorator may descend."

These are bitter words indeed! We regret that it is impossible to dismiss (for the present) the subject of the Art Congress without a strong and very decisive protest against the utterly unbusiness-like manner in which the arrangements for reading papers were carried out. These were altered every day from the announced programme, sometimes at a moment's notice, in a manner which became absolutely exasperating, and gave rise to very strong comments on the part of people who could not discover when or where they were to lecture or to hear lectures. On Wednesday morning a large meeting for discussing the question of Sunday opening of museums,—a matter which has nothing to do with art, and ought never to have been forced on the Congress at all,—was made the excuse for suddenly stopping all the sectional meetings, sending away lecturers and listeners to speculate as to when they were to meet again. We do not know precisely whose fault this is, but it is clear that some one in connexion with the management has no head for business and no consciousness of the necessity of systematic arrangement; and this must not be allowed at another Congress.

#### NOTES.

**T**HE Rhymney "Preference rate" case, to which we drew attention in our issue of the 10th ult., was again before the Railway Commission last week. It will be remembered that the Commissioners decided against the railway company, and,—as is usual under such circumstances,—they have been endeavouring to carry the case into a higher court. The Commissioners were asked to state a case upon certain questions of law, but the chief Commissioner, in the course of a lengthy and exhaustive judgment, again decided against them. Sir Frederick Peel declines to treat as points of law matters which are really only questions of fact, and he showed in a very clear and lucid manner that some of the points now raised came within the latter category. It was again explained that the Commissioners distinguish carefully between justifiable preference and undue preference; and further, that their construction of the Act being supported by previous judicial decisions, there was really no point of law upon which to base an appeal. It is satisfactory to know that the Rhymney Iron Company will not have to bear the expense of another trial, and that the Commissioners have confirmed their original decision in such

a decisive and unhesitating manner. It is a matter for congratulation that Sir Frederick Peel is to be retained as one of the permanent Commission appointed under the new Railway and Canal Traffic Act, as his experience and insight will be of very great service. It has been announced in the House of Commons that this has been definitely settled, the other lay Commissioner being Mr. Price; while Mr. Justice Wills (who for many years acted as counsel for the Midland Railway Company) has been appointed President in England, Lord Trayner in Scotland, and Mr. Justice Murphy in Ireland.

**T**HE meeting held on Wednesday afternoon at King's College, to take into consideration the present condition of the Church of St. Mary-le-Strand, was not by any means unanimous, but the resolutions submitted were agreed to by substantial majorities. Professor Hayter Lewis wrote:—"I most cordially wish success to the efforts to preserve so beautiful a building. A stranger, ignorant of our wonderful ways in London, must be surprised that there should be any doubt or difficulty about its preservation." A letter was also read from Mr. Wyatt Papworth, cordially supporting the movement for the preservation of the church; and Mr. F. C. Penrose, Mr. Ewan Christian, the Rev. Precentor Venables, and other gentlemen well known as architects and antiquaries, were present. Mr. J. Macvicar Anderson, the architect who has been consulted by the rector, presented the following report :—

"In accordance with instructions received from the Rector, I have made a careful inspection of the stonework of the Church of St. Mary-le-Strand."

The cause of the serious fractures that have occurred in the stonework is, in my opinion, the iron chain bond which has been built into the walls, and the iron cramps which have been used in fixing the masonry. The iron has oxidised, in some instances to such an extent as to be now nearly double its original section, with the inevitable result of having split and fractured the stonework surrounding it.

So far as I can ascertain, there are two tiers of iron bond on the inside of the church, and two tiers on the outside, in both cases within some 4 in. or so of the face of the walls, and upon the same levels.

In order to restore the stonework to a state of safety, I consider that it is essential to cut out of the walls, externally and internally, the whole of this iron bond, and to remove whatever iron cramps may have been used in fixing the stonework; making the walls good thereafter with stone to match the present.

The balustrade on the building, outside, is in a very dilapidated and ruinous state, and I consider that the only satisfactory course is to remove it entirely, and replace it with new work of precisely the same design.

The upper member of the cornices externally is very much decayed. I recommend that it should be worked off and replaced with new stone to match the old; and in order to avoid such decay occurring in the future, the whole of the external cornices should be protected by a lead covering.

There are many defective and missing stones. These require to be renewed and the masonry generally requires to be carefully pointed.

The tower appears to be in fair condition, but the vases and terminals, which formed part of the original design, and have been removed, should certainly be restored.

The vases which surmounted the balustrade on the top of the church should also be replaced.

With respect to the cost, it is difficult to give an exact estimate, because it is impossible to ascertain positively, without cutting away the stonework, to what extent iron may be imbedded in the walls. I am, however, of opinion that the conjecture I have arrived at in respect to the position and extent of the iron bond and cramps cannot be far wrong; and assuming that to be the case, I am further of opinion that the cost of carrying out in a thoroughly sound manner the works I have described, including the reconstruction of the interior of the church, so far as that may be rendered necessary, would be about 3,000*l.* (three thousand pounds)."

The chairman of the meeting, the Bishop of London, having spoken very warmly in favour of the preservation of the church, Mr. Ewan Christian moved a resolution affirming the desirability of repairing and reinstating the church. This was seconded by Mr. F. G. Hilton Price, but it was not carried without considerable discussion, the principal spokesman of the opposition being Mr. Cole, a tradesman in the Strand, who affirmed that the church was an obstruction to the traffic,

that the congregation was very small, and that Mr. Macvicar Anderson's report as to the cost of the work was greatly at variance with the report of the architect (Mr. Albert Vicars) who was some time ago consulted by the churchwardens, and whose estimate for repairing the church was stated to be 8,000*l.* Subsequent speakers pointed out that there was no real ground for the assertion that the church was an obstruction to the traffic, and that if there were, a wider road should be made on the north side of the church, as suggested in the *Builder*. The rector, the Rev. Lewen Tugwell, denied that the congregation was so very small as had been suggested. As to the question of cost, little further was said. Eventually, the motion was carried by a large majority, as were resolutions appointing a committee, and pledging the aid of the meeting. Promises of subscriptions amounting to about 500*l.* were announced in the room.

**R**EPRODUCTIONS of working drawings, &c., on a large scale by the blue print process are somewhat costly and difficult to make, owing to the size of the glass frame and other considerations. Professor Cleaves has introduced a process by which prints of any size can be made without a glass-frame. A cylinder is used of a length exceeding that of the drawing, and of a diameter such that the tracing can be conveniently wrapped round it, with sufficient space to give room for the clamps by which it is held. This cylinder is covered with felt, and the sensitive paper is carefully wrapped round it, the tracing to be copied being drawn over the whole and held smoothly in place by spring clamps. It is easy to lay the tracing smoothly over the surface and draw it into contact so perfectly that the work done is even better than that produced by the glass-frame and air-cushion commonly used. When the apparatus is ready it is mounted on a cradle and revolved in the sun by a cord driven by any convenient shafting, or by hand. A little more time is naturally required than that necessary for the flat process.

**M**R. BURNETT'S Report on the nail and small chain making industries of the Black Country has just been published. It is a dismal recital. The manufacture of machine-made nails, the influx of female labour, and the relative increase of the class of middlemen, or "foggers"—the equivalent of "sweaters,"—has reduced these trades to the wages of semi-starvation. It is estimated that about 15,000 people are engaged in the nail-making, one-half of whom are females, all situated within a circle of about ten miles, whose centre is at Dudley. It is essentially a household industry, grandiose, parents, and children, male and female, working therein. The shops are dingy sheds in the rear of the dwelling-houses, small, dark, and dreadfully insanitary, privies and ash-pits being full to overflowing. The labour is of a most exhausting character, men and women work in a semi-nude condition, and the perspiration streams from their faces. Decency is impossible. The married women bring their babies to the shops, and sling them in boxes from the roof-beams, or seat them on the bellows, or among the breeze beside the forge. Notwithstanding domestic claims, they will spend ten or twelve hours in work daily, even when far advanced in pregnancy, at the forge. The single women work longer still, and the men frequently toil from six in the morning till ten at night. The wages of married women will range from 2s. 6d. to 3s. per week, of single women from 4s. 6d. to 5s. 6d., and those of men from 9s. to 10s. This represents *net* earnings, for, although the employers' books will show larger sums, there are the deductions for rent, breeze (small coal), and other incidentals to be taken into account. Those who work for the "foggers" will clear less than those who take their nails to the regular warehouses. The "fogger" takes advantage of the necessities of the half-starved people in times of dull trade, and buys their nails below list prices. It is stated, although it is confessedly difficult



of proof, that the Truck Act is evaded, the "foggers" and "foggers" wives keeping provision shops, where the people are expected to deal. There is practically little Factory inspection, neither is such desired, lest the miserable gains obtained by working prohibited hours should be diminished. The small chain trade is about as bad as the nail trade, and the remarks applicable to one are generally applicable to the other. The two trades have much in common, and are carried on in the same districts, sometimes in the same shops. Mr. Burnett believes that pure individualism has largely contributed to reduce the workers to their present wretched condition, "each fighting for his own hand, and either underselling, or being undersold by, his neighbour and fellow-toiler in the struggle for his daily work." Numerous suggestions for the amelioration of the condition of the workers close the report, most of which are of a merely palliative character. We trust that the Committee of the House of Lords now sitting on the Sweating System will take evidence from these districts. The state of the workers is so wretched that self-help is almost impossible. The only hope is, that if the light of publicity can be brought to bear upon the degradation of men and women in the Black Country, it may lead ultimately to a better state of things. Mr. Matthews stated in the House of Commons on Monday night that such is the intention.

THE annual Christmas Exhibition of the Donegal Art Needlework was held on Saturday last at Donegal House, 43, Wigmore-street. It was an exceedingly interesting exhibition, for not only were there many really artistic specimens of needlework on view, but Mrs. Ernest Hart seemed anxious to explain her methods of teaching and training the workers, from the weaving and dyeing of the wool or flax, to the finished and elaborate embroideries. Mrs. Hart has started technical classes in some of the poorest and most congested districts of Donegal, where the Irish girls are taught hand-loom weaving, drafting, designing, textile calculations, pattern-making, embroidery, lace-making, and vegetable dyeing. This latter is an important item, and Mrs. Hart has gone thoroughly into the matter, and has made experiments in her own laboratory, on the different colours that are to be obtained from the native flowers. The wild heather (growing in such profusion on the bogs) is one of the richest in colouring matter, and yields many varieties of tone. We noticed many beautiful specimens of linens for decorative purposes; one kind, which had a softness and lustre equal to satin, had been ordered (so Mrs. Hart informed us) for curtains and draperies for the English department of the Paris Exhibition of 1889. Among some of the finest embroideries we noticed a beautiful coverlet embroidered in old-gold silk on white poplin, from a fifteenth century pattern; a panel for the front of a lady's dress, with bodice trimmings to match, in which the ground as well as the design was worked, the stitches radiating from different centres so as to give different lights. There were some pretty designs in "spring-time curtains," each curtain having a different pattern on it. We noticed some new ideas for cushions, screens, and such small things which must necessarily be in a house, and on which were embroidered mottoes and lines of poetry, with appropriate designs (by-the-by, some of the designs were not very appropriate: a landscape in wools, however much conventionalised, is hardly art). These things are all so thoroughly well done that they will last, and may perhaps make our poets more familiar to the children and the unreading public than the bound books lying on the shelves. Though the attempt to make a special market for Irish products of this kind may be a doubtful policy, in a political economy sense, yet one cannot but recognise that Mrs. Hart is doing a great work, for not only is she teaching and training thousands of poor ignorant girls, and giving them some hope of raising themselves by their own dex-

terity, but she is placing before the public thoroughly good materials and work, and though it may not be exactly what the public wants, it is so excellent of its kind that we can only hope it may of its own worth create a demand.

AT their meeting on Thursday, November 29th, the Court of Common Council adopted two reports by their Markets Committee. These provide for an extension of Billingsgate Market, and the erection of a new market for fruit and vegetables, on an area of nearly 60,000 feet superficial, which has lain waste for several years past, at the corner of Farringdon-road and Charterhouse-street. Costing 15,500*l.* after the City Architect's drawings, it will supplant the present Farringdon Market, which seems never to have been a great success since it was opened in 1829, in the buildings designed by W. Montagu, over the site of Fleet Market. This last-named had been established here in 1737, upon the demolition of the Stocks Market, by Walbrook; the Fleet ditch, between Holborn and Fleet bridges, having been,—as, indeed, was high time—covered over. The Court further resolved to expend a sum of 700*l.* upon sundry sanitary improvements at the Mansion House; which, designed by the elder Dance, was begun in 1739 upon the old Stocks Market ground. Fishing-boats paid dues at Billingsgate in Æthelstane's day. In "1st Eliz." the wharf or quay was declared by statute to be an open place for the landing and bringing "in of any fish, corn, salt stores, victuals, and fruit (grocery wares excepted), and to be a place of carrying forth of the same, or the like, and for no other merchandises." That Act was, perhaps, aimed at a growing practice, which is illustrated by a previous record of 1560: "There came a sheppe of egges and shurtes and smockes out of France to Byllingegatte." In 1699 an Act was passed to limit the traffic to "all sorts of fish." The premises were rebuilt by J. B. Bunning, architect, in 1849-53, and have been since enlarged. The proposed additions will occupy a recently-cleared area in Lower Thames-street, at an estimated cost of 19,215*l.*, with rentals of 5,245*l.* in the aggregate, and an annual expense of 4,514*l.*

WE hear that Brooks's Club-house, in St. James's-street, is about to be enlarged by the addition thereto of the two adjoining houses in Park-place, at an estimated cost of 1,400*l.* The present premises were built in 1777-8 by Brooks, money-lender and wine-dealer, from the designs of Henry Holland, who was architect, also, of Boodle's. At one time the chief temple of wagers and deep play, this club originated with a *coterie* who used to meet in Almack's gaming-house, when kept, we take it, at the old Thatched House Tavern,—now site, in part, of the Conservative Club, Smirke & Basevi, architects, 1843-5. But the existing club was established in 1764, by some leading Whig peers and commoners of that day, and, it appears, in a house on the sunny side of Pall Mall. That house was rebuilt for his once popular "Shakespeare Gallery" by Alderman Boydell, who paid Thomas Banks 500 guineas for the bas relief on the front—it remained to our own day—of Shakespeare with Painting and Poetry. A fine engraving of this group will be found in the collection of large-sized engravings that was made of the pictures. On the dispersal of Boydell's paintings in 1806, a committee bought the lease for the British Institution. That was closed in 1870, giving place to the Marlborough Club. Amongst the earlier members of Brooks's were Charles James Fox, who for a while lived next door; George Selwyn, Wilberforce, Wilkes, Sheridan, whom Selwyn black-balled more than once only because his father had been a player; Gibbon, Sir Joshua Reynolds, Burke, and Garrick.

SIR JAMES PICTON, the veteran Liverpool architect, has published, appropriately at this moment, a pamphlet\* on the history of

\* Walmisley; Liverpool.

the various Town Halls of Liverpool, first read as a paper before the Liverpool Architectural Society on the 26th of last month. Some portion of the information, in regard to the existing Town Hall and its inscription, we have already had in Sir James Picton's "Annals of Liverpool"; but the pamphlet gives, in a convenient form, a good deal of curious record as to the successive Town Halls of Liverpool.

THE *Art Journal* for December contains an article by Mr. M. W. Conway, on the Berlin Museum, illustrated by a couple of fine line engravings, one of which, by Jacoby, after Filippo Lippi, forms the frontispiece to the number. An article by Mr. Henry Wallis, on "the Glass and Ceramic Gallery at the British Museum," is of great interest both for the information it gives and the admirable cuts with which it is illustrated. "A Foreign Artist and Author in England" visits Rams-gate and Margate in this number, and his sketches are admirably characteristic.

THE *Scottish Art Review*, which continues to show itself one of the most able and intellectual of the recent art periodicals of the day, contains this month a notice of the life and works of the late Mr. Sellars, the architect, with a portrait and some small illustrations of some of his designs. An article on the exhibition of decorative handicraft at the Royal Scottish Academy, with some illustrations, is of interest; and among the contributions, is a short notice by Mr. Leland as to a supposed discovery of the existence of jade in the island of Iona. "A Ballade of Kelvin Fair," with some sketches, commemorates humorously the Glasgow Exhibition—

"The gaudy bubble that we blew."

A small landscape, an evening scene by Mr. O'Meara, makes a charming illustration; landscapes of the "impressionist" school have the merit of reproducing well.

WE have received Dr. Page's report to the Local Government Board on the circumstances attending an outbreak of small-pox in St. Joseph's Certified Industrial School, Manchester. The causes of the outbreak seem, however, to have been unconnected with any deficient sanitary arrangement of the building.

A ZINC-CREOSOTE process of preserving timber is described in the recent volume of "Proceedings of the Institution of Civil Engineers." The experiments from which the data have been obtained are from the observations of Mr. J. P. Caird, an American engineer, who communicated the details to the *Journal* of the American Association of Engineering Societies. After the timber has been prepared in the usual way by steaming and vacuum, dead-oil is run into the cylinder, and so much as may be desired is forced into the wood, half a gallon of oil or less to each cubic foot of timber being about the quantity required. The oil is then withdrawn from the cylinder, which is charged with chloride of zinc, and this by pressure is forced into the timber through and beyond the oil. In this way the wood receives the advantage of the dead-oil treatment with the expenditure of one half, or less, of the usual proportion of oil, and the chloride surrounded by the oil is protected for a lengthened period against moisture. It is stated that this process gives the best result for the money invested.

UNDER the title "Compañía Anónima Exploradora de las Hucas del Inca," a company has been formed at Lima, in Peru, with the object of "exploiting" the sepulchres of the ancient Peruvian kings, in the hopes of recovering the extensive treasures of gold which tradition, hundreds of years old and handed down to the present day, affirms to be hid there. For generations these hopes have been kept alive among the Peruvians, and apparently with some reason. Tiabuaco, the Baalbek of the New World, lies a vast heap of ruins. Like Carthage it has been the convenient quarry for the building material



of many surrounding towns, for every village, every church, even the cathedral of La Paz in Bolivia, some three hundred miles off, has taken its stone from the ancient capital and necropolis of the Incas of Peru. A like fate has awaited the once-famous fortified city of Cuzco, where the enormous golden chain of Huayna Capac was kept, which was said to be long enough to go twice round the great square at Huacapata, the links, all of pure gold, being as thick as a man's arm. Some of the legends about these "tapados" or covered treasures are mentioned in ancient historical writings; thus Felipe de Pomares mentions the existence, beneath the Castillo of Cuzco, of a vaulted chamber containing the statues of all the Incas in solid gold, and that in his time a certain Dona Maria de Esquivel had actually seen them. This lady was the wife of one of the direct descendants of the kings by whom she was led blindfold into the vault. Again, the present aborigines all declare that the golden throne was cast into the Lake of Pultamarac, and that under the Temple of the Sun at Cuzco there is a "garden" with trees made of pure gold; when Humboldt was in Peru he heard the same story, and during the rebellion of Pumacacua, in 1814, the leaders are said to have found some treasures which helped them to pay their way: the rebels were defeated at Ayavere, and Pumacacua promised his captors a "mountain of gold" if they would spare his life; he was executed, however, and the secret perished with him. The ancient Incas undoubtedly possessed large quantities of the precious metal; many skulls have been found covered with plates of gold. In the Temple of the Sun the walls, columns, and cornices were also covered with gold; and the great Sun and idols were of pure massive gold. When Atahualpa was taken prisoner by Pizarro, he offered a "room full" for his life; Pizarro required "two rooms full," and messengers went to fetch it, but news of the death of their chief reached them, and they buried the treasure in the forests of Dianganati. Few of these hoards have since been found, so that the enterprising Compañia has a large field for search, and—very sanguine shareholders.

**T**HE *St. James's Gazette* of Saturday last, in an amusing article on "Christmas Annual-making," recounts how the manufacture of special effects and subjects comes in for a special value in these publications:—

"Some years ago two or three artists, although but little valued at other times, were always popular at Christmas from a certain dexterity in depicting mullioned windows with the light stealing from them on to the snow without, while rebused wanderers, hidden beneath the ivy, gazed in at the home of their youth. In fact, there is a story told of a publisher asking a question about the skill of one of these talented gentlemen, and being answered, 'I don't know much about his being an artist, but he's the best moated-grangeist I ever came across.'"

"Moated-grangeist" is good, as Polonius would have put it.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second ordinary meeting of this Institute for the present session took place on Monday evening last, Mr. Thomas Worthington (Vice-President) in the chair.

Mr. W. H. White announced the receipt of a bronze medal and diploma from Sir Herbert Sandford, on the part of the authorities of the Adelaide Exhibition, in recognition of the exhibit of photographs of recently-erected buildings sent by the Institute.

Mr. White also announced that the November examination of candidates for the Associateship commenced on Monday, the 26th of last month, and terminated on the 1st inst., when it was found that thirty-one out of the thirty-eight candidates who presented themselves had passed (applause).

Mr. White further stated that three members of the Council had offered a prize, to be called the Scientific Masonry Prize, of Ten Guineas,

with a second prize of Five Guineas, to any British Architect or Student of Architecture who should produce, to the satisfaction of the Council of the Institute, the best essay on the following subject:—"The Design of the Vaulting of the Entrance-hall to a Public Building."

Mr. J. Macvicar Anderson (Hon. Sec.) drew attention to the Church of St. Mary-le-Strand, which, as they were aware, had stood too long in a ruinous and discreditable condition. He believed every Member of the Institute would agree that it would be nothing short of a public calamity if the church were permitted to be removed (applause). There were Goths who desired to remove the church, on the score that the traffic of the Strand was impeded by it, and that its removal was necessary on public grounds. This allegation he had already taken upon himself to refute, inasmuch as the street opposite St. Mary-le-Strand was not the narrowest point of the Strand, which was at the neck of the bottle formed by the narrowness of that part of the thoroughfare opposite Mr. W. H. Smith's premises. The proper way to remedy this was by what had been more than once suggested, namely, to throw back the rubbishing houses occupying the north side of the street (applause). The view of St. Mary-le-Strand, from whichever side it was looked at, was one of the most beautiful street views in London, and he believed every one would strongly deprecate anything being done to destroy it. He had been asked by the rector and churchwardens to examine the church, and he had made a very careful examination, he need not say with great interest and delight, and had come to the conclusion that there was no difficulty whatever in renovating it at a very reasonable cost. He could scarcely believe there would be any difficulty in getting the public to subscribe. At all events, he would like to be in the position of having the sympathy of the Institute in giving expression to similar views to those which he had now ventured to express (applause).

Mr. Francis Hooper (Pugin Student, 1882; holder of the Godwin Bursary, 1888), then read a paper entitled "Building Control in Paris, with Notes on its Administration." The following is the substance of the paper:—

The task I am about to attempt is that of laying before you an outline of the chief provisions for regulating building enterprise in Paris and the agencies for their administration.

I cannot, however, proceed without expressing grateful recognition of the value of the Bursary, so liberally founded by the late Mr. George Godwin, to which I owe the opportunities I have enjoyed of studying my subject, nor can I omit to record the kind assistance afforded me by the Under Secretary of State for Foreign Affairs, and His Excellency the British Ambassador in Paris, in furnishing me with letters of introduction; by M. Alphonse, Directeur des Travaux de Paris; and the honorary and corresponding members of this Institute, and by many others, of whose courtesy I shall always retain most pleasant reminiscences.

No new building, reconstruction, or addition may be commenced in any of the streets of the city, which all belong to the *Grande Voirie*, without the permission of the central administrative authority, which is the Préfecture of the Seine, resident at the Hôtel de Ville. The Prefect of the Seine exercises all the functions of Mayor of Paris with the exception of the control of the police. The police force is under the command of the Prefect of Police, who, like the Prefect of the Seine, is appointed by the Government, and, in his capacity of guardian of the safety of the streets and places of public assembly, administers the building regulations in regard thereto. The whole of the streets of Paris have, for purposes of simplification, been classified as belonging to the "Grande Voirie"; all building operations are, therefore, subject to control of the Prefect of the Department. The general classification of the roads throughout France as national, departmental, and parochial has been described by M. Waddington, the French Ambassador in London, in two most interesting articles on Local Government in France this year, in the June and July numbers of the *Nine-month Century*. The small coloured map of the environs of Paris exhibited shows the classification of the roads immediately beyond the city boundaries. In order to obtain the necessary permission, application must be addressed in writing to the Prefect on *papier timbré*—that is, paper bearing the Govern-

ment duty stamp of 60 centimes,—and must be accompanied by drawings.

Drawings for the erection of a new building must comprise plans of each storey, together with a cross-section showing the height and general construction, to a scale of 0.02 m., or about  $\frac{1}{50}$  in. to the foot.

The *Law of Alignment* is for the purpose of adjusting the frontage of property abutting on irregular streets. Its application involves a "servitude" on all land which does not conform to the authorised alignment, preventing the erection, reconstruction, or structural repair of any building thereon, and which it is the duty of the Commissaire-voies to see observed. It becomes necessary before sanctioning building operations along the public way to consult the Plan of Alignment. The *Loi d'Alignement* had its origin in the reign of Henri IV., 1607, when application for permission was required to be made to the Grand Voyer of the King before any building was commenced bordering on the *grande voirie* or highway, thus securing to him power to regulate the lines or frontage. About a century later, the need for systematic procedure becoming apparent, decrees were issued that every town having 4,000 inhabitants should prepare plans of its streets, together with recommendations as to the future lines of frontage to be adopted. The plans were prepared to uniform scales, one consisting of a general map of the town, the other giving, to a larger scale, all buildings abutting on the streets. The proposed lines of frontage recommended by the Mayor and Council were drawn in red; yellow colour showed the area of ground to be contributed to the thoroughfare; whilst blue showed any frontage that might be advanced on the then existing lines. These plans were submitted, through the Prefect of the Department, to the Minister of the Interior with observations, and, if approved finally by the chief of the State, was decreed as binding on every owner building or reconstructing his property along the high way. Thus it is that throughout France will be found plans upon which systematic alignment is in progress or has already been carried out. The equity of the "Servitude of Alignment" is based on the principle that the thoroughfares are public property; buildings, therefore, erected along them enjoy light, air, and convenience from their proximity, and their individual owners are held to reciprocally contribute to the enjoyment and convenience of the public.

When, from whatever cause, the owner of property to be set back desires to rebuild, the new alignment is followed unhesitatingly, and should he not be satisfied with the offer of compensation made to him by the municipal authorities, he can appeal to the jury at their next sitting for a consideration of his claims, and whose award is binding on both parties, unless taken before the Cour de Cassation. In the estimate of compensation no consideration is given to buildings on the ground to be vacated, as the owner may enjoy their use until from decay or other causes, his property becomes subject to condemnation as dangerous to the public, and reconstruction would be necessary at his expense. In the valuation of the land much depends on the free space in the rear of the house. If only garden land the compensation is based on its value. If sufficient ground does not exist for rebuilding a healthy house, the whole site is purchased and offered at a price to the adjoining owner. Should the adjoining owner be either unwilling or unable to purchase the residue, even on the valuation of the jury, it is possible for the authorities to acquire his property by the agency of the "Law of Expropriation on account of Public Utility," and to dispose of the two sites as they deem best.

This law, not being costly in execution to the community, is applied in all the provincial towns of 4,000 inhabitants and upwards, as well as in some of the streets of Paris, where the exceedingly slow operation is not of great inconvenience.

The "Law of Expropriation on Account of the Public Utility" provides for the immediate acquisition of property by Municipal or other authorities, required for varying purposes, such as sites for public buildings, monuments, new streets, railways, &c., as well as buildings required for improvement, of the sanitation of a district. In order to secure the rights of the individual, three operations of great import-



ance are necessary in the application of expropriation:—

1. "The Declaration of Public Utility," by the State.
2. "The Judgment of Expropriation," by the Court of Justice.
3. "The Award of Compensation," by the Jury.

The necessary plans having been prepared, in accordance with certain general instructions, to fully demonstrate the scheme and the extent of the property proposed to be acquired for its execution (specimen exhibited), an *enquête préliminaire* is held at the Mairie of each arrondissement in which such property is situated. The *enquête* is announced by placards posted throughout the arrondissement (specimen exhibited), by advertisements in the local newspapers, and for fifteen days the plan is exhibited, that the owners and others interested may examine it and record their observations in writing. For three additional days a *commissaire enquêteur*, appointed by the Prefect, receives and records all verbal observations made to him at the Mairie with regard to the scheme. These observations may relate either to its questionable necessity or its efficiency, the excess of property to be expropriated or the insufficiency, as well as questions on the accurate representation of the several properties. The *Commissaire-enquêteur* also furnishes a full report, giving also his opinion on the scheme, which is forwarded, together with all the other documents, to the Conseil Municipal. The Conseil may determine to modify the scheme in accordance with suggestions offered, or to maintain the original plans. The plan and reports are next submitted by the Prefect of the Department, with his recommendations, to the Ministry of the Interior. The project is examined in the "Bureau de la Voirie," to which the whole of the thoroughfares of France are subject. If still approved, the documents are submitted to the "Council of State," and the scheme becomes effective by the signature of the Chief of the State to the "Declaration of its Public Utility." If technical advice be required on an architectural question involving, may be, the selection of a site of an important public building or the relation of a new street to national monuments, the Minister of the Interior will consult the "General Council for Civil Buildings." The constitution of this Council has been most ably described by Mr. W. H. White, in his work on "The Architecture of Public Buildings in Paris and London." In matters such as railways, bridges, or canals, the Minister of the Interior may consult the "Conseil Général des Ponts et Chaussées," such advice being usually followed.

*Expropriation* is the second stage of the procedure, and can only be pronounced by the High Court of Justice, when it has assured itself that provision is made for adequate compensation to all whose property and rights are to be acquired on the ground of "public utility." A second enquiry is therefore held, publicly announced like the first, and extends over eight days, during which time a "plan parcellaire" is exhibited. This plan, with certain additions (specimen exhibited), is the same as the former. All the properties to be acquired are numbered consecutively, and a list is attached to the plan giving the names of the several owners, copied from the "matrice cadastrale" or official register of property, together with the tenants reported by the *Commissaires Voyers* as having claims to compensation. This second *enquête* permits the notification of any interests which have been overlooked, and the correction of any errors in the description of property. The Court of Justice pronounces "expropriation on account of public utility," and, in the case of municipal improvements, a decree of cessibility by the Prefect renders the occupants of the property only tenants "at will" of the Municipality. The judgment of the Court is made public by advertisement, together with the offers of compensation made by the Municipality. If these offers are not accepted within eight days, application is made to the Court of Appeal for the appointment of a jury.

The *Award of Compensation* is made by a jury of twelve persons, selected from the special jury list, presided over by a "magistrat-directeur," being a judge of the Civil Tribunal. Claimants appear in person or by counsel, the jury making their award after a visit to the property. The awards are published in the official newspapers, together with the offers and claims, and are absolutely binding, unless notice

to the Court of Appeal is given within fifteen days.

*Line of Frontage.*—The first consideration in all proposals for new buildings or reconstruction is the line of frontage to be adopted. This is ascertained by reference to the plan of Paris in charge of a special service at the Hôtel de Ville, on which are shown the lines of all authorised new streets as well as frontages to be adjusted in old thoroughfares.

*Height of Building.*—Dependent on the distance between the authorised lines of building frontage which, until the realignment has been carried out, does not always correspond with the effective width of the street, is the limit of the height of the building. A scale of dimensions fixes the maximum height of the front wall in proportion to the width of the street, as shown by the diagram exhibited, but, whatever may be the width of the street, square, or quay no wall abutting on the thoroughfare may exceed a height of 65 ft. 6 in.

*Height of Roofs.*—The outline roofs must be contained within the perimeter produced by describing a semi-circle, springing from the external face of the enclosing wall, having a radius equal to half the effective width of the street, but in no case exceeding 27 ft. 6 in. Dormer windows may extend 1 ft. 8 in. beyond the arc of the roof, but may not project over the wall, nor exceed in collective width two-thirds the length of building frontage. These regulations apply equally to buildings set back from the public way and to private thoroughfares and passages, always excepting that the enclosing walls of a staircase constructed in a courtyard may extend beyond the perimeter, in order that they may rise to the level of the ceiling of the highest floor served by such staircase.

*Height of Storeys.*—In all buildings the height of the ground storey, measured to the ceiling, shall not be less than 9 ft. 2 in.; the basement and other storeys not less than 8 ft. 6 in.; the storeys in the roof being measured to the highest part.

*Courtyards and Air-shafts.*—These are classified, as those which serve to light and ventilate: first, living-rooms; second, kitchens; third, water-closets and passages. The minimum area of each is precisely defined, being dependent on the height of the enclosing buildings. Provision is made for air-circulation in the event of any of the areas being roofed with glass. Several proprietors on making a formal contract with the City of Paris to maintain in perpetuity courts in common, these courts being together one and a half times the authorised area, the proprietors are permitted to raise their buildings to the height corresponding to the larger area. In the case of the union of several courts the height of the division wall must not exceed 50 m. The effect of these provisions is to render "light and air" disputes almost unknown.

*Position of Windows.*—The distance from party walls of windows not lighted from the street is the subject of legislation. This, however, is not administered by the Prefecture.

*Number of Storeys.*—The number of storeys above the ground is limited to seven, including the entresol and attics.

*Central Administrative Service.*—The "Department of Works" of the Prefecture of the Seine is presided over by a Director, assisted by a Sub-Director. The responsible office of Director has long been filled by M. Alphand, a distinguished engineer, known to British architects by the interesting works, published under his supervision, to illustrate the artistic and scientific developments of the city of which he is justly proud. M. Huet, the Sub-Director, is, like M. Alphand, an Inspector-General of Ponts et Chaussées. It comprises three main divisions, each of which has its responsible chief.

1. The water, canal, and drainage services.
2. The public thoroughfares.
3. The buildings belonging to the Municipality.

*Divisional Service.*—The second division, which has charge of the public thoroughfares, deals with all applications for permission to build, defines and verifies all lines of building frontage and levels, maintains the roads and footways, trees, street-lighting, &c., negotiates for the sale and purchase of property, and superintends the execution of street improvements. To M. Deville, the chief of this division, I am indebted for invaluable assistance in collecting particulars of the laws in force for effecting street improvements, and the method of their application.

*Service du Plan de Paris.*—This service, though independent of the three main divisions

of the Department of Works, and responsible only to the Director of Works, is closely associated with all the operations of the Division of Public Thoroughfares. The work of this service is, to preserve a correct plan of the city, showing the authorised alignment of every street, for the purpose of determining the lines of frontage to be followed in the case of applications for permission for new buildings or reconstructions bordering on the public streets; to prepare plans of all property bought or sold by the Municipality; and to elaborate schemes for new streets and the improvement of those existing. To the chief of this service, M. Hochereau, himself an architect by education, I am indebted for most kind assistance in collecting the plans and maps which I am able to exhibit. The wise forethought in matters of street improvement is well exemplified by a work published in 1878 (by the Prefecture of the Seine), entitled "Projets de Voirie," a copy of which I am able to exhibit. This work is a register of the various schemes which have been drawn up from time to time. These are classified (by Arrondissement) as street widenings or new thoroughfares. A description of each is given, with details of its length, the ground to be thrown into the roadway, the estimated cost of acquiring the necessary property, cost of construction and selling value of surplus land resulting in the approximate cost of execution. With such a register any Municipal Councillor or ratepayer can, without difficulty to himself or labour to the authorities, ascertain what improvements have been contemplated in his own locality.

*Active Exterior Service.*—The active staff of the Division of Public Thoroughfares, whose duties are very similar to those of the District Surveyor in London, have the title of *Commissaire-voyers*. The *Commissaire-voyer* is appointed by the Municipal Council after evidence is produced of his technical training and competence, either by certificates and diplomas or by reference to executed works. The appointment is permanent, and remuneration is by a salary, increasing according to length of service. These voyers are twenty in number, and are each being charged with the supervision of the building operations in one of the arrondissements of the city. Each has an office at the "Mairie" of his arrondissement, and is assisted by a *Commissaire-voyer-adjoint*, or deputy. The *Commissaire-voyer-adjoint* is usually a successful student of the Architectural Section of the École des Beaux Arts or of the École des Ponts et Chaussées, who has passed the necessary qualifying examination. The examining board consist of three of the engineers of the service and two *Commissaires-voyers*. The subjects dealt with include drawing, geometry, physics, building construction, administrative law, and building regulations. The qualified candidates must not be less than twenty-five nor more than thirty-five years of age, and being placed by the examiners in order of merit, fill by rotation the vacancies as they occur. The examinations are held only when the list of qualified candidates is exhausted. Each *Commissaire-voyer* is required to reside within the arrondissement to which he is appointed. He is free to practise as an architect or expert only beyond its limits, and he may not act as expert in matters which the Municipality has interest in. The voyer is regarded, in cases of building infringement, as voyer of the whole of Paris, and is consequently held to report every instance which he observes. The fines imposed on the erring proprietor are handed to the voyer who first gave notice of an infringement. A report is rendered every three months, recording the various building operations, also works authorised but not commenced, as permissions are invalid at the expiration of twelve months. Cases of importance and difficulty can be submitted to the *Commission Supérieure de la Voirie*, of which the Director of Works is president, the sub-director vice-president, its members being the Chief of the Bureau of Alignments, the Chief Engineer of Streets and Promenades, the Chief of the Division of the Highways, three *Commissaires-voyers* as permanent members, two *Commissaires-voyers* appointed for one year only.

#### PREFECTURE OF POLICE.

*General Building Regulations.*—The police regulations are chiefly such as provide for the safety and convenience of street traffic. No barrier, hoarding, scaffold, shoring, or ladder, may be erected in the streets or thoroughfares without permission. Applications must



be addressed to the prefecture, on paper timbré, defining the nature of the requirements, and permission is granted only upon production of the approval of the Prefecture-of-the-Seine to any intended building operations. No fees are due in respect of these applications. The construction of temporary erections for fairs, processions, &c., are all subject to police control. Theatres, places of public assembly, the factories of dangerous trades, prisons, &c., are subject to periodical inspection, and their construction to requirements of the police architects, based on carefully prepared bye-laws regulating the entrances and exits, mode of lighting, fire-hydrants, &c.

**Active Exterior Service.**—The active staff consists of ten architects, each responsible for the fulfilment of the police regulations in matters of building works within a district comprising two of the twenty arrondissements of the City, to the Superintending Architect (*Architecte-contrôleur*), whose office is at the Prefecture of Police. Vacancies in the staff of Architects to the Prefecture of Police are filled in rotation by candidates who have passed a qualifying examination conducted by the sitting architects. This examination, involving a knowledge of building construction, jurisprudence, and special practice, is held only as occasion requires. Remuneration is by salary increasing every three years, until a fixed limit is reached. These architects carry on private practice, but, when undertaking work within their own district, are required to give notice to the superintending architect. The duties consist in reports on all applications for permission to erect barriers, scaffolding, &c., with recommendations for best securing the safety and convenience of traffic, periodical reports on the condition of the theatres, *salles des spectacles*, factories, &c., which are allotted to them independently of the limits of their respective districts. At a weekly meeting of the police architects reports and recommendations are submitted for the signature of the Superintending Architect, who presides, and who, in endorsing the reports, accepts the responsibility of their execution. Matters of difficulty are brought before this meeting, and action is taken after united counsel. The Superintending Architect undertakes personally the inspection of prison buildings.

I conclude this report by respectfully submitting that the course adopted with such eminent success by our public-spirited neighbours in Paris for the improvement of their city, should stimulate the efforts of British architects and engineers to educate the public, and especially Londoners, to the fact that expense wisely incurred in municipal improvements is not money lost. Spacious, well-planned thoroughfares facilitate rapid communication, and hence the transaction of business; they likewise promote the health and therefore the wealth of the inhabitants. Good approaches to the great railway termini would tend to promote suburban traffic, to the relief of the congestion of our central districts. The well-to-do inhabitants could live in our city with greater comfort, whilst the poor would not be so restricted in the choice of locality, as rapid transit would bring them quicker to their field of labour. Parisians already envy us our Inner Circle Railway, and this if organised in conjunction with our other railway services, might be made of still greater value.

London possesses great natural advantages: its tidal river, its subsoil, its water-service, facilities of drainage, and cheap building materials.

Mr. William Woodward, in opening the discussion, said he was sure that if Mr. George Godwin had lived to be with them that evening, he would have been delighted at the success of his liberal foresight in providing the Bursary which bore his name. He (the speaker) had had the pleasure of listening to all the papers that had been read by the holders of the Godwin Bursary. They had been excellent papers, but he believed that of Mr. Hooper would rank with the best of them, and be of great benefit to those who were engaged in the study of architecture, and particularly those who were preparing for the Architectural Examinations. The moment for the production of Mr. Hooper's paper was singularly opportune. London at the present time was in a state of what might be called transition; the body created by the Act of 1865 would shortly cease to exist, and London would be governed by a County Council, though whether that Council would secure better im-

provements than the Metropolitan Board remained to be seen. All that they could hope for was that it would secure them. If there were members present who favoured the proposal for leasehold enfranchisement, Mr. Hooper's paper would delight their hearts. It had been said over and over again that if ever that Bill became law, it would be absolutely necessary that some of the propositions named by Mr. Hooper,—which gave such immense power to the Municipal authorities in Paris,—should be introduced into London, otherwise the advantages secured would be small, and individual freeholders would be at liberty to do as they liked. With regard to the rights of light, Mr. Hooper had endorsed the views of many of them. Many architectural schemes in London were spoiled by the action of the owners of dominant lights; and, whilst he agreed with Mr. Hooper that there were many cases of extortion, his opinion was that the frequent litigations which arose in London on the question of the rights of light owed their origin very largely, if not entirely, to the action of the architects of proposed new buildings. Those architects, when they pulled down houses and attempted to erect larger buildings, knew well the rights of the opposite neighbours. Therefore it was within their power, when they were designing buildings, not to interfere with the rights of the adjoining owners. One of the most important parts of Mr. Hooper's paper was that which dealt with the question of street alignment, which was absolutely essential for the well-being of every city. If the rules or regulations enforced in Paris had been so enforced in London, the alignment would have been improved, and, in place of tortuous cab-rotutes, there would have been magnificent thoroughfares, with the street alignment properly considered. Their late President, Mr. T'Anson, had told them that the same excellent system was followed in Rome, the plans of proposed improvements and street alignments being exposed for fifteen days. A new street was now being formed from Holborn Town Hall to the Angel, Islington, at a cost of half a million. This was a very important street, because it became a connexion with the great western thoroughfare of Shaftesbury-avenue, and it also took part of the traffic of Gray's Inn-road; yet, notwithstanding the fact that Gray's Inn-road was 60 ft. wide, this new street was only being made 50 ft. wide for building. This had been done because nobody knew anything about it, and no doubt a strong outcry would be made when it was too late to be corrected (applause). He had to mention another subject, and in doing so it was only due to the Superintending Architect of the Metropolitan Board of Works,—Mr. Blashill,—to say that he had as great a regard for the health and beauty of the metropolis as any architect in the room, so that anything he might say must not be considered as in any way addressed to that gentleman. By an Act of George II., a new road was formed from Islington to Paddington, and the authorities of those days considered that, for the beauty of the avenue, the houses should be set back 50 ft. from the road. They all knew the encroachments which had taken place from King's-cross to Baker-street, but hitherto from Baker-street not a single encroachment had taken place upon the 50 ft., the result being a magnificent vista bordered with trees and shrubs. Only during the last three months an application had been made to the Metropolitan Board of Works for permission to take down four houses, just west of Seymour-place, and to erect a structure encroaching 45 ft. upon the 50 ft. The application was sent in in the usual way to the local authorities,—the Vestry of St. Marylebone, who considered the matter in a public spirit and refused the application, which, however, was eventually allowed by the Metropolitan Board of Works in the face of the opposition of the local authorities, and in the face of the Act of George II. So that this was the encroachment of the projection of the line of frontage, and every house in due course would look upon that as the true line of frontage. Had the French system obtained in London, such vandalism could never have happened, for public opinion and criticism would have prevented it (applause).

Mr. Charles Fowler proposed a vote of thanks to Mr. Hooper for his valuable paper. It might be in the memory of some present that in 1874 the Metropolitan Board of Works proposed an amendment of the Building Act, which, amongst other things, contained provisions to limit the height of buildings; but, in the end, the Bill was thrown out. The Select Committee of the

House did not think it desirable that the buildings should be limited in the way proposed, and, if any legislation on that point was carried out, it would have to be done with great care, so as not to interfere with the architecture. He believed a short Bill was still before the House of Lords, proposing to limit the height of buildings; but it was so crudely and negligently drawn that he could hardly conceive its being passed. It, however, showed what was in the air, and it would be necessary for the Institute to take some steps to see that legislation followed the right course. As to the principle of the prescriptive right of light, he, for one, could not understand why a man, because he had made a window looking over his neighbour's ground, and had enjoyed uninterrupted use of that window for a limited period, should have a right for ever to prevent that neighbour enjoying his ground (applause). He was glad to learn that prescriptive right did not exist in Paris.

Professor Kerr seconded the vote of thanks, and said that the paper raised some very important questions. The feature of the paper which struck him most forcibly was this, that throughout the whole administration of architecture in Paris there ran the principle that architects should govern, while in England the reverse was the case. He did not blame the English Constitution for that. The French considered that all buildings should be administered upon a systematic and well-regulated plan, the public governing the individual; while in England such matters seemed to be entirely unknown. The liberty of the individual here was so sacred that people were most jealous of its being interfered with, even in the most modest way. So that even when they established the Metropolitan Board of Works, the members possessed no architectural knowledge, with the exception of one or two who had made slips in their misuse of it. The Board of Works, a typical English institution, did not refer architectural matters to architects. The rule of this country was,—and not in respect to London alone,—that architects were not referred to in architectural matters, and he wished to know the reason why. If the French system were followed here, London might become very much improved. The acquisition of a prescriptive right to light was really the outcome of the idea that neighbours should accommodate each other, but the inconvenience that arose in London from the practical application of the law of ancient lights was indescribable. It came to this, that a shopkeeper in a back street would seriously argue that his neighbour was not to be allowed to put one brick upon a fence wall without his leave; while the trouble into which neighbours got, and the hallucinations under which they suffered as regards their rights, was very great (laughter). As to an alteration of the law, the matter had been somewhat extensively discussed at the Institution of Surveyors, who had come to the conclusion that if the Law Courts would admit experts, as the law enjoined them to do, for the decision of all questions of ancient lights, there would not be so much trouble as there had been in the past.

Mr. R. Phénix Spiers advised his hearers to take the earliest opportunity of visiting the church of St. Julien des Pauvres, Paris, shown on one of the plans, as it was about to be pulled down for one of the street improvements.

Mr. Thomas Blashill (Superintending Architect, Metropolitan Board of Works,) said it was extremely useful to know what was being done in important cities like Paris, but it must be remembered that the conditions were different from those of London. He believed that if the Institute were to give a decided opinion upon some of these vexed questions, it would have considerable weight outside. A great deal of work appeared to be managed in Paris by boards of officials. This bureaucratic tendency was due, he believed, to the difficulty of getting large bodies of unpaid men of intelligence to do the work. He did not think that such an arrangement would be acceptable to the people of London in the present state of public feeling. Reference had been made to the new street from Holborn Town Hall to the "Angel," but in criticising the width of it, it was hardly fair to say that a street 50 ft. wide was being made to take the traffic of one 60 ft. in width, because that was not the fact. Mr. Woodward, too, seemed to forget that the Act of George II. he had referred to had been repealed.

Mr. Woodward said he believed that this was just the point upon which lawyers differed,—





Illustrations of Mr. Walter Crane's Lecture on "Design."

whether the Act in question had or had not been repealed.

The vote of thanks on being put to the meeting was carried by acclamation, Mr. Hooper briefly replied.

The Chairman announced that the next meeting would be held on December 17.

#### ARTS AND CRAFTS EXHIBITION SOCIETY:

##### MR. WALTER CRANE ON "DESIGN."

It is not strange that the announcement of lecture by Mr. Walter Crane should bring together a large and eager audience.

The lecturer's platform was hung round with designs bearing his characteristic impress, and in the centre was placed a large black-board.

After a short, but appropriate, introduction, Mr. Crane proceeded to lay down in clear and unaffected language the aims and limitations of decorative art.

Art, he said, had, like the shield in the fable, two sides,—the purely pictorial and the frankly decorative. In the exercise of the first the artist sought to give the effects of certain aspects of nature, with but little or no attempt at selection. An easel-picture is complete in itself. Its form and expression are entirely at the discretion of the painter, who is conditioned only by the medium in which he elects to work and the restrictions which he himself imposes.

By the aid of numerous artifices he repeats the aspect of the natural world, as he sees it, and gives, with all attainable exactness, a certain number of facts,—outline, colour, rotundity, chiaroscuro, &c. He cannot give them all.

The decorative artist, on the other hand, is severely conditioned as to form, material, position, distance, &c. He works under many restraints not self-imposed or variable. His aim is the expression of another order of facts, and the attainment of ideal beauty by selection, adaptation, suggestion, suppression, exaggeration.

He gives not light and shade, but light masses and dark; and the elements with which he works are the adjustment of agreeable outline and the right balance of opposing forms. He is, before all things, guided and restrained by the material in which he works, striving to preserve its characteristics, the "agreeable looseness" of beaten metal, the crispness of the carved wood, the effect of the plasticity of clay, and so on.

The degree of naturalism which he reaches must depend upon these. He cannot give, like the pictorial artist, the wayward growth and multitudinous leafage of the oak; but he can give other truths about it, no less interesting, which the pictorial artist does not reach,—the serration of its leaves, the structure and delicate beauty of its fruit, and the way in which the ruddy acorns are seated on their sturdy stems.

In the wisdom with which the decorative artist selects for representation such facts of

nature as are decoratively effective under given conditions his success depends.

For his purpose he has all known forms at his service. The square and its allies and derivatives give him a series of almost infinite variety, and the circle and its derivatives another; and he has, moreover, inexhaustible resources in the combination and opposition of these, and in such systems as spring from alternating curves and radial lines. These latter are the most generally useful, and are found throughout all nature in the feathers of the bird's wing and the ribs of the shell, and they are alike seen in the drapery of a Greek statue and the fan-groining of a Gothic cloister.

But above and beyond all these, the designer has at his command the subtle lines of the human figure. Their play and flexibility enable him to fill spaces of every form, and by means of them he can embody his happiest thoughts.

All good art is related art, and upon the rightness of its relation the success of all decorative art depends. The Parthenon frieze remains the highest effort of man's genius as a decorative design; but if applied to the walls of Westminster Abbey all its charm would be lost.

It is the want of a sense of due relation which has heretofore degraded all previous art. To it succeeds a superficial naturalism, which is its death. By this all the ancient arts have perished, and it is to rescue contemporary art from such a fate that a strenuous effort is now being made.





Minehead Church

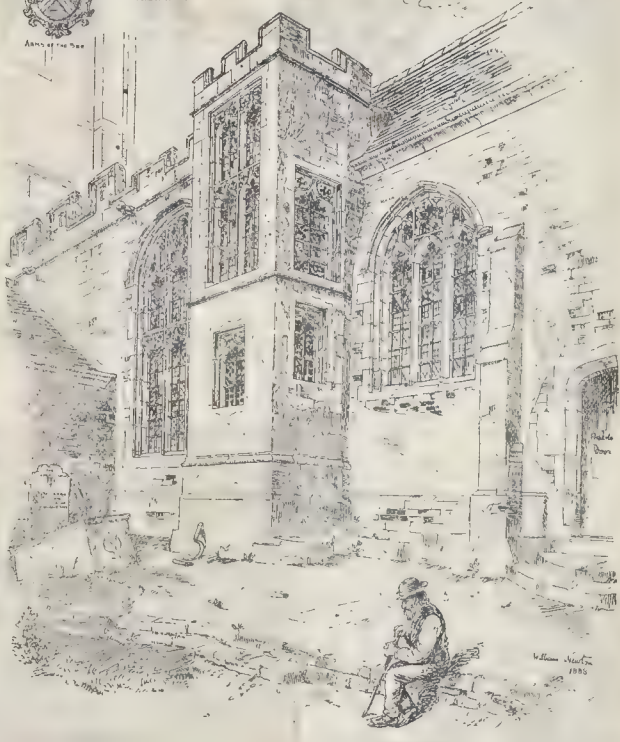
Rood Loft Turret &amp;c



Arms of the See



Place of interest



## NOTES ON THE PARISH OF MINEHEAD.

The Manor of Minehead is of very ancient origin. It is mentioned in Domesday, and was given by William the Conqueror to William de Mohun; at a later time the Manor passed from the Mohuns to the Luttrells, its present Lords, as did the adjoining Manor of Dunster. The town is divided into three parts: the upper town, composed of picturesque cottages and stepped streets leading up to the church, which is situated on the slope of a large hill called Greenaleigh or Minehead Point; the middle town, about half a mile from the beach, and the quay town by the water's edge, under the brow of the Point, which is about 700 ft. high.

The town was incorporated by Queen Elizabeth and endowed with great privileges. The quay was built in 1616 by George Luttrell, and a new head was added by Colonel Francis Luttrell in 1688. The country on the land side, bordering as it does on Exmoor, is very beautiful, being a continued succession of lofty hills and rich vales.

The chest, illustrated in this week's issue,† is carved in high relief, as may be seen by the sections. The upper part consists of two cupboards, with a small shelf running round each; the lower part of two drawers. The bird with a book is supposed to represent an eagle, an emblem of St. John. The fish with the three stars is most likely the arms of I.M.C., whose initials are entwined in the front panel, and at whose expense the chest was probably made.

Leland says, in his "Itinerary":—

"The fairest part of the Town standeth in the bottom of an hill. The residew renneth steppe up a long the hille, yn the toppes wherof is a fair Parochie Church."

The church is a large handsome structure, 116 ft. long and about 42 ft. wide, consisting of nave, chancel, north aisle, and a chapel, now used as the vestry. An embattled tower at the west end, 90 ft. in height, contains a peal of bells

and chiming clock, a mechanical figure striking the hour. On the south side of the tower is a niche with a statue of St. Michael, to whom the church is dedicated. Behind the rood-screen in the north aisle are several chained books on a shelf, amongst which are a black letter Bible and Bishop Jewel's sermons; other objects of interest are some monumental brasses, a Jacobean pulpit, and the altar-table.

In the chancel is a tomb, said to be that of the celebrated lawyer Henry de Bracton, whose fame is principally founded on his learned treatise on the Laws and Customs of England. He flourished about 1240 A.D.\* The canopy over his tomb has just been restored and replaced. About a mile from Minehead is Bratton Court, which contains some of the original wooden traceried windows. Over the principal gateway is a room called the "Judges' Chamber," which tradition says was once Bracton's study. On the north side of Bratton Hill, in a deep glen, are the ruins of what report says was once a chapel, called Burgandy Chapel, probably the ancient retreat of some recluse.

Fronting Minehead market-place is an almshouse, containing eleven dwellings, built by Robert Quirk, a great number of whose family are buried in the church. On a brass plate over the door is this inscription:—"Robert Quirk, sonne of James Quirk, built this House Anno 1630, and doth give it to the use of the poore of this parish for ever, and for better maintenance I do give my two inner cellars at the inner end of the key, and cursed be that man that shall convert it to any other use than to the use of the poore, 1630." Below is a ship engraved, and underneath:

"God's Providence  
Is my Inheritance."

R. Q.

The churchyard, which is entered by a stone lych-gate, contains a cross, with four steps, of the ordinary type; there is also the base and shaft of another in the town.

W. N.

\* Collinson's "History of Somerset."  
† See Lithograph plate.

\* Savage's "History of Carhampton."

Where carpets are strewn with naturalistic flowers, tied in bunches with naturalistic ribbon; where the wood-carver sets himself to emulate the fluff and feathers of a dead bird; where the tapestry-worker seeks to reproduce the effects of a landscape in oil, and where everything is striving to look like anything but what it is, the Arts and Crafts are in a bad way.

It will be gathered from the above hasty summary that there was nothing absolutely new in Mr. Crane's address. The same doctrine has been preached before. It is eminently orthodox, and, like some other orthodox doctrines, very much neglected. Mr. Crane gave new and admirable force to old views and warnings, which were, perhaps, "ne'er so well expressed"; but he did more. He accompanied his remarks by designs upon the black-board before him in illustration of his meaning, which drew from his hearers uncontrollable applause. All forms came as freely from his practised hand as the principles he enunciated flowed from his ready lips, and again and again he roused his audience to enthusiasm.

We are enabled to produce, for the benefit of those who were unable to be present, a selection of the designs used by him, but we cannot convey any adequate idea of the ease, rapidity, and grace with which similar designs were developed by him as he discoursed.

The spandrel in the left-hand top-corner of page 412 is meant to show the adaptation of the human figure to filling a space of that character. The smaller and winged figure shows another treatment. The winged figure bearing a lamp illustrates the filling of a different-shaped space. The figure in the right-hand top-corner illustrates a design for filling a square panel. The other diagrams are self-explanatory.

**Society of Painters in Water-colours.**—We must defer till next week any notice in detail of the admirable winter exhibition of this society, one of the best they have ever held.

**Assistant-Borough-Surveyorship, Leicester.**—The Highways and Sewerage Committee of the Borough of Leicester, at their meeting on the 30th ult., decided to appoint, subject to the approval of the Town Council, Mr. Charles Mason, Deputy Borough Engineer of Nottingham, to the post of Assistant Borough Surveyor of Leicester. Mr. Mason is an Associate Member of the Institution of Civil Engineers, an Associate of the Royal Institute of British Architects, and a member of the Council of the Nottingham Architectural Association, and has been in the service of the Nottingham Corporation for a period of eight years. There were 165 candidates for the vacancy at Leicester.

## Illustrations.

BATTERSEA FREE LIBRARY:  
SELECTED DESIGN.

**W**E publish a view and plan of the premiated design for this library. The walls are to be faced with red bricks supplied by Richardson & Co., Brunswick Wharf, Vauxhall. The carving is to be executed in brick also. The roofs are covered with Broseley tiles. Portland stone is used for dressings. There is to be an open-timbered roof over the reference library. The book-shelves, &c., are to be of pitch-pine.

The architect is Mr. E. W. Mountford, A.R.I.B.A., and the builder is Mr. James Holloway, of Lavender-hill.

## SECOND PREMIATED DESIGN.

This design was prepared in accordance with the very carefully-made list of "Instructions to Architects," and was the result of careful study of the site and its special requirements.

The author's desire was to so plan each floor as to secure the following points, viz.:—1. Ample and direct ingress and egress. 2. Comfort in the use of the building. 3. Ease of administration and supervision. 4. The best sanitary arrangements. 5. Provision for future growth.

The entrances to the library, librarian's house, and caretaker's house were placed in the Lavender-hill front, by this means securing to each the benefit of the best frontage, while keeping every exit and entrance under the eye of the principal.

On the ground-floor are the lending library, news and magazine-rooms. On the first-floor, the reference libraries. On the second-floor, book stores and cloak-rooms. The basement is devoted to book stores and administration.

The number of volumes, calculated at ten volumes per foot superficial, that the design would accommodate was practically 110,000.

It was proposed to heat the premises by low-pressure hot water, and care was taken to provide large inlets for fresh air and extracts for foul air.

Externally, the design was for a simple yet effective building, partaking of a public character. The authors of the design were Messrs. T. Chafeld Clarke & Son.\*

## COTTAGES AT LEICESTER.

THESE cottages have been built for Mr. J. H. Cooper, for the accommodation of workmen, on the Saint Barnabas Estate. Each cottage has a private entrance and contains parlour, living-room, scullery, pantry, and coal-place on the ground-floor, and three bedrooms on the chamber floor. The w.c.'s and dust-bins are built away from the main buildings, adjoining the backway to the cottages. The two end cottages are larger, and contain four bedrooms each. The materials used are dark red facing bricks, and red Broseley tiles for the roof.

Mr. Isaac Barradale, F.R.I.B.A., Leicester, is the architect. The illustration is taken from the drawing exhibited at the last Royal Academy Exhibition.

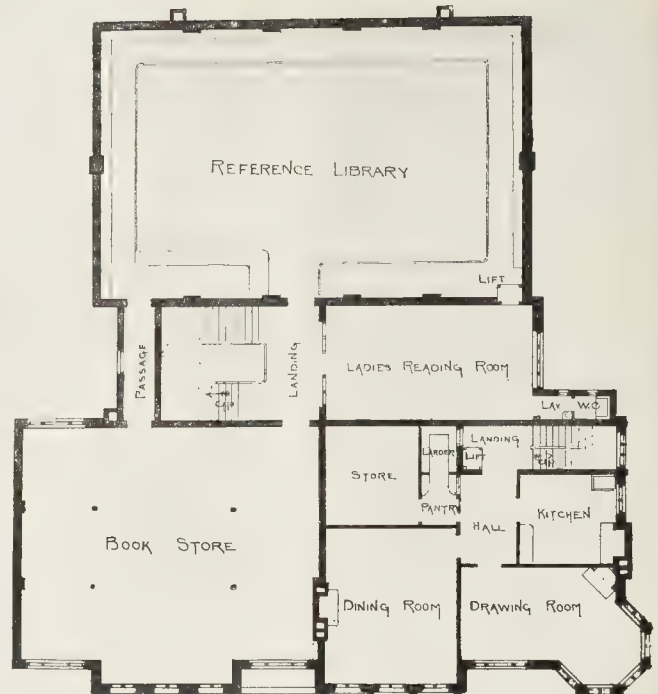
## OLD COTTAGE ARCHITECTURE.—No. VIII.

The town of Guildford is full of interesting examples of architecture. These are certainly not so imposing as at Chester and some few other towns, but they are both picturesque and of a kind likely to be particularly worth study to an architect.

The High-street is a long one, starting from the bridge over the river and mounting a steep hill, and after leaving the bottom is for a long distance broken only by very few streets. Doorways in the line of frontage admit to little narrow courts between the houses.

With a very few exceptions, the houses are all of timber, and probably date from the sixteenth, or early seventeenth, century; they have, however, been mostly refronted at a later date. At first sight this appears to have been done in brick, but a closer examination will show that the apparent brickwork is more often a coat of what is called locally "mathematical" tiling fastened over the old timber front. The high fronts also often cover low old roofs behind. The individual houses were originally of large size, and are now for the most part cut up into two or three separate shops. The shop-fronts are, as might be expected, generally modern; and the most interesting feature is the large

\* A critical article on the competitive designs for this building appeared in the *Builder* on November 10 last.



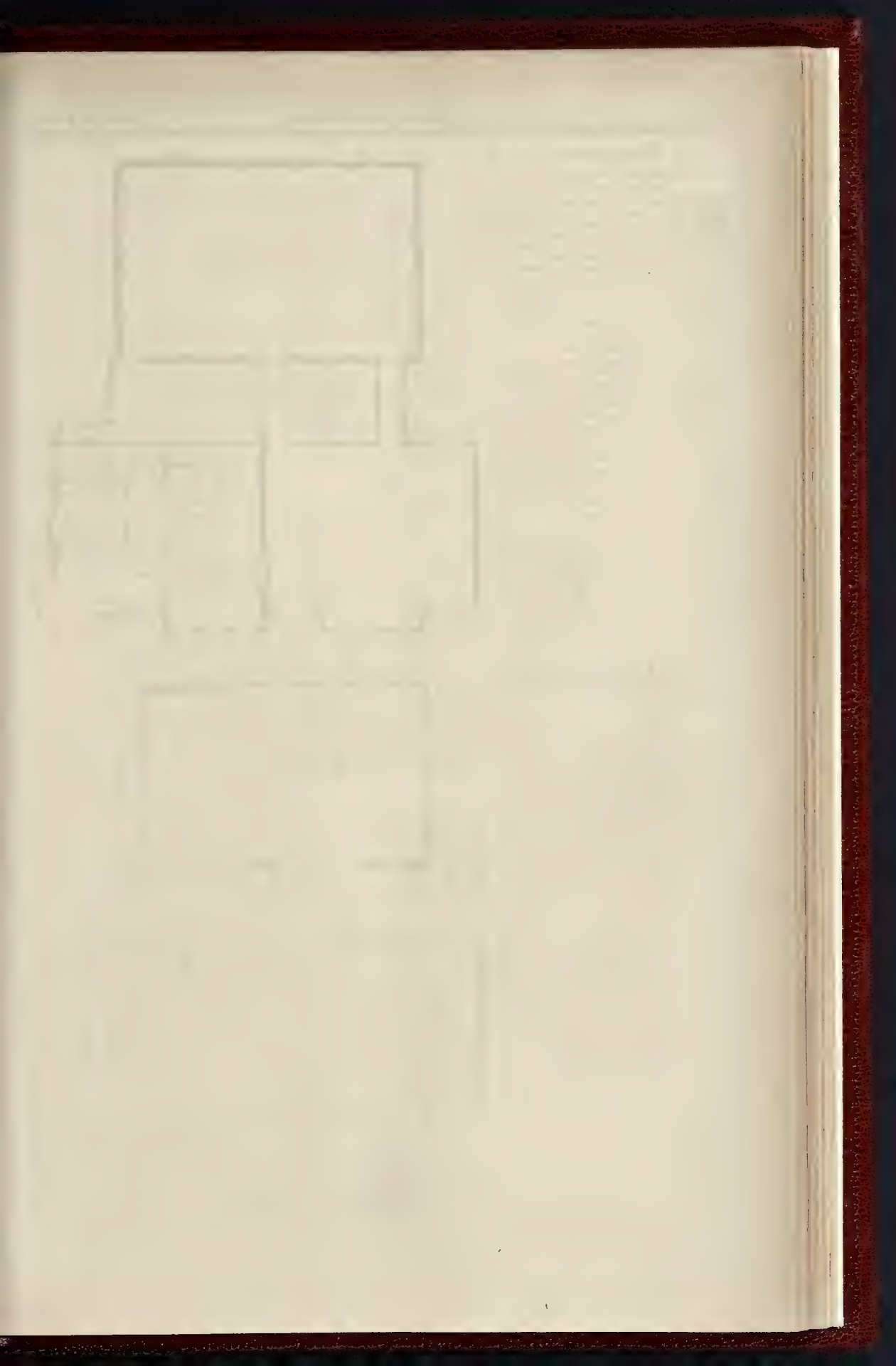
FIRST-FLOOR PLAN.



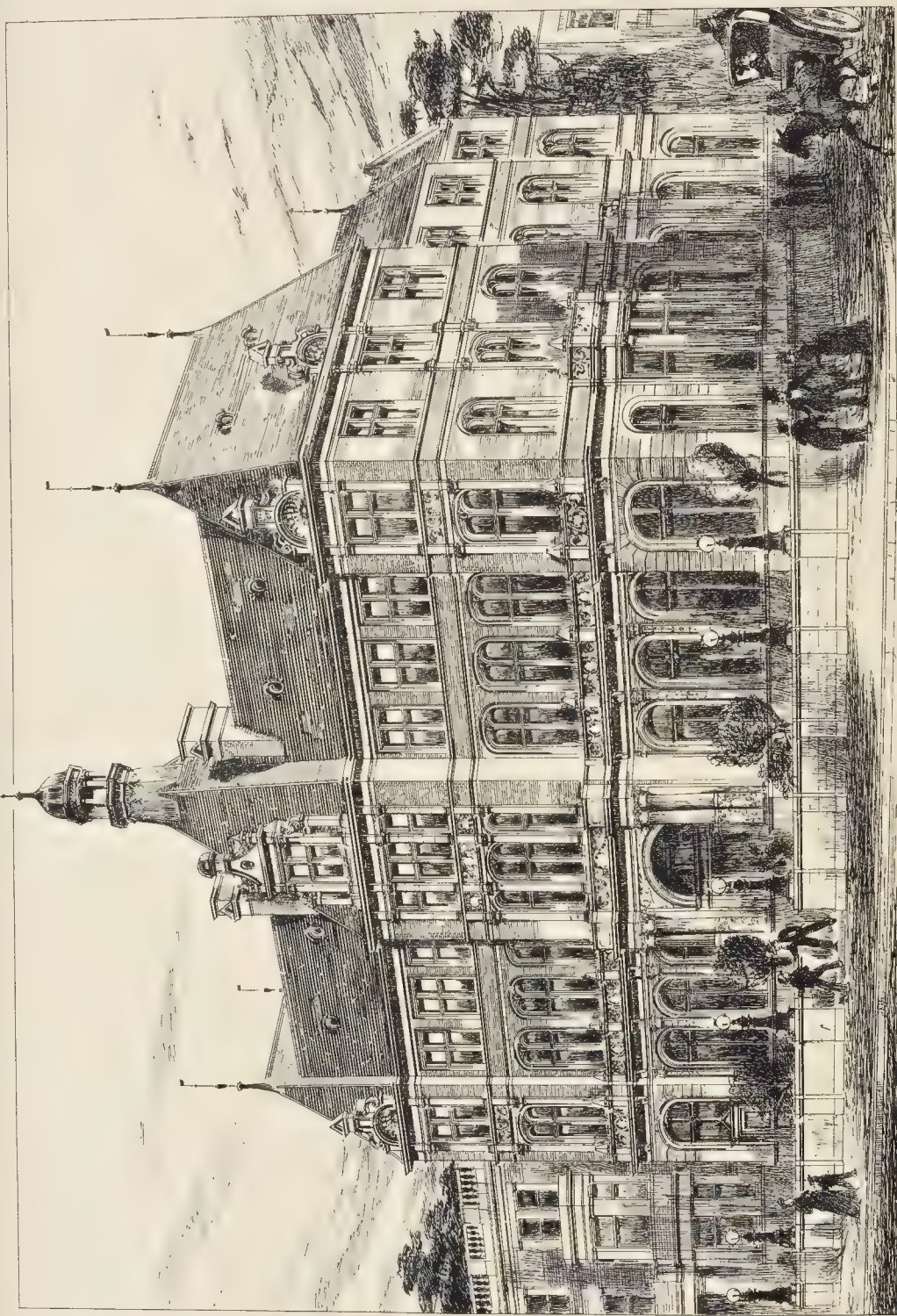
GROUND PLAN.

Battersea Free Library: Selected Design Mr. E. W. Mountford, Architect.



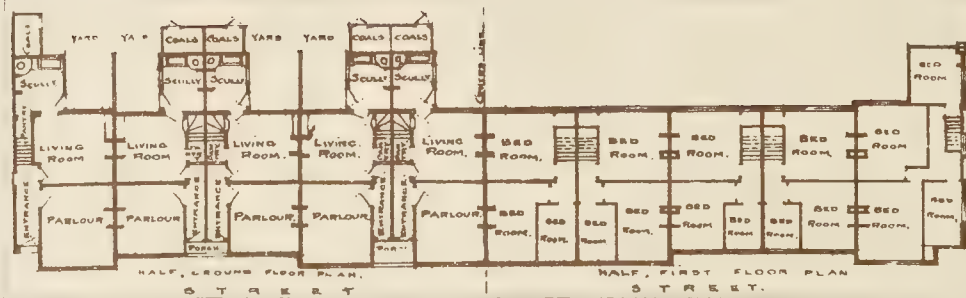


THE BUILDER, DECEMBER 6, 1888.









COTTAGES ERECTED AT LEICEST



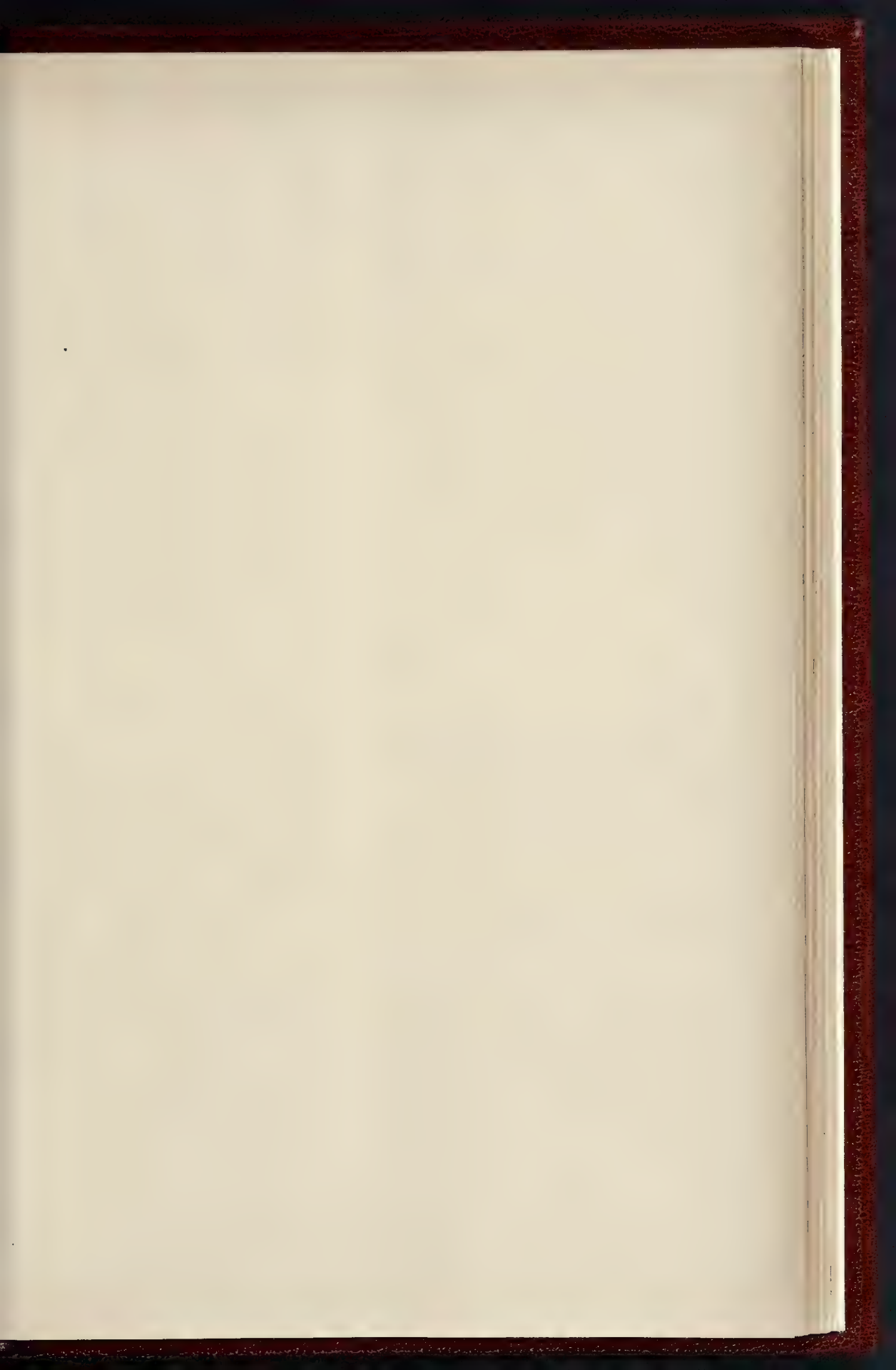


SAAC BARRADALE, F.R.I.B.A., ARCHITECT.

THE PHOTO ABOVE IS A 1/2 MATH 11, 1941 (A54 11 11) 11 11

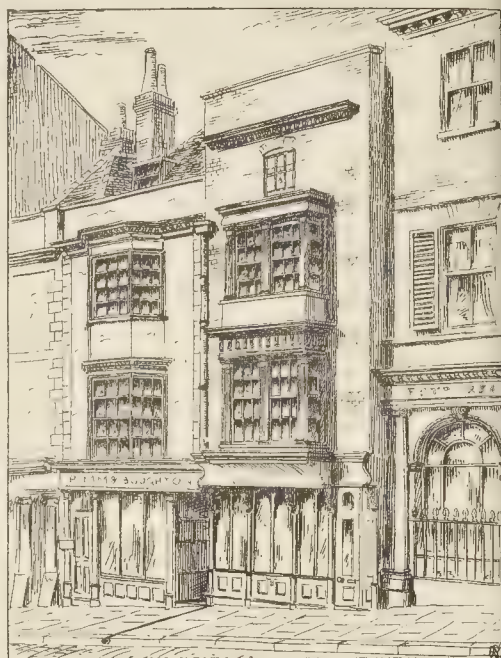




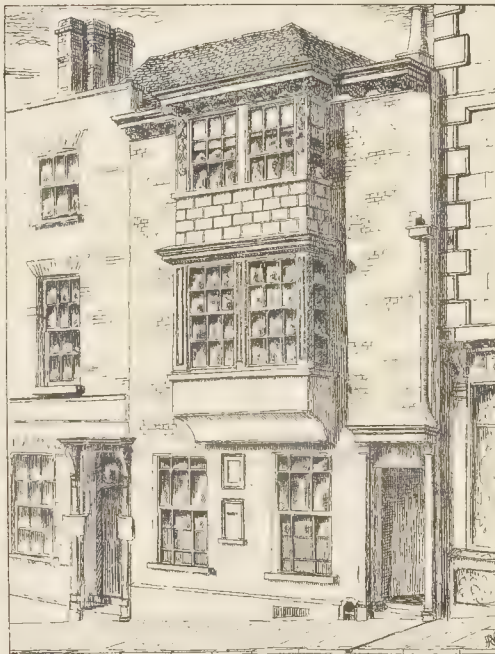




18 HIGH ST GUILDFORD



30 & 31 H.GH. ST



48 HIGH ST. GUILDFORD



56 & 57 HIGH ST





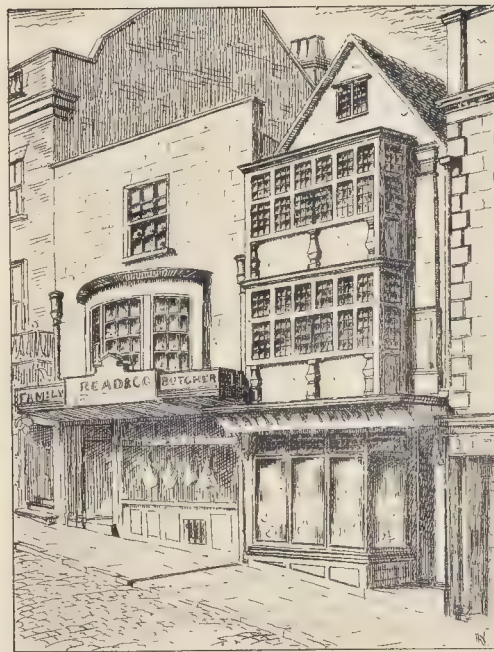
140 & 141 HIGH ST, GUILDFORD



133 & 34 HIGH ST



125 HIGH ST GUILDFORD



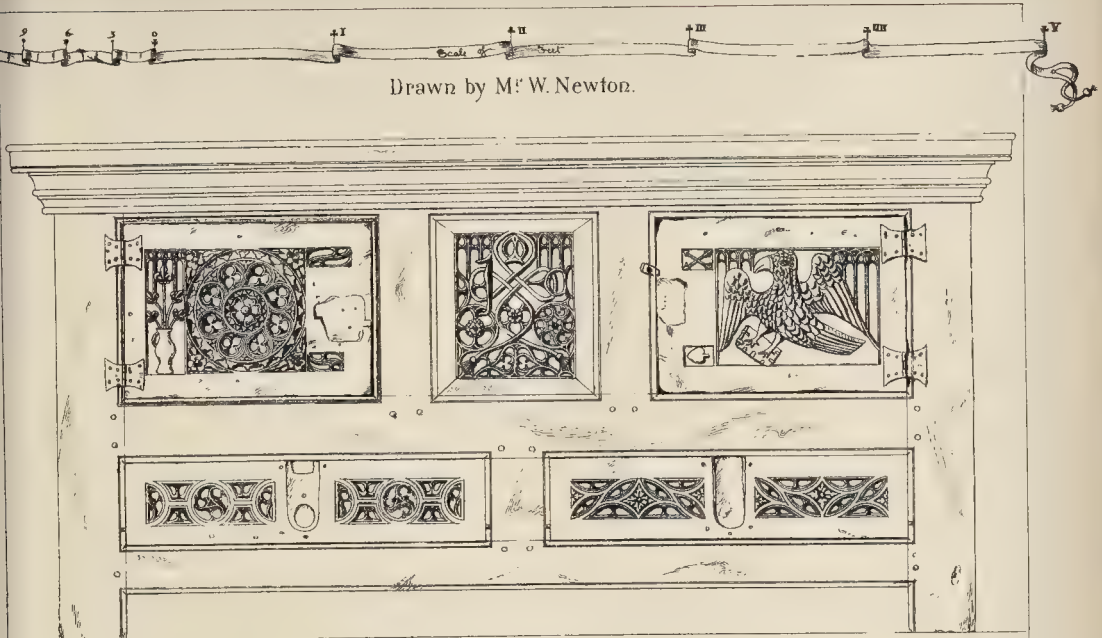
121 HIGH ST

PHOTOGRAPH BY MR. R. C. MARTIN, AND SKETCHES BY MR. R. C. MARTIN.





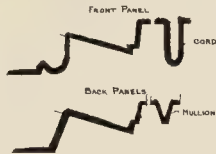
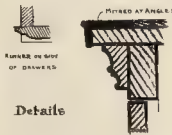
Drawn by Mr. W. Newton.



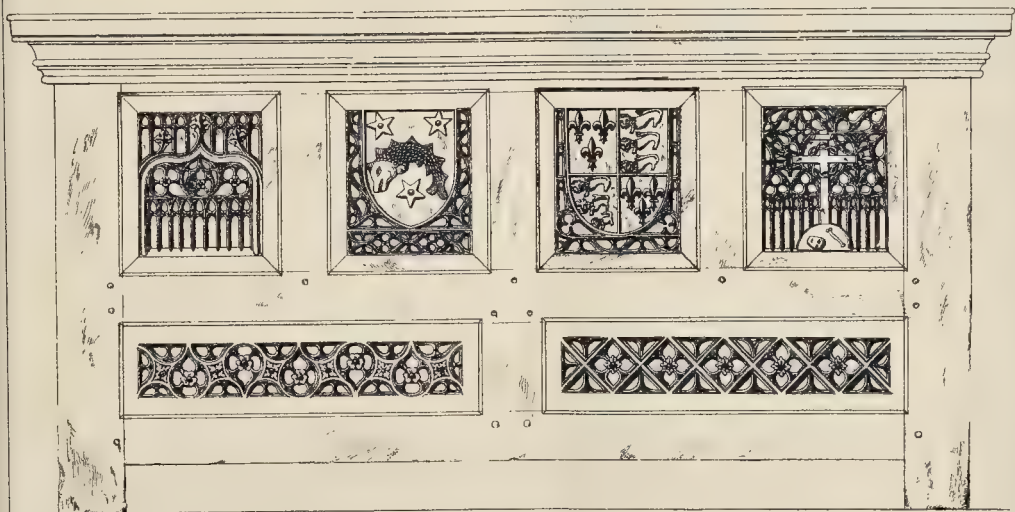
Front Elevation



Details



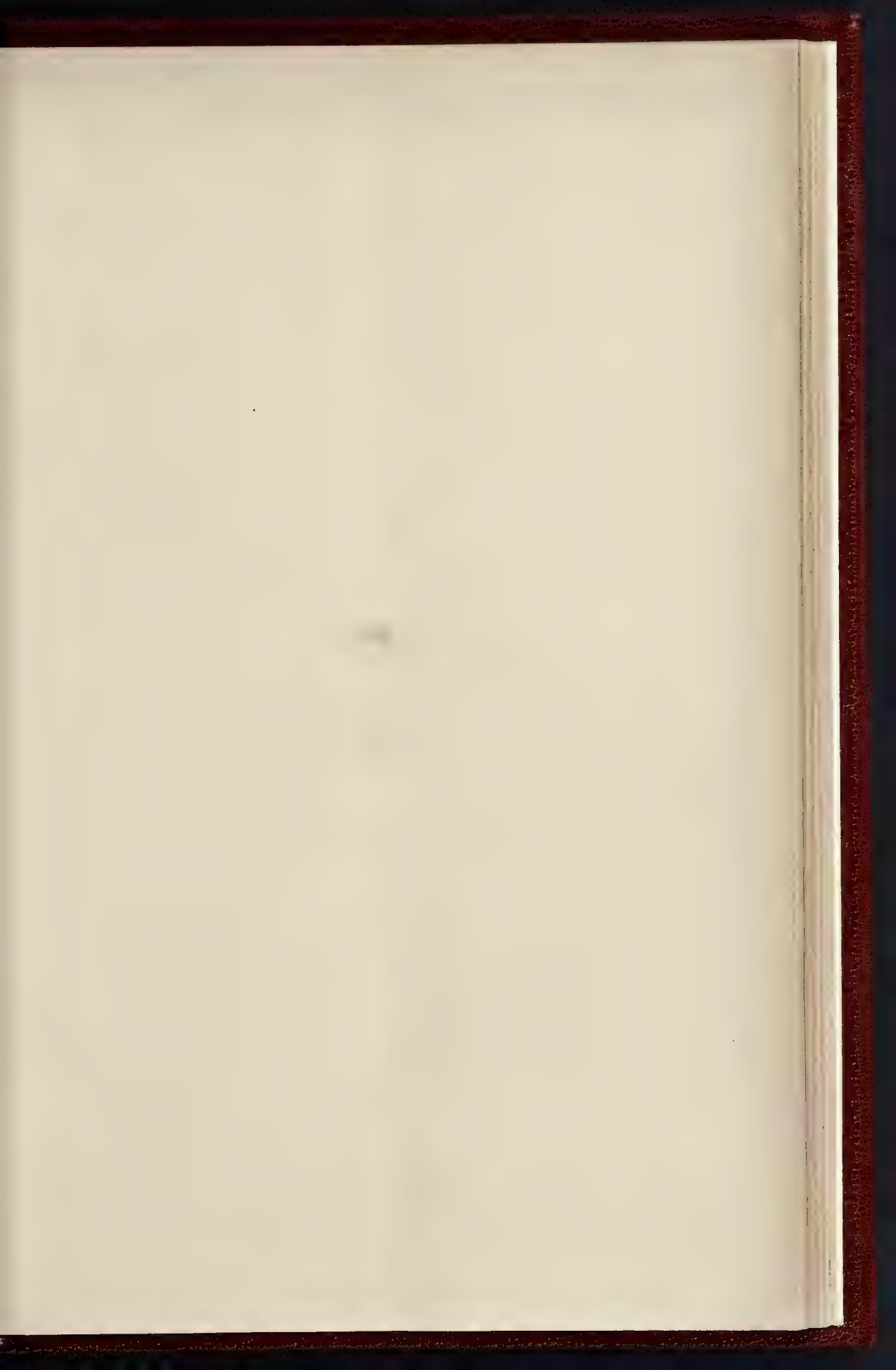
END BACK PANEL



Back Elevation.









BATTERSEA PUBLIC LIBRARY, LAVENDER HILL, S.W. : F.

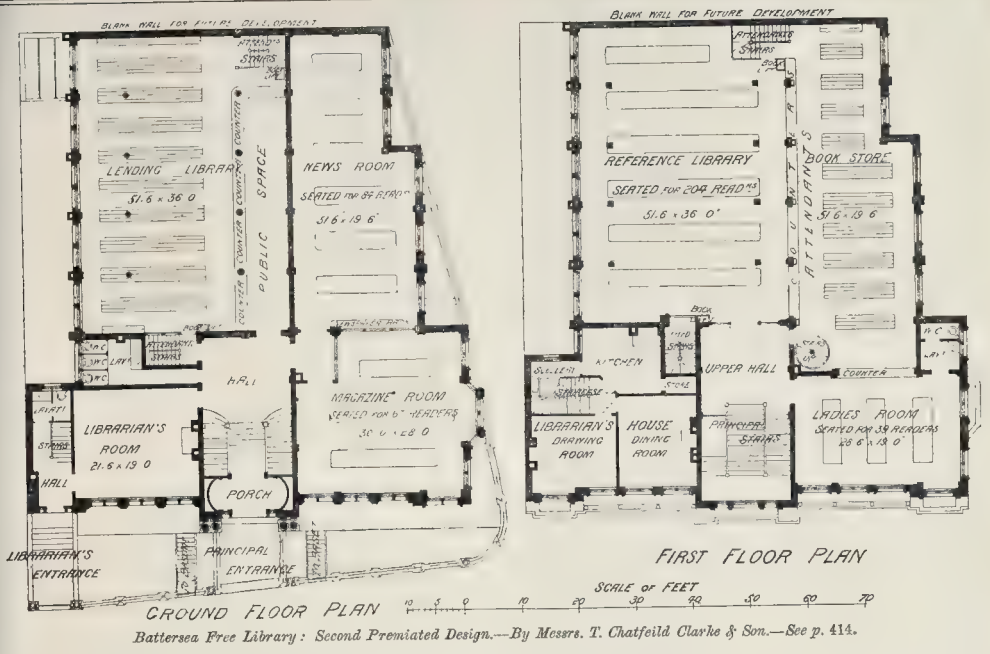




PHOTO LITHO. HARRAGE & 3, 22, MARTIN LANE, LONDON, E.C.







Battersea Free Library: Second Premiated Design.—By Messrs. T. Chatfield Clarke & Son.—See p. 414.

number of bow-windows, of varying design, from the seventeenth century down to comparatively modern times. A cursory glance might content one to set these down merely as picturesque, but a closer inspection will show that for delicacy of detail and accuracy of proportion they are worthy of close study, and, perhaps, are, as such, likely to be more generally useful to the architect than the more imposing and earlier timber buildings.

Although these houses may hardly seem to come under the heading of cottage architecture, it is necessary to include them in my series, in order to make complete the domestic architectural history of the district I have chosen; and, though many of those I now illustrate are later in date than I have hitherto illustrated, I am sure they will carry their own justification with them.

Of earlier architecture, Guildford possesses a splendid example in the Abbott's Hospital, a brick building, founded by Archbishop Abbott in the reign of James I. Besides a general propriety of design, this building has the advantage of having been very little tampered with, and possesses a series of splendid oak doors, and a very fine staircase to the warden's room. There is other interesting detail in various rooms, including the old tables and benches in the common room. This building has been for some years on the list of those suggested by the Royal Institute of British Architects as suitable for its Silver Medal Competition, and I wonder that its proximity to London has not yet induced some one to select it. The Town-hall is also an interesting timber building, well-known from numerous illustrations that have appeared. In the Council-chamber upstairs is an excellent stone mantelpiece, delicately carved with figure subjects brought from Stoughton Manor at the time of its demolition.

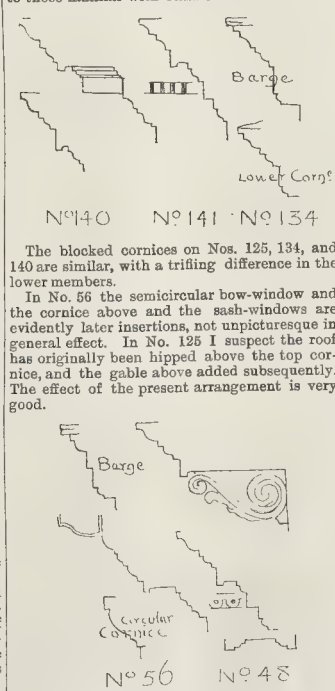
I do not know of much remaining inside the houses, except in that tenanted by Mr. Bull. It is probable that quantities of panelling and carved work may be concealed behind battening. A few years ago I purchased a room of good panelling with a carved Jacobean mantelpiece, which is now at Ote Hall, a house I have before alluded to. The house it came from is now pulled down.

My illustrations give, perhaps, the pick of the examples in the High-street, but there are a number of other bow-windows of excellent design.

It will be seen that there are two principal varieties—those in which the windows are casements with mullions and transoms, and those of later date with sash-windows and regular

Classic detail. The mullioned windows have Classic cornices, and are such as Inigo Jones himself might have designed.

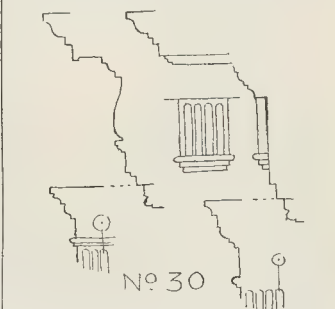
I regret I cannot give measurements of the details, but the sketched profiles will give a key to those familiar with Classic detail.



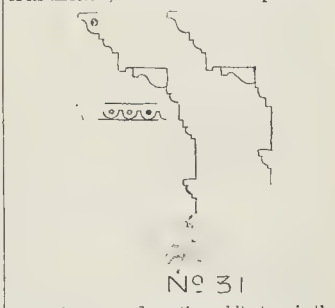
Probably of genuine Queen Anne date is No. 48; there are other varieties of this window, but without the carving.

Nos. 80 and 31 are of somewhat later date, and good examples of Classic work. In these and some of the other windows the detail is very elegant, as is usually the case when Classic

details are carried out on a sufficiently small scale; it is only in cases of exaggerated size, as at the Corn Exchange, of which a corner is shown in one sketch, that the effect is tedious and wearisome. Looking at such examples as these, it is easy to see how the Classic style obtained its hold on the building world. It



may be said, indeed, that the whole of one trade,—that of the joiner,—almost hangs on this style, which probably called him into an existence separate from the carpenter. I have always thought that one reason that the Gothic revival, in spite of the enthusiasm and talent of its directors, has failed to make a permanent



impression on our domestic architecture is the unsuitability of the style of its woodwork to the trade of the joiner, especially since machinery has come so largely to his aid. Of later

date still than the other examples are Nos. 18, 142, and 58



Adjoining No. 30, at No. 29, is one of the most elegant ground-floor fronts of which I know, which must, I think, be at least fifty years earlier than 1834, the date of the establishment of the private bank, now taken over by the Capital and Counties Bank.

It is a satisfaction to think that Guildford people seem wise enough to be proud of the appearance of their High-street, and are not anxious to put vulgar and pretentious new buildings in place of the old, that lend such distinction to their town.

In both Guildford and Godalming there evidently existed an excellent school of joinery, as is witnessed by the character of the doors, mantelpieces, &c., and I wish one could feel that there were a chance of those concerned in the building trades devoting themselves to a diligent study of the storehouse of good work at their doors, and recovering the old traditions, rudely interrupted at the beginning of this century. The most diligent and successful of architects can have but little influence on building generally unless the trade can be awakened to a more intelligent interest in its work.



Local Schools of Art could have no more useful function than in promoting the close and systematic study of local art as shown in the old buildings of the neighbourhood. R. N.

**Ascott House, Leighton Buzzard.**—With reference to the illustration of this house, published in our last, Mr. H. Devey Browne writes to say that the additions to the house were designed by his late uncle, Mr. George Devey, and not by Messrs. Williams, West, & Slade, who, according to our correspondent, have merely carried out the works since Mr. Devey's death.

**Phenomena of Thunderstorms.**—At the first monthly meeting of the Royal Meteorological Society for the present session, Dr. W. Marret, F.R.S., President, in the chair, Mr. G. J. Symons, F.R.S., read a paper on "Results of an Investigation of the Phenomena of English Thunderstorms during the years 1857-59." This paper was written nearly thirty years ago, but it has now been communicated to the Society at the request of the Thunderstorm Committee. The paper contains a summary, chiefly in statistical form, of some of the results of an investigation into English thunderstorms, and the accidents produced by lightning during the years 1857-9. The author found that in sheet-lightning the most prevalent colour is white, then yellow, blue, and red; in forked lightning the order is nearly reversed, blue being more than twice as frequent as any other colour, then red, white, and most rarely yellow. Sheet lightning was seen about twice as often as forked.

## THE CULTIVATION OF THE SENSE OF BEAUTY.

THE above title expresses what was the main purport of the latter portion of Sir F. Leighton's opening address at the Liverpool Art Congress, which was as follows:—

"I said that the sense of abstract beauty with the mass of our countrymen—and once again I must be understood not to ignore, but only to leave out of view for the moment, the considerable and growing number of those in whom this sense is astir and active—with the mass, I repeat, of our countrymen, the perception of beauty is blunt, and the desire for it sluggish and superficial; with them the beautiful is, indeed, sometimes a source of vague, half-conscious satisfaction, especially when it appeals to them conjointly with other incitements to emotion, but their perception of it is passive, and does not pass into active desire; it accepts, it does not demand; it is uncertain of itself, for it lacks definiteness of intuition, and, having no definite intuition, it is necessarily uncritical. This weakness, among the many, of the critical faculty in æsthetic matters, and the curious bluntness of their perceptions, is seen not in connexion with the plastic arts only, but over the whole artistic field—in the domains of music and the drama, as in that of painting and sculpture. Who, for instance, where a body of English men and women has been gathered together in a concert-room, has not, at one moment heard a storm of applause go up to greet some matchless executant of noble music, and then, five minutes later, watched in wonder and dismay the same creptation of eager hands proclaiming an equal satisfaction with the efforts of some feeblest servant of Apollo? Or have you not often, in your theatres, blushed to see the lowest buffoonery received with exuberant delight by an audience,—and a cultivated audience,—which had just before not seemed insensible to some fine piece of histrionic art? And what could proclaim the lack of true, spontaneous instinct in more startling fashion than the notorious fact that the most thrilling touch of pathos in the performance of an actor reputed to be comic will be infallibly received with a titter by a British audience, which has paid to laugh and come to the play focussed for the funny? Now this little glimpse into the attitude of the public in regard to other arts than ours has its bearing upon our present subject. This same feebleness of the critical sense which arises out of the indefiniteness,—to say the best of it,—of the inner standard of artistic excellence, is not unnaturally accompanied by and fosters an apathy in regard to that excellence, and an attitude of callous acquiescence in the unsightly, which are inexpressibly mischievous; for you cannot too strongly print this on your minds, that what you demand, that you will get, and according to what you accept will be that which is provided for you. Let an atmosphere be generated among you in which the appetite for what is beautiful and noble is whetted and becomes imperative, in which whatever is ugly and vulgar shall be repugnant and hateful to the beholder, and assuredly what is beautiful and noble will, in due time, be furnished to you, and in steadily increasing excellence, satisfying your taste, and at the same time further purifying it and heightening its sensitiveness. The enemy, then, is this indifference in the presence of the ugly; it is only by the victory over this apathy that you can rise to better things; it is only by the rooting out and extermination of what is ugly that you can bring about conditions in which beauty shall be a power among you. Now, this callous tolerance of the unsightly, although it is, I am grateful to think, yielding by degrees to a healthier feeling, is still strangely prevalent and widespread among us, and its deadening influence is seen in the too frequent absence of any articulate protest of public opinion against the disfigurement of our towns. Let me give you an instance of this indifference. Our country is happy in possessing a collection of paintings by the Old Masters of exceptional interest and splendour, a collection which, thanks to the taste and highly-trained discernment of its present accomplished head—Sir Frederick Burton—is, with what speed the short-sighted policy of successive Governments permits, rising steadily to a foremost place among the famous galleries of the world. Some years ago the building destined to receive it being found no longer adequate, it became necessary to provide by some means ampler space for the display of the national treasure. It was resolved that another edifice should take the place of that designed by Wilkins, an edifice which, be it said in passing, had been made the butt of curiously unmerited ridicule in the world of connoisseurship, and which, apart from certain very obvious blemishes, it has always seemed to me to be much easier to deride than to better. A competition was opened, and designs were demanded for a spacious building, equal to present and future needs, and worthy of the magnificence of the collection it was to house. It is hardly necessary to say that we have here no concern whatever with the controversy which arose over these designs. My concern is with its final outcome, which is this: the original building has remained unaltered as to its exterior; but on the rear of one of its flanks loom now into view, first an appendage in an entirely different style of architecture, and, further on, an excrescence of no style of architecture at all, the one an Italian tower, the other a flat cone of glass, surmounted by a ventilator—a structure of the warehouse type—the whole resulting in a jarring jumble and an aspect of chaotic incongruity which would be ludicrous if it were not distressing; and we enjoy, further, this instructive phenomenon—that a public opinion which sensitively shrank from the blemishes of the original edifice has accepted its retention, with all those blemishes unmodified, plus an appendage which adds to the whole the worst, almost, of all sins architectural—a lack of unity of conception. Now, I have never to my knowledge heard one single word of articulate public reprobation levelled at this now irremediable blot on what we so complacently call the finest site in the world; and yet I cannot find it in me to believe that many have not, like myself, groaned in spirit before a spectacle so deplorable—a spectacle which, indeed, is only conceivable within these islands. I think that a good deal is summed up in this episode, and I need not, for my present purpose, seek another in the domain of architecture. In regard to sculpture, the public apathy and blindness are yet more depressing and complete, and illustrate the deadness of the many to the perception of the essential qualities of art. To the overwhelming majority of Englishmen sculpture means, simply, the perpetuation of the form of Mr. So-and-So in marble, bronze, or terra-cotta,—this, and no more. That marble, bronze, or terra-cotta may, under cunning hands, become vehicles, for those who have eyes to see, of emotions, æsthetic and poetic, not less lofty than those which are stirred in us by the verse of a Dante or a Milton, or by the strains of noblest music,—of this, the consciousness is for practical purposes non-existent. For sculpture, for an art through which, alone, the name of Greece would have been famous for all time, there is, outside portraiture, even now, under conditions admittedly improved, little or no field in our country. Portrait-statues, galore, bristle, indeed, within our streets; but the notion of setting up in public places pieces of monumental sculpture solely for adornment and dignity, or of monuments that shall remind us of deeds in which our country or our town has earned fame and deserved gratitude, and incite the young to emulation of those deeds, or that shall be the allegorised expression of any great idea,—and yet our race has had great ideas, and clothed them in deeds as great,—hardly ever, it would seem, enters the heads of a people whose aspirations are surely not less noble or less high than those of other nations. Nay, even a monument commemorative of the great public services of some individual man which shall be a monument to him rather than exclusively an image of him, a monument, of which his effigy shall form a part, but of which the main feature shall be the embodiment or illustration, in forms of art, of the virtues that have earned for him the homage of his countrymen,—even this is suggested in vain. And if we are tolerant of treason against fitness in architecture, what shall we say of our tolerance in regard to its sculptural adornments? What shall we say of the complaisant acceptance, above and about windows and doorways in clubs, offices, barracks, and the like buildings, of carved wonders such as no civilised community would accept in silence? Though I fear I must here, with all deference, add that my brethren, the architects, who suffer their work to be so defaced, are themselves not wholly blameless; and, indeed, it is a truth, in the assertion of which the most enlightened workmen in every branch of art will stand by me, that among ourselves also the sense of the kinship of the arts is too often a mere theory,



received, no doubt, with respect as an abstract proposition, but not perceptibly colouring our practical activity. In sculpture the inertness of demand and tolerance of inferior supply is due mainly to the want, to which I have alluded, of a sense of and a joy in the purely æsthetic quality in artistic production, an insensibility to the power inherent in form, by its own virtue, of producing emotion and exciting the imagination,—a power on which the dignity of this pure and severe art does or should mainly rest. In the appreciation of painting, which, on various grounds, appeals as an art to a far wider public than either architecture or sculpture, the same shortcomings are evident, though in a less degree, and with less mischievous results; for the witchery of colour, at least, is felt and appreciated, more or less consciously, by a very large number of people. The inadequacy of the general standard of artistic insight is here seen in the fact that, to a great multitude of persons, the attractiveness of a painted canvas is in proportion to the amount of literary element which it carries, not in proportion to the degree of æsthetic emotion stirred by it, or of appeal to the imagination contained in it,—persons, those, who regard a picture as a compound of anecdote and mechanism, and with whom looking at it would seem to mean only another form of reading. Time after time, in listening to the description, the enthusiastic description, of a picture, we become aware that the points emphasised by the speaker are such as did not specially call for treatment in art, that its want—the lack of a perception that certain qualities are the very essence of art, and link into one great family every work of the hands of men in which they are found, has led with us to a disastrous divorce between what is considered as art proper and the arts which are called industrial. I say advisedly 'disastrous,' for the lowering among us in the present day of the status of forms of art in the service of which such men as Albert Dürer, for example, and Holbein (men, by the bye, of kindred blood with ourselves), Cellini, and Lionardo, were glad to labour and create,—and that not as a concession, but in the joyful exercise of their fullest powers,—is one of its results, and carrying with it, as is natural, a lowering of standard in these arts, has generated the marvellous notion, not expressed in words, but too largely acted on, that art in any serious sense is not to be looked for at all in certain places,—where, in truth, alas! neither is it often found,—and led to the holding aloof to a great extent, until comparatively recent years, of much of the best talent from very delightful forms of artistic creation, and this notion has led further to the virtual banishment from certain provinces of designing of the human figure, or, where it is not banished, to its deprecation, too often, in the hands of the untrained or the inept. We are to a wonderful degree creatures of habit, our thoughts are prone to run,—or shall I not rather say to stagnate?—within grooves; and, if we are a people of many and of great endowments, a swift and free play of thought is, as we have been forcibly told by a voice that we shall hear no more,—and can ill miss,—not a distinguishing feature among us. Is it not an amazing thing, for example, that human shapes, which in clay or plaster would be ignominiously excluded from a second-rate exhibition, are not only accepted, but displayed with a chuckle of elated pride, when cast in the precious metals, flanked, say, by a palm-tree, borne aloft on a rook, and presented in the guise of a piece of ornamental plate? But is this even rare? Is it not of constant occurrence? Do you demur? Well, let me ask you a plain question: Of all the nymphs and goddesses, the Satyrs and the Tritons, that disport themselves on the ceremonial goldsmithery of the United Kingdom, how many if cast in vulgar plaster and not in glittering gold would pass muster before the jury of an average exhibition? and if few, I ask why is this so? In the name of Cellini—nay, in the name of common sense, why? and is it on account of the low ebb of figure modelling for decorative purposes that on our carved furniture,—what we mysteriously describe as "art furniture"—the human form is hardly ever seen? Then why is the best talent not enlisted in this work? Certain it is that the absence of living forms imports to much of the furniture now made in England, unsurpassed as it is in regard to delicacy and finish of handiwork, and frequently elegant in design, a certain look of slightness and flimsy, faddy dilettantism which prevents it from taking that rank in the province of applied art to which it might and should aspire. But I have, I fear, already un-

duly drawn upon your patience, and I must bring to a close these too disjointed prefatory words, leaving it to the accomplished gentlemen who head the various sections of this Congress to amplify and enrich as they will, out of the wide fund of their knowledge and experience, the bald outline I have sketched before you. They, in their turn, taking up, no doubt, our common parable, will emphasise and press on you the fact that by cultivating its æsthetic sense in a more comprehensive and harmoniously consistent spirit than hitherto, and with a clearer vision of the nature of all art and a more catholic receptiveness as to its charms, and by stimulating in a right direction the abundant productive energy which lies to its hand, this nation will not only be adding infinitely to the adornment and dignity of its public and private life, not only providing for itself an increasing and manifold source of delight and renovating repose, mental and spiritual, in a day in which such resting and regenerating elements are more and more called for by our jaded nervous systems, and more and more needed for our intellectual equilibrium, but will be dealing with a subject which is every day becoming more important in relation to certain sides of the waning material prosperity of the country. For, as they will no doubt remind you, the industrial competition between this and other countries,—a competition keen and eager, which means to certain industries almost a race for life,—runs, in many cases, no longer exclusively or mainly on the lines of excellence of material and solidity of workmanship, but greatly nowadays on the lines of artistic charm and beauty of design. This, to you, vital fact is one which they will, I am convinced, not suffer to fall into the background. One last word in anticipation of certain objections not unlikely to be raised against an assumption which may seem to be implied in the existence of our Association,—the assumption that the evils and shortcomings of which I have spoken with such unsparring frankness can be removed or remedied by the gathering together of a number of persons to listen to a series of addresses. The causes of these evils, we may be told, and their antidote, are not on the surface of things, but rest on conditions of a complex character, and are fundamental. 'Who,' I hear some one say, 'is this dreamer of dreams, who hopes to cure by talking such deep-seated evils? Who is this shallow and unphilosophical thinker who does not see that the same primary conditions are operative in making the purchaser indifferent to what he gets and the supplier indifferent to what he produces, and who attributes the circumstance that good work is not generally produced in certain forms of industry to the lack of demand, rather than to the deep-lying fact that suppliers and demanders are of the same stock, having the same congenital failings, and satisfied with the same standards?' My answer to this imaginary, or, I ought, perhaps, to say this foreseen, objector would be, firstly, this,—that I am not the visionary for whom he takes me, and that I do not believe in the efficacy of words either directly to remedy the state of things I have been deploring, or to create a love of art and a delicate sensitiveness to its charms in those to whom the responsive chords have been refused; neither is the eloquence trumpet-tuned and triumphant, conceivable by me before which the walls of the Jericho of the Philistines shall crumble in abrupt ruin to the ground, least of all do I believe in sudden developments of the human intellect. But it has, nevertheless, seemed to me, as it has seemed to the framers of this Association, that words, if they be judicious and sincere, may rally and strengthen and prompt to action instincts and impulses which only await a signal to assert themselves,—instincts sometimes, perhaps, not fully conscious of themselves,—and that a favouring temperature may be thus created within which, by the operation of natural laws, in due time, but by no stroke of the wand, a new and better order may arise. Neither, indeed, do I ignore the force of my critic's contention that the causes of mischief lie deep, and are not to be touched by surface tinkering, if they are to be removed at all; though I demur to his pessimistic estimate of them as a final bar to our hopes. It is true that certain specific artistic attributes are, or seem to be, feeble in our race; it is true, too true, that the general standard of taste is low; it is true, too true—I have it on the repeated assurance of apologetic vendors,—that with us the ugliest objects—often, oh! how ugly—have

received, no doubt, with respect as an abstract proposition, but not perceptibly colouring our practical activity. In sculpture the inertness of demand and tolerance of inferior supply is due mainly to the want, to which I have alluded, of a sense of and a joy in the purely æsthetic quality in artistic production, an insensibility to the power inherent in form, by its own virtue, of producing emotion and exciting the imagination,—a power on which the dignity of this pure and severe art does or should mainly rest. In the appreciation of painting, which, on various grounds, appeals as an art to a far wider public than either architecture or sculpture, the same shortcomings are evident, though in a less degree, and with less mischievous results; for the witchery of colour, at least, is felt and appreciated, more or less consciously, by a very large number of people. The inadequacy of the general standard of artistic insight is here seen in the fact that, to a great multitude of persons, the attractiveness of a painted canvas is in proportion to the amount of literary element which it carries, not in proportion to the degree of æsthetic emotion stirred by it, or of appeal to the imagination contained in it,—persons, those, who regard a picture as a compound of anecdote and mechanism, and with whom looking at it would seem to mean only another form of reading. Time after time, in listening to the description, the enthusiastic description, of a picture, we become aware that the points emphasised by the speaker are such as did not specially call for treatment in art, that its want—the lack of a perception that certain qualities are the very essence of art, and link into one great family every work of the hands of men in which they are found, has led with us to a disastrous divorce between what is considered as art proper and the arts which are called industrial. I say advisedly 'disastrous,' for the lowering among us in the present day of the status of forms of art in the service of which such men as Albert Dürer, for example, and Holbein (men, by the bye, of kindred blood with ourselves), Cellini, and Lionardo, were glad to labour and create,—and that not as a concession, but in the joyful exercise of their fullest powers,—is one of its results, and carrying with it, as is natural, a lowering of standard in these arts, has generated the marvellous notion, not expressed in words, but too largely acted on, that art in any serious sense is not to be looked for at all in certain places,—where, in truth, alas! neither is it often found,—and led to the holding aloof to a great extent, until comparatively recent years, of much of the best talent from very delightful forms of artistic creation, and this notion has led further to the virtual banishment from certain provinces of designing of the human figure, or, where it is not banished, to its deprecation, too often, in the hands of the untrained or the inept. We are to a wonderful degree creatures of habit, our thoughts are prone to run,—or shall I not rather say to stagnate?—within grooves; and, if we are a people of many and of great endowments, a swift and free play of thought is, as we have been forcibly told by a voice that we shall hear no more,—and can ill miss,—not a distinguishing feature among us. Is it not an amazing thing, for example, that human shapes, which in clay or plaster would be ignominiously excluded from a second-rate exhibition, are not only accepted, but displayed with a chuckle of elated pride, when cast in the precious metals, flanked, say, by a palm-tree, borne aloft on a rook, and presented in the guise of a piece of ornamental plate? But is this even rare? Is it not of constant occurrence? Do you demur? Well, let me ask you a plain question: Of all the nymphs and goddesses, the Satyrs and the Tritons, that disport themselves on the ceremonial goldsmithery of the United Kingdom, how many if cast in vulgar plaster and not in glittering gold would pass muster before the jury of an average exhibition? and if few, I ask why is this so? In the name of Cellini—nay, in the name of common sense, why? and is it on account of the low ebb of figure modelling for decorative purposes that on our carved furniture,—what we mysteriously describe as "art furniture"—the human form is hardly ever seen? Then why is the best talent not enlisted in this work? Certain it is that the absence of living forms imports to much of the furniture now made in England, unsurpassed as it is in regard to delicacy and finish of handiwork, and frequently elegant in design, a certain look of slightness and flimsy, faddy dilettantism which prevents it from taking that rank in the province of applied art to which it might and should aspire. But I have, I fear, already un-



the largest market; nevertheless, the amount of good artistic production in connexion with industry—I purposely speak of this first—has grown within the last score or so of years, and through the initiative, mind, of a mere handful of enthusiastic and highly-gifted men, in an extraordinary degree; and in a proportionate degree has the number increased, also, of those who accept and desire it; and this growth has been steady and organic, and is of the best augury. Now, the increase in the number of those who desire good work, and the concurrent development of their critical sensitiveness in matters of taste, stimulate, in their turn, the energies, and sustain the upward efforts, of the producers, and thus, through action and reaction, a condition of things should be slowly but surely evolved which shall more nearly approach that general level of artistic culture and artistic production so anxiously looked for by us all. It is in the hastening of this desired result that we invoke, not your sympathy alone, but your patient, strenuous aid. And if I am further asked how, in my view, this association can best contribute to the furtherance of our common end, I would say, not merely by seeking to fan and kindle a more general interest in the things of art, but mainly by seeking to awaken a clearer perception of the true essence of a work of art, by insisting on the fundamental identity of all manifestations of the artistic creative impulse, through whatever channels it may express itself, and by setting forth and establishing this pregnant truth—that whatever degrees of dignity and rank may exist in the scale of artistic productions, according to the order of emotion to which they minister in us, they are one in kind; for the various and many channels through which beauty is made manifest to us in art are but the numerous several steps of one and the same divine instrument. And if in what I have said I have laid especial stress on that branch of art which is called industrial, it is not solely to develop this cardinal doctrine, neither only because of the pressing, practical, paramount national importance of this part of our subject, but also because I, in truth, believe that it is in a great measure through these very forms of art that the improvement, to which I look with a steadfast faith, will be mainly operated. The almost unlimited area which they cover in itself constitutes them an engine of immense power, and I believe that through them, if at all, the sense of beauty and the love for it will be stimulated in, and communicated to, constantly increasing numbers. I believe that the day may come when public opinion, thus slowly but definitely moulded, will make itself loudly heard; when men will insist that what they do for the gracing and adornment of their homes shall be done also for the public buildings and thoroughfares of their cities; when they will remind their municipal representatives and the controllers of their guilds of what similar bodies of men did for the cities of Italy in the days of their proud prosperity in trade, and will ask why the walls of our public edifices are blank and silent, instead of being adorned and made delightful with things beautiful to see, or eloquent of whatever great deeds or good work enrich and honour the annals of the places of our birth. And, lastly, I believe that an art desired by the whole people and fostered by the whole people's desire would reflect,—for such art must be sincere,—some of the best qualities of our race: its love of Nature, its imaginative force, its healthfulness, its strong simplicity."

#### THE ARCHITECTURAL ASSOCIATION: IRISH ARCHITECTURE.

THE fourth meeting of this Association for the present session was held on the 30th ult., at 9, Conduit-street, Mr. Herbert D. Appleton (President) in the chair.

The following new members were elected, viz.:—Messrs. G. D. Curtis, J. P. Coope, A. C. Breden, T. P. Simpson, S. W. Cranfield, H. T. Cooper, G. H. C. Cole, H. J. Potter, R. Savage, E. J. Wellman, C. F. Devitt, J. L. Williams, W. H. Lucas, W. H. Barton, T. Jenner, S. Gluckstein, J. E. Capell, M. J. Calligan, H. A. Dives, H. C. M. White, N. Vaughan, W. H. Finch, E. B. Wetenhall, J. S. Millbourne, W. Stainer, H. J. Gamble, and C. S. Stone.

The Chairman announced that, with regard to the affiliation of the Birmingham Association and the Glasgow Association, the negotiations were quite completed, and that the matter stood over to the next meeting.

Mr. J. L. Robinson, A.R.H.A., then gave a lecture entitled "The Development of Irish Architecture from the Early Celtic work to the Eighteenth Century."

The lecturer made the following introductory remarks:—

Although the remains of ancient architecture now existing in Ireland are few in number and singularly devoid of detail, yet a great amount of interest attaches to them as records of the condition of the country at different periods of its history.

The sepulchral tumuli which abound are the only evidence which now exists of the Tuatha de Danaans, a race which inhabited Ireland until the invasion of the Milesians about 1000 B.C. Some of these tumuli, which are scattered along the banks of the river Boyne, from Drogheda to Slane, are of large size. The most notable is New Grange, an artificial mound covering a long passage of upright stones, with lintels over, leading to a cruciform chamber, about 30 ft. high. Some of the stones composing the passage, and those at the entrance, are covered with ornament of the simplest character, such as lozenges, zig-zags, and concentric circles. The mound at New Grange is surrounded by a circle of monoliths, placed at equal distances apart. The entire internal arrangement of this tumuli bears some resemblance to the pyramids of Egypt. Cromlechs are also very plentiful, as well as stones with Ogham inscriptions, which consist of notches cut on the edges of the stones.

It is probable that with very few exceptions timber formed the principal material used in the construction of dwellings until a comparatively recent period. The earliest examples of masonry are of a Cyclopean character, the stones used being of large size, closely fitted together, and the doors and windows have sloping jambs and lintels over.

Some of the churches at Glendalough and Clonmacnoise partake of this character.

In the West, rude huts of dry masonry, like beehives, are to be seen, which were used as dwellings by hermits in early Christian times.

In Killiney Church, a small building attributed by Petrie to the sixth century, is an Etruscan door with a Greek cross cut in relief on the soffit of the lintel. There are several examples of stone-roofed churches or houses, the best known being St. Columba's house, at Kells; St. Kevin's house at Glendalough, and Cormac's Chapel at Cashel.

The development from the lintel is easily traced; first, the lintel is scooped out to form an arch over the open, then the arch is formed of three stones, and later on many stones are used. In the same way the earlier doors and windows have square jambs without ornament, then a fillet was worked on the edge, or bead, and by degrees the ornament developed until it culminated in the beautiful and distinctive ornament to be seen at Ardref, Glendalough, Clonmacnoise, Cashel, &c. The great peculiarity of Irish, that is, pre-Norman, architecture is the large use of interlaced ornament, which was carried, at the same time, to such perfection in metal work and in illuminated manuscripts. The same ornament occurs in the doors, &c., of the later round towers, and forms the principal decoration of the crosses.

Some attention has lately been bestowed on the fact that large numbers of crosses, or rather fragments of crosses, covered with interlaced ornament, are to be found in Scotland and the Midland Counties. This is easily accounted for by the fact that, from the sixth to the tenth centuries, when the entire of Europe was overrun by barbarians, Ireland kept alight the lamp of learning and Christianity, and sent her missionaries to all parts of the world, whilst the noblest families of Europe sent their sons to be educated at the renowned colleges of Ireland. Hence the missionaries brought artificers and their art along with them, and their Celtic ornament is to be traced at Iona, Lindisfarne, through England, Normandy, Switzerland, and many other parts of Europe.

The Round Towers are, I may say, peculiar to Ireland, and have given rise to several theories about their origin. Some say they were built by the Phenicians, others by the Danes, or by the Fire-worshippers, or that they were Buddhist temples. Dr. Petrie was the first to show that they were decidedly of Christian origin, by analysing each theory and exposing its weak points and contradictions. He also proved that they are never found unconnected with ancient ecclesiastical foundations; that their architectural styles exhibit no features or peculiarities

not found in the original churches with which they are locally connected, when such remain; that on several of them Christian emblems are observable, and others display in the details a style of architecture universally acknowledged to be of Christian origin; and finally, that they possess, invariably, architectural features not found in any building in Ireland ascertained to be of Pagan times. He then proves that they were used as bellries and watch-towers, and also as places of refuge in times of danger, the doors being placed at such a height from the ground as to favour such a theory, which is supported by the many entries in the Irish annals of forays by the Danes on the churches, and that the clergy took refuge in the Clochkeagh, a round tower. The crosses are also almost peculiar to Ireland. Several of them are covered with figures representing Scripture subjects, the Last Judgment often appearing at the junction of the arms around the crucifixion. The old churches are all of very small size, the cathedral at Glendalough measuring 37.0 x 55 ft. in length. The development of the ornament is easily traced in the different examples which still exist. King Cormac's chapel at Cashel, which was finished in the year 1131, is the latest and most ornate example of the style. All the arches are semi-circular, the piers or pilasters square and covered with ornament, and the roof a barrel vault with ribs dividing each bay. There is no doubt that but for the Anglo-Norman invasion there was every probability of the development of a style of architecture differing in material respects from the rest of Europe.

The architectural result of the Anglo-Norman invasion was that the invaders imported their notions of architectural taste with them, and all subsequent buildings in Ireland show similar detail to English architecture; but owing to the hardness of the building stones and the poverty and unrest of the country, the detail is generally poor and the mouldings few and shallow. All the abbeys and churches were built so as to stand a siege, and some of them differ little in appearance from feudal castles.

Notwithstanding the change in architectural style, it is surprising that the interlaced ornament still survives, and is to be seen in the capitals at Jerpoint Abbey, and in the masons' marks at Cashel, Holy Cross, and many other buildings down to the sixteenth century. The fifteenth century must have been a very flourishing time for the building trade, as most of the abbeys which now stand,—whether in ruins or not,—show details of that period. Any Elizabethan work is generally poor, and the only details are large mullioned windows. During the eighteenth century, and particularly during its last eighteen years, a large number of public buildings were erected in Dublin in the Classic style. The Parliament House, Four Courts, and Custom House, are buildings of which any city may be proud.

The above remarks are merely introductory, as I now intend to exhibit a number of photographs done by myself of buildings from the earliest periods, and trust that you will excuse any shortcomings in the views, as, being only an amateur, my work will not bear comparison with that of men who devote themselves wholly to it as a pursuit.

Mr. Robinson then, by means of the lime-light, exhibited a fine collection of 106 photographs taken by himself. The first showed a cromlech, supposed to have been erected about 600 B.C., and which was similar to these found in Brittany. This was followed by a view of the entrance to the tumulus at New Grange, the passage and internal chambers of which are comprised of large stones, with slabs laid across. A very fine selection of Celtic crosses were shown, notably those of Clonmacnoise, a great seat of learning in early times; of St. Columba, Kells; of Castledermot, made of granite, and showing the interlaced ornament; and that of Tuam, a tall cross, having sockets at the base. One cross at Monasterboice, stands 25 ft. high, and several of the crosses have panels with various Christian subjects. Mr. Robinson compared these Irish crosses with a fragment of a cross found at Leek, Staffordshire, which showed the interlaced ornament, the same ornamentation being also found in the porch of Bakewell Church. Some interesting views of Round Towers were also exhibited, notably that of Swords, dating back to A.D. 512. The doors of these towers had been a considerable height from the ground, showing that they were used as places of refuge. Several of the towers were shown built in and incorporated with churches, the early ones being constructed



of rubble, and the later ones of ashlar. Mr. Robinson exhibited a drawing of the Round Tower at Brechin, taken from the *Builder*, which showed its great resemblance to the Irish towers, and pointed to the fact that they were built by kindred peoples. Then followed some excellent views of the valley of Glendalough, with the remains of its towers and churches. The early churches and oratories were extremely small, that on the Hill of Howth being only 8 ft. wide and 14 ft. in length. The detail of the arches of these small churches was explained, the interlacing ornament being carried into everything. When the Anglo-Normans conquered Ireland, they, of course, brought their own style of architecture with them, King John's Castle at Trim being similar to Rochester, Norwich, and other castles erected at the same period. Some examples of the fortified abbeys were shown, with small cloister garths, partaking of the character of the cloisters of Spain and Italy. Several photographs were shown of Jerpoint Abbey founded by O'Donoghoe, King of Ossory, in 1180, of the Cistercian Abbey of Mellifont, founded in 1142, by Devorgilla, and of St. Francis' Abbey, now converted into a brewery. These were followed by views of St. Patrick's and Christ Church Cathedrals. Mr. Robinson then dwelt at some length on Irish domestic architecture, showing some old buildings in Kilkenny, Tuam, and other towns, and several of the old and picturesque, though dirty, streets in the vicinity of St. Patrick's Cathedral, Dublin. Many of the old houses, now removed, were of brickwork of Flemish character. The lecturer concluded by exhibiting some examples of the Dublin buildings of the Classic period, including Trinity College, the Four Courts, the Bank of Ireland, and the Custom House.

The Chairman, at the conclusion of the lecture, proposed a vote of thanks to Mr. Robinson, to whom he said they owed a deep debt of gratitude for preparing the photographs, and coming from Dublin to exhibit them (applause).

The motion having been seconded, it was carried by acclamation.

Mr. Robinson briefly replied, and the proceedings terminated.

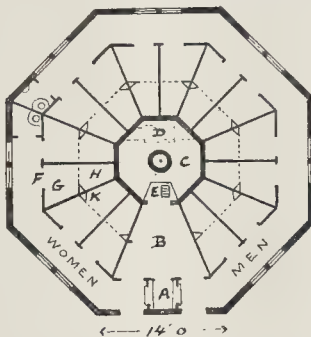
#### THE CULTS AND MONUMENTS OF ANCIENT ATHENS.

THE fifth and last lecture, delivered on November 30, was concerned with the Street of Tombs of Athens. Miss Harrison began by showing from illustrations the various stages of a Greek burial—the *prothesis*, or lying-in-state of the dead man; the *ekphora*, or carrying out of the body, when he was borne to his last resting-place in the Outer Kerameikos, just outside the Dipylon Gate. Many of the tombs are still on the actual spot where they were erected; many more are in the Museum at Athens, or in different collections in Europe. We are struck, in the majority of the Athenian grave-reliefs, with the resemblance which they bear in treatment and technique to the Parthenon marbles. One probable theory to account for this is that after the building of the Parthenon many of the workmen were employed in sculpturing reliefs for the tombs or *stelai*. When we examine a series of these reliefs of the fine period, we find that the subjects represented are simple scenes of every-day life. We are, moreover, struck by the so-called Attic reserve with which the scenes are treated. Reserve, however, as is well known from such descriptions as those of Lucian, was scarcely the characteristic of Greek mourning—where loud lamentation and tearing of hair and garments formed great part of the proceedings. The explanation of this restraint in the art-representations connected with death must be arrived at by studying archaic *stelai*. The Peloponnesos, as the home of all the early cults of Greece, gives us the original art-types. In a most ancient Spartan relief (Berlin) we see the dead man and woman in a heroic aspect, become almost god and goddess. They are seated on a chair, with snakes and a dog to mark them as divinities of the under world. A procession of tiny worshippers, their living descendants, offer them gifts. A slightly later Spartan relief shows a similar design—but the place of the god or heroic ancestor is now usurped by the mortal man himself for whom the *stela* was raised. His name, Timokles, is written above him. In the Athenian *stelai* the very grouping of these early art-types often remains, but the

actors have become mortal; their actions are no longer those of worship given or received, but a common, every-day act. Yet the direct transmission of the sacred hieratic tradition forces the sculptor to keep to a type far removed from sensational emotion. When, as occasionally happened, they departed from these traditions, the art became bad. In the later *stela*, then, the dog is no longer the type of the under world, but the faithful hound of the dead man. Often it is a parting scene between mother and children, where the latter take the place of the worshippers. In the beautiful and well-known *stela* of *Hegeso*, representing a maid giving a jewel-box to her mistress, the maid is but a variation of the worshipper with offerings. In later myths of the Lower World Charon, the ferryman on the Styx, plays an important part. He is often represented on the *lekkythos* used for funeral purposes. The second important mythical element was the Siren, so often seen represented in Greek funeral reliefs. Sometimes the Siren alone forms the whole sculpture of the *stela*, as in the beautiful Siren statue at Athens. Sometimes she is sculptured above the funeral slab, on which the dead man is represented. Of all these Athenian graves perhaps the most interesting is that of Dexileos—partly because of its extreme beauty, partly because he was one of the knights who fell at Corinth (B.C. 394). This is his private monument, but Pausanias (1.29) mentions the public monument of those who were killed at Corinth. This relief, showing a young soldier on horseback with his lance in rest, is typical of the Greek view of death. Death to them was a thing to be met bravely, but when they had to face it for those they loved, they found consolation more in the memory of what the dead man had been in life than in the belief, to them always vague and shadowy, of a future life.

#### PUBLIC DOUCHE BATHS.

A HOT or cold douche, soap, and a clean towel,—all for a penny! This feat has been accomplished in the city of Frankfort, and the establishment, which has been erected in the centre of a small square in the workmen's quarter, already receives from 200 to 300 bathers daily. The general plan is of the simplest kind: an octagonal enclosure, each side about 14 ft.



long, contains, first, a passage, and then a number of wedge-shaped cells, converging upon a central octagonal hot-air drying space for linen, in the middle of which rises the chimney-stalk of the heating apparatus. The entrance front contains two doors, for men and women respectively, with a pay-office, A, common to both. There are four cells for women and ten for men, with a water-closet to each division at the end of the passage. B is a towel-store, C the drying-room. A lean-to roof covers the passage and cells, 12 ft. high at the eaves, rising to 15 ft. next the inner octagon, which is 20 ft. high and divided into two stories, the drying-room, C, below, with a chamber over, containing the large hot-water circulating cistern, D. Steps at E lead to the basement (inner octagon only), where the furnace and fuel-store are placed. The following is the description of the cells or cabinets, which are all alike. A sliding door, F, admits the bather into a small dressing-room, G, furnished with chair, looking-glass on wall, hooks on door, and linoleum carpet. Thence he proceeds to the further end, H, this portion being divided from the former by a waterproof curtain, to prevent the splashing reaching the

clothes in G. Here he finds a basin with hot and cold water, and the douche proper, the temperature of which he can regulate at pleasure, whilst standing on a wooden grating, below which the water is carried off into the drain. The small triangular ducts, K, admit warm air, and as the partitions dividing the cells are only 7 ft. 6 in. high, these ducts transmit an equal temperature throughout the interior. An upright gas bracket is fixed on the top of each partition.

The whole structure only cost 930*l.*, the furniture, linen, &c., 70*l.* more; total, 1,000*l.* Considered financially, and taking the average number of bathers per diem at only 200 at a penny each, the gross income would be 250*l.* per annum; and allowing, say, 150*l.* of this for fuel, water, attendance, and wear and tear, there remains an interest of 10 per cent.—an ample margin of profit for an undertaking which well merits the attention of some of our philanthropists.

#### COMPETITIONS.

**Oley Sewerage.**—In the competition for the best scheme for sewerage and sewage disposal for Oley, Yorks, the premium has been equally divided between Mr. W. H. Radford, C.E., of Nottingham, and Messrs. Brierly & Holt, of Manchester.

**New Abattoirs for Douglas (I.M.)** At the last meeting of the Douglas Town Commissioners, it was resolved to erect new abattoirs on a site known as the "Lake Yard," situated near the railway station. Plans submitted in open competition by Mr. Thomas W. Cubbon, architect, Birkenhead, were unanimously recommended by the committee and adopted by the board. The scheme comprises eight private slaughter-houses, one public slaughter-house, with the necessary lairage accommodation attached, and large cooling-house or dead meat market; also accommodation for pig slaughtering and dressing. The estimated cost of the scheme, including site, amounts to about 7,000*l.*

#### ARCHITECTURAL SOCIETIES.

**Liverpool Architectural Society.**—At a meeting of Professional Associates of this Society, held at the society's room on Thursday evening, the 29th ult., the present condition of the society was discussed. In the end, a number of suggestions for the general improvement of the society were agreed to, and a copy forwarded to the President and Council, together with a request that a special meeting be called to take them into further consideration.

**Manchester Architectural Association.**—At the third ordinary meeting, held on Tuesday last, Mr. A. H. Davies-Colley, A.R.I.B.A. (the President), opened a discussion on "The Improvement of the City," in which Messrs. Chadwick, Hodgson, Mee, and Wilkinson took part. The following resolution was afterwards carried: "That this Association respectfully recommend to the Corporation the formation of a Committee composed mainly of gentlemen outside the Corporation, whose duty shall be to advise on all artistic questions connected with street improvements."

**Edinburgh Architectural Association.**—This association met on the 29th ult., the President, Professor G. Baldwin Brown, M.A., in the chair. After the usual preliminary business, Mr. David Macgibbon, architect, read a paper entitled "The Castles of the Western Highlands and Islands of Scotland." After a short account of the periods into which Scottish civil architecture might be divided, attention was drawn to the large number of castles of the first period (or thirteenth century) still preserved in this region, and the value of these in connexion with the early history of Scottish architecture, comparatively few specimens of that age being left in the more populous parts of the country. The origin of these castles was then considered, and the light thrown upon them by the general history of the Highlands and Islands, and the conclusion drawn was that they were erected by the Royal authority, and held by a custodian appointed by the Crown. The internal evidence of the buildings pointed to their belonging to the thirteenth century, when the islands became part of Scotland, and when the use of stone and mortar was introduced in castle building. Plans and views of Mingary, Duart, Castle Tirlim, Castle Swin, Skipsness, Urquhart, and a number of other castles of the thirteenth century were exhibited and explained. Numerous other examples corresponding with the various styles on the mainland were illustrated and



explained, showing that the Scottish style was universal over the whole country, including the isles, for a period of five hundred years.

#### THE FALL OF BUILDINGS AT THE WEST-END.

ON Wednesday afternoon Dr. Danford Thomas, Coroner for Central Middlesex, resumed and concluded the inquest on the bodies of the six men who were unfortunately killed by the fall of buildings in Great Titchfield-street, as already mentioned in the *Builder*.

Among the witnesses called was Mr. George Appleton, builder, of 141, St. John's-hill, who said he had examined the ruins of the fallen building, and he found that the weight of the building stood upon a 14-in. wall. In his opinion, the wall was not sufficiently strong to carry the weight. The wall was built in the ordinary way with mortar, and, in his opinion, it had crushed in itself. He should certainly himself have used cement instead of mortar. He should not have built such a wall without calling the attention of the architect to it. In his opinion, the columns in Riding-house-street had the heaviest weight to carry, and fell first, causing the weight to go on the other columns, and that the wall fell with it.

Mr. Miller, the architect, said he had ascertained that the girder in Riding-house-street had a weight of 37 tons 19 cwt. upon it, and the other girder 2½ tons upon it at the time of the accident, and the other girders in Great Titchfield-street had 14½ tons on them. He considered the 14-in. wall sufficiently strong to carry the weight put upon it. He had formed no opinion whatever himself as to the cause of the accident.

Mr. Joseph Jennings, District Surveyor for South Marylebone, deposed that he saw the foundations, and considered them good. The work, generally speaking, was very good, and seemed to be proceeding satisfactorily in accordance with the Act. He had since tested the mortar, and found it was good. He considered the girders as well as the columns strong enough to bear the weight put upon them. He was not prepared to state the cause of the accident.

Mr. George Pluckrose, partner in the firm of Messrs. Oldrey & Co., gave evidence that the works were carried out strictly in accordance with the plans and specifications. He certainly thought that the weight ought to have been more equally distributed. That not being done was, in his opinion, the main cause of the accident.

Mr. Frederick Thomas Reed, engineer, said he had examined the *debris* of the premises, and came to the conclusion that the cause of the collapse of the building was the centre columns, on which there was a weight of 33 tons, and the 14 in. brickwork underneath giving way.

Mr. George Hackford, architect and surveyor, deposed that, in his opinion, the cause of the accident was the central column giving way,—not being sufficiently strong to carry the weight.

Mr. H. H. Collins, District Surveyor for the Eastern Division of the City of London, said he was clearly of opinion that the cause of the collapse was the ground-floor giving way by the heavy weight put upon it. He did not put any responsibility on the architect for this accident. The District Surveyor had no power whatever of suggesting any alteration in buildings being erected, unless they considered it to be a dangerous structure.

After some further evidence, the jury returned a verdict of "Accidental Death," adding that

"The said jurors, after hearing the evidence of the experts, are of opinion that the 14-in. wall, built with mortar, was not sufficiently strong to carry the weight of the superstructure, which on a continuous iron truss system [the *Times* report is singular in calling it "Benson's"] was concentrated upon the column in the centre of the building in Riding-house-street, and the jurors consider that this was the cause of the sudden collapse of the building. The jurors consider that such iron columns should have been placed on brick piers built with cement, and further that the practice of loading the floors of new buildings with materials used for their construction and otherwise should be avoided, as they are likely to cause strains upon the building generally. The jurors are further of opinion that the architect, Mr. Miller, should, in the exercise of his discretion, have taken greater care in designing such building, so as to ensure their stability without risk of any kind; further that they consider that enlarged and discretionary powers should be conferred on District Surveyors so as to permit of more efficient supervision than they at present possess."

#### BUILDERS' BENEVOLENT INSTITUTION: ANNUAL DINNER.

THE forty-first anniversary dinner in aid of the funds of this institution was held on Thursday the 23rd ult., at Carpenters' Hall, London Wall. Mr. J. Howard Colls, President of the Institution, occupied the chair, and was supported by Mr. Alfred Rosher (Master of the Carpenters' Company); Mr. John Aird, M.P.; Mr. H. H. Bartlett; Mr. Arthur Lucas; Sir George Chubb; Prof. Roger Smith, F.R.I.B.A.; Mr. Chateaufort Clarke, F.R.I.B.A.; Mr. Thomas Buehill, F.R.I.B.A.; Mr. Rickman; Mr. Banister Fletcher, F.R.I.B.A.; Mr. G. Burt, J. P.; Col. Stanley Bird, and other friends of the institution, the whole company numbering about 230.

The Chairman gave the toast of "Her Majesty the Queen, the Prince and Princess of Wales, and the rest of the Royal Family."

Mr. J. W. Hobbs (Mayor of Croydon) gave "The Army, Navy, and Reserve Forces," Major Bruton replying for the "Army and Navy," and Col. Stanley Bird for "The Reserve Forces."

Sir George Chubb proposed "The Houses of Parliament," for which Mr. John Aird, M.P., responded.

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," said that the charitable institutions were the pride of this country and the envy of other nations. The builders had not been backward in the good work, and he was proud to say that the most distinguished members of the trade had been his predecessors in the chair. The members of all professions and trades were liable to misfortune and reverse. The business of a builder was deeply interesting, and there was nothing monotonous about it except Saturday night (laughter). It was a manufactory of a vast number of articles, subject to difficulties both above and below ground. Sometimes intense heat brought its calamities, and at other times intense frost, or too much wind. The responsibility of the builder never ceased, but lasted as long as he lived, for if anything went wrong he was sure to hear of it. He did not wish to say anything against the professions with which they were associated. As a rule nothing could be fairer than the treatment the builders received at their hands, but at the same time many of the claims on this Institution came from men who had suffered from the exceptions to that rule—from the architect who had supplied defective drawings, and from the quantities of inefficient material, surveyors. Any of those troubles was likely to lead to disaster, and they ought to remember that however stable they might feel at the moment, any one of them might encounter such a calamity as would make them glad to apply for help to such a society as the Builders' Benevolent Institution. Unfortunately the Institution had of late been suffering from the depression of trade, and the subscriptions had fallen off. If there was a time when an institution like this ought to be supported it was in times of depression, and he asked them to support him, and show the world that the builders were a benevolent race. The chairman added that as Mr. George Plucknett, J.P., the hon. treasurer, was not with them that evening, they would simply drink the toast without reply.

The toast having been duly honoured, The Chairman next gave "The Health of the Carpenters' Company," referring to the kindness of the Company to the building trade, or any branch of it.

Mr. Alfred Rosher (Master of the Company) replied, and said that it was the duty of the Company to do what they could for the advancement of the craft.

Mr. Arthur Lucas proposed "The Health of the Chairman and President," adding that every one who knew Mr. Howard Colls knew that whatever he undertook he entered into *con amore*, and it would be difficult to find a worthier occupant for the Presidential chair.

The toast was well received, and the Chairman replied in suitable terms.

Mr. H. H. Bartlett gave "The Architects and Surveyors." The presence of so many members of the professions showed their sympathy with the builders. The work done by the architects of the present day would, he believed, stand comparison with that of any of the great architects of the past. In fact, there was no important thoroughfare in the metropolis in which they could not see works rising around them which must tend to elevate the taste and character of the people. In old times the architect and surveyor were coupled together, but the less that was the case the better, as the surveyor should hold the balance between the architect and the builder. He coupled the toast with the names of Mr. T. Chateaufort Clarke and Mr. T. M. Rickman.

Mr. Chateaufort Clarke said he believed at times the architects must have been looked upon as ogres, but that feeling was passing away, and the builders felt they could not trust themselves more comfortably than in the hands of a respectable architect. At the same time, the architects never could carry out their work successfully without putting their trust in a responsible and respectable builder. They were, therefore, there in a sort of partnership, and it was a sincere pleasure to him to be present.

Mr. Rickman responded for the surveyors. Mr. Maton gave the concluding toast, "The Vice-Presidents, Committee, and Stewards," which was responded to by Messrs. T. F. Rider and J. T. Bolding.

In the course of the evening subscriptions and donations amounting to the unusually large total of 1,053*l.* (of which sum 894*l.* appeared in the President's list) were announced.

#### CASE UNDER THE BUILDING ACT.

At the Marylebone Police-court, Messrs. Daw & Son, of Kensington, builders, were summoned by the Metropolitan Board of Works for unlawfully forming a street without giving two entrances of the statutory width of 40 ft., contrary to 25 and 26 Vic. c. 102, and By-law. Mr. Thos. Burton, solicitor, appeared for the Board; and Mr. A. C. Glen for the defendants.

The facts were as follow:—In 1886 the defendants submitted plans to the Board for their approval, such plans showing a way 60 ft. wide, and open at both ends, as required by the By-law. The way in question was to lead out of the north side of Baywater-road, Paddington, on the Shaftesbury House Estate, and was to be called "Torwood-garage," and the street was proved by the Board on condition that no barriers were at any time to be erected, or other obstructions caused to the free use by the public of the said road. After such approval the defendants leased certain portions of the road, and out of the way were commenced by the different owners, and they also commenced to build a lodge at one end of the road, considerably reducing the width of the way.

On behalf of the defendants it was contended that the way was a private one, and the Act did not apply. After hearing the evidence, Mr. De Rutzen said he would view the *locus in quo*, and give judgment in a day or two. At the adjourned hearing Mr. De Rutzen said he had viewed the spot, and he found that it was a "new street," but that the erections at the ends thereof were of a merely temporary character, they being simply put up for the protection of workmen's tools, and therefore he should dismiss the summons without costs, leaving the Board to take any act on hereafter which they might think proper if more substantial erections were put up.

Notice of appeal was given by the Board.

#### CONCRETE FLOORS.

SIR,—Some time ago you suggested that I should send you a detailed statement about the concrete floors of the building at No. 63, Lincoln's Inn-fields. I have delayed doing so till now, as I wished to describe another experiment at the same time, and both only after they had been some time completed.

I have made concrete floors in two ways, in three buildings of very different class, and in each instance the result has been satisfactory.

Except for its Doubling-stone front and some parts of the party walls, which are brick, the large eight-story building in which I am writing, and which was built from my designs, is entirely of concrete,—walls, partitions, foundations, floors, and roof. The foundation of the main block is a single slab of cement concrete, 3 ft. thick, and on this (without other footings) the walls were formed of river ballast, coke breeze, and cement.

The floors were put in as the walls arrived at the various levels. The size of nearly all the rooms is about 19 ft. by 15 ft. Across these areas 4 in. by ½ in. wrought-iron bars were set on edge, with 2 ft. intervals, and not less than 6 in. bearings on the side walls and partitions. A series of ½ in. round bars, arranged lengthwise of the room, was threaded through holes in the flat bars, also with 2 ft. intervals, so that the floor-space was divided into squares 2 ft. each way. Likewise all the ends of each series of 4 in. by ½ in. bars were threaded with one of these ½ in. bars about an inch from their extremities, so that, as the wall of the next storey was built, this outer round bar was built in and effectually secured the ends of the main bars therein. Where adjacent sets of 4 in. bars had their ends resting on one partition, the ends were made to pass each other, and threaded on the same round bar, which in such case was put in the middle of the thickness of the partition. Finally, between each pair of 4 in. bars, and lying on the ½ in. round bars, a ½ in. square rod was placed, with each end running a few inches into the wall. This network of rods was formed on a platform of rough boards, and blocked up ½ in. above it. The concrete was made of coke breeze and Portland cement, mixed in the usual way and well beaten down between and over the bars and their bearings to a total thickness of 7 in. Over these concrete cores a surface, which in most rooms consisted of granular grit and cement paving an inch thick, was laid at the time the walls were rendered. The ceilings,



like the walls, were plastered with Martin's cement, on a scientific, and disintegrated with Orr's washable "duresco." The roof-surfaces were covered with asphalt. Externally the concrete walls were rendered with Portland cement, and disintegrated with "duresco,"—a material which (as well as the same maker's silicate paint and enamel) experience has led me to value highly. The staircases are in all cases (by choice of the owner) built with walls on either hand instead of with open wells. A sloping slab of concrete, like that of the floors, and made in position in the same manner, bears on the wall on each side and carries the pressed concrete steps, the ends of which merely abut against the walls. The floors, roofs, and stairs, formed as above said, are exceedingly strong and rigid, and there is not a known crack in any one of them.

The second building referred to is a warehouse off Great Queen-street. Here the floors were required to be strong enough to carry heavy goods and machinery in motion. They were divided into 15 ft. bays by means of rolled-iron girders and columns, and these carried a framework of bars similar to that previously described, but with the 4 in. bars only 1 ft. apart, and the small square rods omitted. The surface was laid as an arch, with flat upper surface, the springing of the soffit being from the bottom flange of the iron girders, and the thickness at the crown about 9 in. The floor-surface was of granite grit and cement, and the roof was asphalted. The walls of this building were entirely of concrete, rendered with Portland cement internally and externally, and disintegrated with duresco. The columns and the soffits of girders were cased with fire-proof plaster, all other parts of the girders being covered by the concrete floor. Everything is quite sound and flawless.

The third use of concrete was in the case of a stable building in Sussex. Here the walls were of local stone externally, with a cement concrete core, and a brick inner lining. The floors and roofs were of concrete without girders, and four of them had a clear span of 20 ft. by a length of over 60 ft., so that they consist of monoliths of those dimensions, without any intermediate support whatever. They are of broken brick and Portland cement, rendered on soffit and floor-surface with Portland cement and sand, the roofs being asphalted. In these large floors, the bars are  $\frac{3}{4}$  in. by  $\frac{3}{4}$  in., set on edge, 9 in. apart, and with  $\frac{1}{2}$  in. round bars laced through holes in their ends over the walls. No other bars or rods are used. The total thickness, including cement, ceiling, and surface, is 12 in. Where the bearings were shorter the thickness was reduced, and the bars were put further apart. There is no crack or settlement anywhere.

WM. SIMMONS.

63, Lincoln's Inn-fields, W. C.

#### ELM CHURCH.

SIR,—May I be permitted to mention that the priest's door at Elm Church, noticed by Mr. Greenslade in his too-brief description of that fine church (page 379 ante), as "an interesting feature," owes its unusual position—"in the extreme north-east corner" ("in the extreme north-east corner") indeed actually opening within the altar rails,—to the chance having been omitted? Mr. Greenslade mentions that "the East wall has been rebuilt, with a new Decorated window inserted," but he does not seem to be aware that at the rebuilding the wall was erected some feet westward of its original site; and thus, as Mr. Greenslade's carefully-executed drawings show, the proportions of the chancel, and the general outlines of the church were much injured. Mr. Greenslade fails to call attention to the remarkable similarity between the tower of Elm Church and,—*parvis componere magna*,—the western tower of its not very-distant neighbour, Ely Cathedral. In each we have a square tower supporting an octagon flanked by octagonal turrets. Elm still preserves the small, low lead spire which was foolishly pulled down at Ely some time towards the close of the last century.

EDMUND VENABLES.

**The Tilbury Docks Arbitration.**—A news agency circulates the following:—"The four years' arbitration between Messrs. Kirk & Randall and the East and West India Dock Company terminated on Wednesday in an award by Sir Frederick Bramwell in favour of the contractors on all points. The arbitrator decides that the turning-out was illegal, and that there was due to the contractors for work done at the time of their eviction a balance of upwards of £195,000, apart altogether from damages for the wrongful eviction, which have yet to be assessed, and for which the contractors' claims are £300,000. The dock company has to pay all costs."

## The Student's Column.

### ARTIFICIAL STONES.—XXIII.

*Methods of Indurating Artificial Stone by Exposure to Gases (continued).*

**M**ACBAY'S patent (1876, pat. 776) involves the admixture with the stone composition of any suitable fibres, such as those of jute, flax, tow, hemp, reha, cotton, coir, bran-husks, pine needles, &c., &c. A more recent patent bearing on the subject is that of Keller (1885, pat. 13,699), in which it is directed to add to gypsum or other binding cement that may be used in the production of artificial stone, small pieces of metallic wire to impart a fibrous nature to the stone and increase its power of resisting tensile strain.

One portion of Boden's patent (1881, pat. 1,817) relates to the insertion of wires in the body of the stone blocks, so that they can be better bound together. The stone itself was to be formed of an outer shell of porcelain or other earthenware having a surface glaze, and filled in with a composition made up of one part of lime and two parts of sand, moistened with a solution containing shellac, glue, borax, alum, and soda.

Ransome obtained in 1865 provisional protection only for an arrangement for strengthening artificial stone by moulding the composition round pieces of hoop-iron.

An expedient of a different nature to any we have been discussing was that patented by R. Searle, in 1882, with a view to the production of a dense, hard stone. Portland cement is mixed with hot water, placed in suitable moulds, and connected with an air exhaust pump to extract all the air, the cement being allowed to set in an exhausted atmosphere; the stones may be protected with a coating of water glass, mixed with soluble silica in the form of Farnham stone.

#### Miscellaneous Stone Compositions, &c.

Of the miscellaneous compositions there are several of some interest. Melted sulphur has been utilised by several patentees as a binding material for the earthy or stone base. In 1859 J. Simon, of Paris, patented a composition which he termed "Zeidolite," composed of a mixture generally of about 42 lb. of powdered stoneware or glass, to 19 lb. of sulphur, melted and mixed together at as low a heat as possible and run into moulds. The substance resists acids, moisture, and atmospheric influences, and does not melt under 250° Fahr., so that in some circumstances it can be used as a substitute for asphaltum. Ponton, in 1861, brought out a substance he called "Silicious Stone-ware," which does not differ essentially from "Zeidolite," being composed of ground flints, quartz, Lynn sand, tripoli, or other silicious powders, mixed with sufficient melted sulphur to bind them together. By a later patent (1877, pat. 1,884), the same inventor patented artificial stone manufactured by working up clay, or similar material with sulphur and water, then moulding, carefully drying, and finally heating up to 250° Fahr. to melt the sulphur and bind the whole mass together. Brault, Watkins, & Smith's "Improved Marble or Decorative Compound," patented in 1880, has sulphur as the cementing material, to two to one, in about the proportion of two to one, any kind of powdered stone, marble, ivory, bone, &c., mixed with any suitable colouring matter.

In 1883 a patent was obtained by Mr. T. Smith, of Sanbury, for a building or paving composition, which was to be composed of the cleansed scrapings of macadamized roads finely ground and mixed with chalk and coke-dust, in the proportion of 43 parts of the "macadamized scrapings" to 20 parts of chalk and 37 parts of coke-dust; the mixture is then incorporated with melted sulphur. In some cases sand may be substituted for road scrapings. In a second patent, taken out in 1885, Mr. Smith improves upon this compound, and directs that the debris of macadamized roads, broken china, &c., be washed, calcined, ground to fine powder; 60 parts of this powder are mixed with 40 parts of sulphur and melted together in a copper pan provided with an agitator. When in a fluid condition it is poured on to a slab and allowed to cool in a thin layer; and when required for use it is again melted and cast into moulds of the necessary shape.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

14,184, Window and Door Fasteners, J. G. W. Fairbairn and R. Jones.

The fastener which is the subject of this patent is made in two parts, one the socket and the other the bolt. The socket is simply a base-plate, with tapered or parallel hole to receive the end of the bearing and a scroll-piece. This slot-piece and bolt is encased, and the bolt is operated by means of a loose key. When the fastener is turned the scroll-piece catches in a pin of the bolt, and forces it forward.

17,733, Flushing Water Closets, &c., J. Breiden.

An open-bottomed hollow cylinder and a disc or piston, working with a syphon in the cylinder, is the important claim in the specification of this invention. The bend of the syphon is flattened horizontally, so that a slight rise of the water-level suffices to set the syphon in action. The body of the supply cistern pipe and fittings are cast all in one piece.

17,919, Shape of Sash or Balance Weights, D. S. Heys.

The weights which are the subject of this patent are made conical-shaped at each end, so as to pass one another without catching. The cord is run longitudinally in the centre of the weight, and fastened somewhat similarly to the ordinary method, but in the middle of the weight. The weight always hangs perpendicularly, and does not catch in passing.

1,062, Chimney Pots and Terminals. G. F. Verini.

According to this invention, the chimney-pot is closed at the top by a lid, and round the shaft vertical rectangular shafts are cut, and these openings are fitted with a radial projecting plate protecting the slot from side wind. Gear is attached by which, when one of the slots is closed by the protector, the other is automatically opened.

12,325, Sash Fasteners, W. Yelland.

The fastener to which this patent relates operates by a rod or bolt at the meeting points of the sash and also at the top where the sash is let into the framework of the window. A screw-threaded shank operates the bolts and also forms the locking arrangement.

12,741, Preventing Down-draught in Chimneys, J. B. Tongue.

In order to reduce the expense in fitting tops, according to this invention, the chimney-pot is fitted with a series of outlets and flaps curved at the edges. Another modification is the use of movable flaps and corresponding outlets in a pot of suitable shape and material, and in flues where the prevention of down-draught may be required.

#### NEW APPLICATIONS FOR PATENTS.

Nov. 23.—17,022, J. Howie, Syphon Flushing Cisterns.—17,049, T. Mattock, Plumbers' Shave-hooks.—17,059, J. Brockie, Sash-fastener.—17,062, T. Birnbaum, Flexible Mouldings or Fliers for Joinery and Decorative Work.

Nov. 24.—17,117, F. & E. Cornish, Fastenings for Window-sashes, &c.

Nov. 26.—17,149, D. McDonald, Workmen's Can Appliance.—17,186, W. Maguire, Water-closet Basins, &c.

Nov. 27.—17,215, A. Richardson, Window or Sash-fastener.—17,247, L. Scott, Hot Water Warming and Flushing Stoves.—17,250, T. Edwards, Fire-escapes and Ladders.—17,257, W. Cussans, Colouring and Ornamenting Portland Cement, &c.

Nov. 28.—17,288, C. Lindsay, Art Decoration and Register Grates or Stoves.—17,305, J. Haywood and J. Hunt, Sash-fasteners, &c.—17,312, R. Warwick, Fibrous Plastering Work, &c.—17,325, A. Armstrong, Electrical Bell, Battery, and Push for Street-doors.—17,364, C. Young, Automatic Bolt for Double Doors.—17,372, G. Stephan, Movable Timber Sawing-machines.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

13,030, F. Abbey, Trap for Waste and Drain-pipes.—13,970, H. Bates, Wood Screws.—14,382, T. Dalton, Opening, Closing, and Securing Skylights, &c.—14,956, A. Bremner, Combined Latch and Bolt.—14,980, J. Colton and J. Lambert, Glass Mosaic Work.—15,022, R. White and P. Ayton, Door Furniture.—15,136, E. Cain, Weather Strips of Doors.—15,393, H. Planner, Disinfecting Apparatus for W.C.'s, Drains, &c.—15,568, H. Richardson and E. Dickinson, Guards for Brickmaking Machines.—15,601, C. Harcourt, Electric Bell push Fittings.—15,605, L. Barber, Ladder.—45,621, E. Lyon, Decorative Window-panes or Panels.—15,795, P. Davies, Lead Tanks and Ventilating Same.—15,573, J. Clayton and C. Tindall, Water Closets.—15,920, J. Lightbody, Water Cisterns.—16,019, H. Owens, Mechanism for Operating Fanlights, &c.—16,155, J. Thornton, Fireplaces.—16,203, F. Hawkes, Sash Cords.—16,214, J. Phelps, Eaves, Gutters, and Roofs.—16,408, J. Sharples, Flushing Water-closet Pans.

#### COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

546, C. Wright, Fastener for Windows, Doors, &c.—388, H. Waddington, Draught Preventers for



Doors and Windows.—1,046, W. Radish, Fire-grates.—1,072, E. Reynolds and G. Catford, Circular Saw-benches.—1,199, A. Brown, Ventilator.—1,255, J. Kaye, Bolting and Unbolting Doors, Windows, &c.—1,389, O. Erfurth, Holder or Support for Scaffolding.—3,236, H. Whitehouse and J. Clifford, Sash Fasteners.—7,604, W. Boie, Door Barrel Bolts, &c.—7,578, G. Hobson, Metal Floorings or Roofs for Bridges, &c.—14,587, J. Kirkbride, Window-sashes.—14,968, W. Stead, Sliding Window-sashes, &c.—15,061, G. Kenrick, Hinge.—15,235, G. Hayes, Sheet-Metal Lathing.—15,434, W. Yull, Drain Taps.—15,489, G. Jennings, Sanitary Appliances for Water-closets, &c.

## RECENT SALES OF PROPERTY.

## ESTATE EXCHANGE REPORT.

|                                                                             |        |
|-----------------------------------------------------------------------------|--------|
| Nov. 27.                                                                    |        |
| By HARMAN BROS.                                                             |        |
| Brixton—168, Stockwell Park-road, 55 years, ground-rent £2                  | £750   |
| By ESTIMAX BROS.                                                            |        |
| Hornsey—5, Ormond-road, 90 years, ground-rent £20. 10s.                     | 180    |
| New Southgate 30, Holly Park-road, 90 years, ground-rent £3                 | 90     |
| By YARROW, BULL & COOPER.                                                   |        |
| West Ham—1 and 2, Myrtle-villas, freehold                                   | 820    |
| East-road, The Congregational Church, freehold                              | 875    |
| The Duxley, Sedgley, and Wolverhampton Tram-ways, with plant                | 10,800 |
| Sedgley—Dudley road, a plot of freehold land                                | 200    |
| Tottenham—Gr. and-rents of £20. 5s., reversion in 89 years                  | 955    |
| Dalston Ground-rents of £20 a year, term 57 years                           | 550    |
| Nov. 28.                                                                    |        |
| By WALKER & RENTZ.                                                          |        |
| Hammersmith—18, The Grove, freehold                                         | 600    |
| 54 and 54, The Grove, freehold                                              | 1,160  |
| Nov. 29.                                                                    |        |
| By DOUGLAS YOUNG.                                                           |        |
| Walworth—1, 2, and 3, Thomas-place, freehold                                | 710    |
| Clapham-road—No. 400, term 25 years, no ground-rent                         | 500    |
| By J. J. DRYVERELL.                                                         |        |
| Fulham—41, Lillyville-road, 90 years, ground-rent £5                        | 1,325  |
| By A. BOOTH.                                                                |        |
| Drury-lane—6 and 7, Wild-court, freehold                                    | 1,385  |
| Camden-road—No. 117, term 54 years, no ground-rent                          | 1,600  |
| No. 149, term 64 years, ground-rent £15                                     | 670    |
| By MOSS & JAMISON.                                                          |        |
| Bermundsey—15, 17, and 19, Lucy-road, 45 years, ground-rent £11             | 356    |
| By NEWBORN & HARDING.                                                       |        |
| Highbury—37, Crompton-road, 57 years, ground-rent £7. 12s.                  | 275    |
| South Hackney—7 and 8, Braughton-road, 54 years, ground-rent £4. 0s.        | 185    |
| Stoke Newington 50, Winston-road, 72 years, ground-rent £5                  | 405    |
| Caledonian-road 87, John-street, 56 years, ground-rent £2. 2s.              | 1,290  |
| Green Lanes 4, Brownwood park, 71 years, ground-rent £11                    | 1,000  |
| Hoxton—104 and 106, St. John's-road, 17 years, ground-rent £40              | 270    |
| Holloway—9 to 15 odd, Yorbury-road, 79 years, ground-rent £37               | 430    |
| By E. STIMSON.                                                              |        |
| Camberwell—3 to 11 odd, Southampton-street, 92 years, ground-rent £12. 10s. | 95     |
| 64 and 66, Fiveton-street, 25 years, ground-rent £2. 4s. 6d.                | 225    |
| 9, Chiswell-street, 25 years, ground-rent £1                                | 355    |
| Peckham 1, 12, and 14, Blenheim-road, 89 years, ground-rent £20             | 380    |
| Southwark—48, Trinity-square, 61 years, ground-rent £6                      | 240    |
| 131, St. George's-road, 13 years, ground-rent £5. 1s. 8d.                   | 230    |
| Clerkenwell—17, Wilmington-square, 27 years, ground-rent £8                 | 335    |
| Fulham 27 to 33 odd, Walham-avenue, 95 years, ground-rent £20. 6s.          | 376    |
| Lambeth—21, 23, and 24, Hunt-street, 53 years, ground-rent £10              | 240    |
| Ground-rents of £35. 4s. 6d., term 21 years                                 |        |
| Ground-rents of £23. 10s., term 21 years                                    |        |
| By FIELD & SON.                                                             |        |
| Rotherhithe—17 and 19, Swan-lane, 72 years, ground-rent £4                  | 600    |
| Buckhurst Hill Thonet Villa, and a plot of land, freehold                   | 290    |
| Bermundsey—101, Abbey-street, 76 years, ground-rent £4. 1s.                 | 395    |
| 59, Revery-road, 52 years, ground-rent £3                                   | 345    |
| Peckham—15, Marsden-road, 37 years, ground-rent £5. 8s.                     | 1,100  |
| 72 to 80 even, Lower Park-road, 25 years, ground-rent £21. 3s.              |        |
| Nov. 29.                                                                    |        |
| By DYER, SON, & HILTON. (On premises.)                                      |        |
| Eltham, High-street—Globe House, freehold                                   | 750    |
| By WORSFOLD & HAYWARD. (At Dover.)                                          |        |
| Dover 41, Castle-street, freehold                                           | 470    |
| St. Margaret's—Freehold house, with garden                                  | 210    |
| Dover—16, Pencester-road, with stabling, freehold                           | 1,750  |
| 1, Queen-street, freehold                                                   | 1,475  |
| 3 and 4, Priory-street, freehold                                            | 860    |
| 2, 3, and 4, Thornton-lane, freehold                                        | 220    |
| 6, Pleasant-row, freehold                                                   | 125    |
| 49 and 50, East Cliff, freehold                                             | 210    |
| 83, Limekiln-street, 49 years, ground-rent £5. 10s.                         | 640    |
| A plot of freehold land in Barton-road                                      | 95     |
| Ewell—A plot of freehold land                                               | 95     |
| By FARMER, BROTHER, ELLIS, CLARK, & CO.                                     |        |
| Regent-street—Nos. 129 and 131, term 32 years, ground-rent £97. 10s.        | 8,600  |
| 201, Regent-street, and 67, Conduit-street, 33 years, ground-rent £12       | 10,100 |
| Kenington—2, 8, Mary Abbott's-terrace, 18 years, ground-rent £10. 3s. 4d.   | 850    |

|                                                                                |         |
|--------------------------------------------------------------------------------|---------|
| Westminster, Victoria-street—Ground-rents of £320, reversion in 77 years       | £11,100 |
| Westbourne Park, A. J. Saints-road—Ground-rents of £240, reversion in 75 years | 1,000   |
| Tavistock-crescent—Ground-rents of £230, reversion in 75 years                 | 1,015   |
| Ground-rents of £28. 10s., reversion in 75 years                               | 1,200   |
| St. Mary's-road—Ground-rents of £18, reversion in 74 years                     | 450     |
| Finbury Park Ground-rents of £42, reversion in 89 years                        | 1,048   |
| Ground-rents of £178, reversion in 89 years                                    | 4,463   |

|                                                                     |       |
|---------------------------------------------------------------------|-------|
| Nov. 30.                                                            |       |
| By H. A. HENDERSON.                                                 |       |
| Clapton—131, Rushmore-road, 88 years, ground-rent £5                | 200   |
| Stroud Green—85 and 87, Fernie Park-road, 90 years, ground-rent £17 | 605   |
| By BAKER & SONS.                                                    |       |
| Putney—12, Fairfax-terrace, 97 years, ground-rent £21               | 2,200 |
| Harlesden—5, Nicolson-road, 86 years, ground-rent £10               | 380   |
| Enfield Ground-rents of £78, reversion in 98 years                  | 1,680 |
| Ground-rents of £60, reversion in 98 years                          | 1,280 |
| Ground-rents of £25, reversion in 98 years                          | 625   |
| Wilkesden—Ground-rents of £42, reversion in 92 years                | 780   |

## MEETINGS.

## MONDAY, DECEMBER 10.

London Institution.—Professor Sylvanus Thompson, B.A., on "The Colours of Polarized Light." II. 6 p.m.  
Society of Arts (Crystal Palace). Captain W. de W. Abney, F.R.S., on "Light and Colour." III. 8 p.m.  
Society of Engineers.—Annual General Meeting. 7.30 p.m.  
Leeds and Yorkshire Architectural Society.—Mr. J. A. Heaton on "Beauty in Colour and Form. How to Seek, Where to Find." 7.30 p.m.

## TUESDAY, DECEMBER 11.

Institution of Civil Engineers.—Mr. J. Oliver Arnold, F.C.S., on "The Influence of Chemical Composition on the Strength of Bessemer-Iron Castings." 8 p.m.

## WEDNESDAY, DECEMBER 12.

Society of Arts. Mr. W. H. Deering, F.C.S., on "Explosives." 8 p.m.  
Society of Engineers.—Annual Dinner, Guildhall Tavern, Grosvenor-street, 6.30 p.m.  
Liverpool Engineering Society.—Mr. W. N. Blair on "The Salt Water Supply to the Public Baths, Bootle." 8 p.m.

## THURSDAY, DECEMBER 13.

Society of Telegraph Engineers and Electricians.—(1) Annual General Meeting to receive the Annual Report of the Council and for the Election of Council and Officers for the ensuing year. (2) Discussion on Mr. H. Edmunds' paper on "A System of Electrical Distribution." 8 p.m.  
Society of Antiquaries.—8.30 p.m.  
St. Paul's Ecclesiastical Society.—Rev. J. R. Buchanan on "Herne Church, Kent." 7.30 p.m.  
Edinburgh Architectural Association.—Dr. A. C. Elliot, C.E., on "Recent Departures in Electrical Engineering." 8 p.m.

## FRIDAY, DECEMBER 14.

Architectural Association.—Mr. W. Doubleday on "Symbolism." 7.30 p.m.  
Institution of Civil Engineers (Students' Meeting).—Mr. J. King-Salter on "The 28-knot Spanish Torpedo Boat, *Ariste*." 7.30 p.m.

## Miscellaneous.

**The Glass and Ceramic Gallery at the British Museum.**—It has been calculated that in the section of glass and ceramic art the value of the donations of private individuals is ten times greater than the sum total of the grants received from the Treasury, and probably the same may be said of the other departments. We will not stay to inquire the cause, but in the case of museums private munificence is invariably found to be stimulated by national liberality, and especially when it is known that handsome and spacious galleries will be provided for the objects. In this particular the parsimony of the Government has been altogether short-sighted. Years ago it was pointed out that the land on which the houses stand in Montague-street, Montague-place, and part of Bedford-square, that enclose the Museum, ought to be secured for its extension. Had this been done the removal of the Natural History departments to South Kensington—a most unpopular proceeding—would not have been necessary. Even now, considering the natural expansion of the collections, at least some portion of the site must be acquired. Fortunately the patriotic bequest of Mr. William White supplies funds for the erection of the recent galleries, of which that of glass and ceramics is a portion; but it is clearly undesirable that the Museum should be dependent on private generosity for the extension of its buildings. Rather such gifts or bequests should be exclusively devoted to the enrichment and completion of the collections. At the present time, when scientific excavations are being energetically prosecuted in so many quarters, it will need a plentiful relaxation of the purse-strings, both public and private, if the Museum is to hold its position in relation to those of other countries, and as the Acropolis of Art and learning of the English-speaking race.—*From the Art Journal for December.*

**Sale of Building Land at Romford.**—Last week Messrs. Baker & Sons held a large sale of freehold building land, at the Golden Lion Hotel, High-street, Romford. The property consisted of eighty plots, being a portion of the Heath Park Estate, Romford, situated close to the town, and about ten minutes' walk from the Romford station of the Great Eastern Railway. The estate was described as situated on high ground, with commanding and picturesque views of the country for several miles around, and specially adapted for the erection of houses and shops. The estate, which is the property of the National Standard Land Company, has a frontage of upwards of 1,200 ft. to the main high road to Brentford, several new roads having also been laid out, intersecting the estate in a north-easterly direction. Most of the plots submitted have frontages of 20 ft., with depths averaging from 120 ft. to 150 ft., some larger plots having frontages from 40 ft. to 80 ft. There was a large company present. Mr. Baker, the auctioneer, before inviting offers, adverted to the rapidly-increasing value of building-land in Romford and the locality, observing that, as a business centre in Essex, the population was fast increasing, and that there was at present little uncovered land in the neighbourhood. He added that there was every prospect of property in the neighbourhood being still further increased in value and Romford becoming a favourite residential locality, as the town would shortly be placed in communication with Southend, and also with Tilbury, by the new lines of railway which the Great Eastern Company are now constructing from their main line to those two towns. There was a very active demand for the several lots submitted, out of the entire number offered sixty-five being sold. The plots having 20 ft. frontage realised from 25s. to 27s. each, whilst a corner shop plot, having a frontage of 80 ft. to Brentwood-road, and a depth of 95 ft., was sold for £65; and another corner plot, close adjoining, having a frontage of 55 ft., and a depth of 140 ft., realised 50s. The proceeds of the sale amounted to about 1,900s.

**The English Iron Trade.**—The better tendency in the English iron trade which showed itself last week is maintained, the market having grown stronger. Notwithstanding decreased shipments in November, and increased stocks at the end of the month, prices of pig-iron have advanced, the prospect as to the future being reassuring. Scotch warrants have gone up, and makers' iron is also quoted higher than last week. Middlesbrough iron may be said to have gained 3d. on the week. In Lancashire, prices of pig are firm, and the same holds good for Lincolnshire, Derbyshire, and Staffordshire brands. Hematites in the North-West are 1s. better in price. Manufactured iron is in fairly active demand, the tendency of values being in an upward direction. Tin-plates are in rather better inquiry, and the tone of the market has improved. There is great activity in steel, rails especially being largely ordered. It is reported that the Ebbw Vale Company has booked an order for 80,000 tons of rails, at what price is not stated; but rates are very firm generally. There is a large consumption of shipbuilding material. Activity continues to prevail in the shipbuilding and engineering trades, and engineers are now able to secure better prices.—*Iron.*

**Aluminium.**—Another alloy of aluminium, which possesses very nearly the same qualities of lightness as the pure metal, and has, in addition, the advantage of being readily soldered, has been introduced by M. Bourbonge. Tin, which easily alloys with aluminium, cannot be used directly for soldering, but impure tin, which has already dissolved aluminium, acts with the greatest facility on the pure metal, and that alloy, after solidification, is equally acted on by pure tin. Observing these facts, M. Bourbonge determined to rub heated aluminium with an alloy of aluminium containing 45 per cent. of tin, and then to solder the surfaces so prepared in the usual manner. The alloy of aluminium, with 10 per cent. of tin, also possesses the property of soldering with tin, having at the same time the useful qualities of the pure metal. The alloy will take a fine polish, and does not tarnish when exposed to air. Cold hammering gives it a certain quality of elasticity. The discovery is one of considerable value and further increases our interest in this valuable metal upon which so much attention has been turned of late.



**Death of Mr. C. F. Hansom, Architect.** We regret to announce the death, on the 30th ult., of Mr. Charles Francis Hansom, F.R.I.B.A., President of the Bristol Society of Architects, at the age of seventy-two. Mr. Hansom received his professional training from his brother, the late Mr. Joseph Aloysius Hansom, architect, — founder, in 1842, of the *Builder*, and inventor (in 1836) of "Hansom's Patent Safety Cab" (see *Builder*, July 8, 1882). He early showed considerable originality in his work, and by careful study obtained a great reputation, not only amongst the public, but also amongst his professional brethren. He was a most successful designer of churches, and in the Gothic revival of 1840, he took a prominent part. According to the *Bristol Times and Mirror*, he laboured so assiduously that altogether he designed between sixty and seventy churches. There are many buildings in the neighbourhood of Bristol which illustrate Mr. Hansom's style. He was the architect of Clifton College and the University College, and he superintended the rebuilding of St. Paul's Church, Clifton, after it was destroyed by fire, in 1867. The first church erected by the Bristol Church Extension Commissioners — Christ Church, Barton-hill — was also designed by him. The Pro-Cathedral at Clifton, which is said to have been at one time falling to pieces owing to the settlement of the foundations, was restored, and a new front added, under the direction of Mr. Hansom, who, in addition, renovated the Roman Catholic church at Bath. During the last few years Mr. F. B. Bond has been in partnership with Mr. Hansom, and since then the firm have done a great deal of work for the Bristol School Board. The interment took place at Ferryhead Cemetery, Bath, on Tuesday.

**Messrs. J. W. Hobbs & Co. (Limited).** — The annual staff dinner of this well-known building company took place on Saturday evening last, at the Holborn Restaurant, Mr. G. C. Kentish, secretary, in the chair. About ninety sat down to table. Mr. Woollett, in proposing the principal toast "J. W. Hobbs & Co., Limited," and Mr. Kentish, in replying on behalf of the Company, spoke of the great enterprises in which they were or had been engaged, including the erection of such large blocks of buildings as Carlisle Mansions, Westminster; the Hôtel Victoria, Northumberland-avenue; Whitehall Court, on the Victoria Embankment; the lofty block of buildings at Albert-gate, Knightsbridge; Queen's Buildings (industrial dwellings), covering the site of the Queen's Bench Prison, Southwark; the new buildings on the Salisbury Estate, Strand (for which excavations have just been commenced); Coventry Park estate (villa residences), Streatham, and other undertakings. Mr. Hobbs, the managing director, was unable to be present, owing to duties incumbent upon him as Mayor of Croydon. His son, Mr. Walter J. Hobbs, responded to the toast of his father's health. The other toasts included the Managers and Foremen ("proposed by Mr. Currie, cashier, and responded to by Messrs. Austing and Pounds"), "The Sub-Contractors" (proposed by Mr. Holland, and responded to by Mr. Stephen Collins), "The Office Staff" (proposed by Mr. Owens, and responded to by Mr. B. Bailey), "The Architects and Surveyors" proposed by Mr. Charles Till, and replied to by Mr. Rossiter, and "The Visitors" (proposed by Mr. Caine, and replied to by Mr. C. Randall).

**The Lord Mayor on Plumbing.** — At a meeting held last week at the Lambeth Polytechnic Institute, the Lord Mayor said that in going through their workshops he was delighted beyond measure to see they had a class for practical plumbing. There was no greater need at the present time than a perfect knowledge of sanitary science. One of the Livery Companies of the City (the Plumbers' Company) had established a system of registration for plumbers, and at the last examination twenty out of thirty were rejected. It might be asked, "Why should plumbers be registered?" He would answer, Why should chemists be registered? The object was that they might not poison their neighbours; but where a chemist poisoned one, had plumbing poisoned fifty. Therefore he said, "Go on with your plumbing classes and your technical schools, and the probability is you will greatly improve the condition in which you live."

**Election of a Royal Academician.** — It is announced that at a general assembly of Academicians and Associates held on Wednesday evening, Mr. John Bagdall Burgess, painter, was elected an Academician.

**Extensive Sale of Leaseholds in Regent-street and Ground-rents in Westminster and Westbourne Park.** — On Thursday last week, Messrs. Farebrother, Ellis, & Co. conducted a very large sale of West-end properties at the Auction Mart. The Regent-street property comprised the shop and premises, No. 129, on the west side, which realised 4,000l. The adjoining premises, No. 131, were also sold for 4,600l. Both properties are held from the Commissioners of Woods and Forests, for a term of ninety-nine years from April, 1821, at a rental for the entirety of 90l. per annum, and 7l. 10s. per annum in lieu of land-tax. No. 129 yields a profit rental of 295l. per annum, and No. 131 yields a profit rental of 296l. per annum, with reversion in 1894 to an increased annual value. Messrs. Farebrother also sold the corner-shop and premises, 201, Regent-street, and 67, Conduit-street, held for a term of ninety-nine years from 1822, at a ground-rent of 42l. per annum. These premises form the principal portion of Messrs. Ormer's establishment, the well-known piano manufacturers and music publishers. They produce a present profit rental of 468l. per annum, with reversion at Midsummer next to an estimated greatly-increased annual value. They were sold for 10,000l. The same auctioneers also sold several important ground-rents, secured on properties in Victoria-street, Westminster, and in Westbourne Park, which realised 19,301l., — the total proceeds of the day's sale being brought up to 38,850l.

**Liverpool Engineering Society.** — An open meeting of this society was held on November 28, Mr. C. H. Darbishire, Assoc.-M.Inst.C.E., in the chair, when, among other matters, a new method of stowing and lowering of ships' life-boats was explained by Captain Gell, and the difficulties and dangers attending the launching of such life-boats in cases of wreck during storm were discussed. Geological specimens dug up in the construction of sewerage works in Essex were exhibited by Mr. E. R. Window.

#### PRICES CURRENT OF MATERIALS.

| TIMBER.                      | £. s. d. | £. s. d. |
|------------------------------|----------|----------|
| Greenheart, B.G. .... ton    | 8 10 0   | 7 10 0   |
| Teak, E.I. .... load         | 9 0 0    | 14 0 0   |
| Sepudia, U.S. .... foot cube | 0 2 3    | 0 3 0    |
| Ash, Canada, ..... load      | 3 10 0   | 5 0 0    |
| Birch " " " " " "            | 3 10 0   | 6 0 0    |
| Elm " " " " " "              | 4 0 0    | 5 0 0    |
| W. G. Danisic, &c. ....      | 2 0 0    | 4 0 0    |
| Oak " " " " " "              | 2 0 0    | 4 0 0    |
| Canada " " " " " "           | 5 10 0   | 7 0 0    |
| Pine, Canada red " " "       | 3 5 0    | 4 0 0    |
| " yellow " " " " "           | 3 10 0   | 5 10 0   |

| TIMBER (continued).                              | £. s. d. | £. s. d. |
|--------------------------------------------------|----------|----------|
| Lath, Dantec, .....athom                         | 4 10 0   | 5 10 0   |
| St. Petersburg, ..... log                        | 5 0 0    | 6 10 0   |
| Wainscot, Bira, &c. ....                         | 2 15 0   | 4 5 0    |
| Odessa, crown, ..... 100                         | 2 15 0   | 3 5 0    |
| Dead, Finland, 2nd and 1st, std. 100             | 10 0 0   | 10 10 0  |
| " 4th and 3rd. ....                              | 7 0 0    | 9 10 0   |
| Rigs " " " " " "                                 | 7 0 0    | 8 0 0    |
| St. Petersburg, 1st yellow " " "                 | 10 10 0  | 15 10 0  |
| " 2nd " " " " "                                  | 9 0 0    | 10 0 0   |
| " white " " " " "                                | 8 0 0    | 10 10 0  |
| Swedish, ..... 8                                 | 8 0 0    | 10 10 0  |
| White Sea, ..... 0                               | 0 0      | 17 10 0  |
| Canada, Pine, 1st " " "                          | 16 0 0   | 25 10 0  |
| " 2nd " " " " "                                  | 11 0 0   | 17 10 0  |
| " 3rd, &c. " " " " "                             | 9 0 0    | 10 0 0   |
| " Spruce, 1st " " " " "                          | 7 0 0    | 8 10 0   |
| " 3rd and 2nd " " " " "                          | 6 15 0   | 8 15 0   |
| New Brunswick, &c. " " "                         | 5 10 0   | 12 0 0   |
| Battens, all kinds " " "                         | 0 11 8   | 0 14 6   |
| Flooring Boards, sq. 1 in, prepared, First " " " | 0 8 0    | 0 10 9   |
| Second " " " " "                                 | 0 5 8    | 0 7 8    |
| Other qualities " " "                            | 0 0 3    | 0 0 3    |
| Cedar, Cuba, ..... 0                             | 0 3      | 0 0 3    |
| Honduras, &c. .... 0                             | 0 3      | 0 0 3    |
| Australian " " " " "                             | 0 0 2    | 0 0 3    |
| Mahogany, Cuba " " "                             | 0 0 4    | 0 0 5    |
| St. Domingo, cargo average " " "                 | 0 0 4    | 0 0 5    |
| Mexican " " " " "                                | 0 0 4    | 0 0 5    |
| Tobacco " " " " "                                | 0 0 4    | 0 0 5    |
| Honduras " " " " "                               | 0 0 4    | 0 0 5    |
| Box, Turkey " " " " "                            | 5 0 0    | 12 0 0   |
| Walnut, Italian " " "                            | 0 0 4    | 0 0 6    |

#### METALS.

|                                 |         |           |
|---------------------------------|---------|-----------|
| Iron—Bar, Welsh, in London, ton | 4 17 6  | 5 0 0     |
| " " " " " " " " " "             | 4 7 6   | 4 10 0    |
| " " " " " " " " " "             | 5 15 0  | 7 0 0     |
| Copper—                         |         |           |
| British, cake and ingot, ton    | 80 0 0  | 80 10 0   |
| Best selected " " " "           | 80 10 0 | 82 0 0    |
| Sheets, strong " " "            | 85 0 0  | 88 0 0    |
| Chili, bars " " "               | 78 0 0  | 80 0 0    |
| YELLOW METAL, ..... lb.         | 0 0 7   | 0 0 7 1/2 |
| LEAD—                           |         |           |
| Pig, Spanish " " " " "          | 13 0 0  | 13 1 3    |
| English, common brands, ton     | 13 0 0  | 13 7 6    |
| Sheet, English, ..... 14        | 0 0     | 14 10 0   |
| SPRINGS—                        |         |           |
| Silesian, special " " "         | 12 15 6 | 13 15 0   |
| Ordinary brands, " " "          | 12 10 0 | 13 12 6   |
| TIN—                            |         |           |
| Banca " " " " " " "             | 103 0 0 | 0 0 0     |
| Bulletin " " " " " " "          | 103 0 0 | 0 0 0     |
| Strait " " " " " " "            | 100 0 0 | 0 0 0     |
| Australian " " " " " "          | 100 0 0 | 0 0 0     |
| English Ingots, sheet " " "     | 103 0 0 | 0 0 0     |
| Zinc—English sheet " " "        | 22 10 0 | 23 10 0   |

#### OILS.

|                                |         |         |
|--------------------------------|---------|---------|
| Linseed " " " " " " "          | 39 10 0 | 0 0 0   |
| Cocunut, Ceylon " " "          | 27 0 0  | 29 10 0 |
| Ceylon " " " " " " "           | 27 0 0  | 0 0 0   |
| Palm, Lagos " " " " " "        | 28 0 0  | 0 0 0   |
| Rapeseed, English pale " " "   | 31 10 0 | 0 0 0   |
| " brown " " " " " "            | 30 0 0  | 0 0 0   |
| Cottonseed, refined " " "      | 23 5 0  | 0 0 0   |
| Tallow and Oleine " " "        | 19 0 0  | 45 0 0  |
| Lubricating, U.S. " " "        | 5 0 0   | 6 0 0   |
| " " " " " " " " " "            | 7 0 0   | 12 0 0  |
| TURPENTINE—                    |         |         |
| American, in casks, ..... cwt. | 1 14 6  | 0 0 0   |
| Tar—Stockholm " " " " "        | 1 1 6   | 1 0 0   |
| Archangel " " " " " "          | 0 12 0  | 0 12 6  |

### COMPETITIONS, CONTRACTS, & PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

#### COMPETITIONS.

| Nature of Work.                               | By whom required.      | Premium.              | Designs to be delivered. | Page. |
|-----------------------------------------------|------------------------|-----------------------|--------------------------|-------|
| Sea Barrier " " " " " "                       | Filey Local Board      | 25l.                  | Dec. 27th                | ii.   |
| Drinking Fountain, Southampton                | Mrs. B. Sayer's Exors. | 20 Guinea             | Feb. 1st                 | ii.   |
| Courts of Justice, Police & Fire Brigade Stns | York Corporation       | 100l., 50l., and 25l. | Feb. 15th                | ii.   |

#### CONTRACTS.

| Nature of Work, or Materials.               | By whom required.                 | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|---------------------------------------------|-----------------------------------|-----------------------------------|--------------------------|-------|
| New Schools and Teachers' House on old site | Harrow-on-the-Hill, &c.           | Official                          | Dec. 11th                | ii.   |
| Keelings, Tarpaving, &c. ....               | School Board                      | do.                               | do.                      | ii.   |
| Roadmaking Works " " "                      | Lewisham Bd. of Works             | do.                               | do.                      | ii.   |
| Connections from Main Sewers to Houses      | Cheshunt Local Board              | T. Bennett                        | do.                      | ii.   |
| Repairs to Shaft, &c. ....                  | do.                               | do.                               | do.                      | ii.   |
| Roadmaking and Paving Works                 | St. Mary (Battersea)              | Official                          | Dec. 12th                | xi.   |
| Roadmaking Works " " "                      | Vestry                            | do.                               | do.                      | xi.   |
| Works and Materials " " "                   | Fulham Vestry                     | J. P. Norington                   | do.                      | xi.   |
| Roadmaking Works " " "                      | Wandsworth and Clapham Union      | T. W. Aldwinckle                  | Dec. 13th                | ii.   |
| Street Lighting " " "                       | St. George Hanover-square, Vestry | G. Livingstone                    | Dec. 15th                | ii.   |
| New Wing to Infirmary " " "                 | Hornsey Local Board               | T. de Courcy Mead                 | Dec. 20th                | xi.   |
| Street Lighting " " "                       | Wandwich Union                    | J. G. Cook                        | Dec. 20th                | xi.   |
| New Bridge and Removal of Existing Bridge   | Finchley Local Board              | G. W. Brumell                     | Dec. 21st                | xi.   |
| Pipe Sewers, &c. ....                       | Glasgow, Hillhead, &c.            | Joint Bridge Com.                 | Dec. 31st                | ii.   |
| Repairing and Painting Railings, Fimlico    | Hendon R.S. & A.                  | do.                               | Jan. 8th                 | xi.   |
| Laying out Dulwich Park " " "               | Met. Board of Works               | do.                               | Jan. 10th                | xi.   |
| Wesleyan Chapel, Charlton " " "             | do.                               | H. H. Church                      | Not stated               | xi.   |
| Foundations, College Extension              | Liverpool Univ. Coll.             | A. Waterhouse                     | do.                      | xi.   |

#### PUBLIC APPOINTMENTS.

| Nature of Appointment.           | By whom Advertised. | Salary.    | Applications to be in. | Page. |
|----------------------------------|---------------------|------------|------------------------|-------|
| Assistant Surveyor " " "         | Leigh Local Board   | Not stated | Dec. 10th              | xvi.  |
| Balding Inspector " " "          | Widnes Local Board  | 150l.      | Dec. 11th              | xvi.  |
| Assistant Surveyors, R. E. Dept. | Civil Service Com.  | Not stated | Jan. 4th               | xvi.  |





# The Builder.

VOL. LV. No. 2302

SATURDAY, DECEMBER 15, 1888.

## ILLUSTRATIONS.

|                                                                                                      |                           |
|------------------------------------------------------------------------------------------------------|---------------------------|
| Bayonne Cathedral.—West Front .....                                                                  | Single-Page Typo-Gravure. |
| House Front in the Rue St. André, Rouen .....                                                        | Single-Page Typo-Gravure. |
| Chancel, Church of St. Thomas à Becket, Upholland, Wigan.—Mr. Basil Champneys, B.A., Architect ..... | Double-Page Photo-Litho.  |
| House, Upton Park, Slough.—Messrs. Williams, West, and Slatic, Architects .....                      | Double-Page Photo-Litho.  |
| Cottage at Eastbourne.—Mr. W. Kidner, F.R.I.B.A., Architect .....                                    | Single-Page Ink-Photo.    |
| Premises, No. 79, Cornhill.—Mr. W. Kidner, Architect .....                                           | Single-Page Ink-Photo.    |

## Blocks in Text.

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| Fireplaces at Bo'ever Castle .....  | Page 474 |
| Plan of Cottage at Eastbourne ..... | 134      |

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### Sculptors, Painters, and Architects.



UNDER this heading we may fitly devote a few more words to some of the questions and theories in regard to art, which were brought forward and more or less discussed during

the Art Congress last week. For the inconsiderate outsider might be excused if he came away from the Congress with an impression that artists of various classes were much like tradesmen—in one sense at least, that each regarded his own art as the important factor, and the other forms of art as subsidiary to it or incomplete without it. On the whole, perhaps, we might claim that the architects showed the most catholic spirit—as, indeed, from their training in so central a form of artistic expression, with so many relations to other arts, might, perhaps, properly be expected from them. But we had sculptors to assure us that architecture was nothing without sculpture; painters to point out that painting was the central art, and that the business of the architect was to arrange his lights so that paintings could be properly seen; and the handicraft artist to uphold handicraft as the real and true art, while all the rest were a hollow pretence, a claim which *Punch* has satirised this week by showing the leading Royal Academicians engaged with hammers and punches in making useful articles in an artistic form.

This latter division, the craftsmen, appear, to judge from their lucubrations at Liverpool, to be the Ishmaelites of the arts,—their hand is against everyone, and (according to their own account) every man's hand against them. What strikes one most about them is their intense melancholy and despair, and conviction that everything is going wrong everywhere. Of this kind of "wail" the paper by Mr. Garraway, the Master of the Liverpool Art-Workers Guild, is a more than typical specimen. The attacks upon picture exhibitions, which, according to this prophet, are "ruining the arts," and the parade made of his "immense sadness" over the condition of things, are not likely to carry conviction to persons who are in a healthy state of mind, or to persuade them to think that such an exhibition as that, for instance, now open at the Society of Painters in Water-colours, is "ruin-

ing the arts." This kind of jeremiad is so exaggerated that it defeats its own end, and is hardly a matter for serious consideration. Among the papers in a less exaggerated strain, which entered on subjects of criticism as between architecture and the other arts, are some that raise points that are worth discussion; and it is certainly of interest to us to notice how some able representatives of other branches of art look upon architecture.

The "combined meeting" of the sections of "Architecture, Sculpture, and the Allied Arts" on the Friday morning of the Congress, brought out two papers on the relation of sculpture to architecture, one by a sculptor (Mr. Simonds), the other by an architect (Mr. Belcher); both very well written, though on very different lines of reasoning. The main point of Mr. Simonds' paper was that the arts of sculpture, painting, and architecture should not be divorced, but should all be studied and carried on together,—especially sculpture.

"As to our public buildings, it is hardly an exaggeration to say, that they one and all give one the impression of having been stopped for want of funds; for how else were it possible that they could have been left thus undorned? A building that is not designed for decoration with sculpture and painting seems to me as great an absurdity as a tree that was never meant to be clothed with leaf and blossom. Both may be good in their way, and admirable as far as they go; but they do not go far enough. I shall, no doubt, be told that many classes of buildings would be still more absurd if so decorated, to which I reply that I am not talking of such poor sheds as most of us have to be content to live in, which are not architecture at all, but engineering, and usually very badly engineered besides. Though, I confess, I see no reason why even a common farm shed should be without some sort of adornment in the way of carving of beams, trusses, rafter-ends, &c., had not the village carpenter lost much of the old-world skill in the use of his chisel. Nor do I hope that much will be done in our dwellings as long as men build houses on other people's land, not to live in, but to let."

This latter remark touches on a topic, it will be seen, of quite another kind from that involved in the main subject of the paper, and which would lead one so far away from the relation of sculpture to architecture that we can merely allude to it in passing as suggesting a very cogent cause, often overlooked, of the neglect of the artistic design and decoration of the home. No one living in London, certainly, would be very much disposed to spend thought and money in decorations which were all to become the property of a ground landlord; and this condition of things (referred to also by Pro-

fessor Aitchison in his address, printed in another column) has probably more influence on the neglect of domestic art and architecture in London, if not in some other cities, than has been generally realised, and represents one more objection to what, for other reasons, is already regarded as a monstrous system for the tenure of house property. This, however, is scarcely "the relation of sculpture to architecture." Returning to that topic, Mr. Simonds claimed that we should practically recognise the old view of the unity of art, by requiring that all our artists should be simultaneously instructed in the three arts of sculpture, painting, and architecture:—

"The great men were not satisfied with learning one branch only of their business—they learned it all. Building construction, architectural sculpture, and decorative painting were commonly practised by one and the same man, and formed the ground-work of every artist's education; so that a sculptor or a painter who was called in to assist in the decoration of some stately building was able to understand that his work was merely a portion of one great design, and to feel the necessity and have the power of keeping it in harmonious subordination to the whole. Our modern men are excellent as specialists, but, as a rule, we know nothing and care nothing for the art that is outside of our special practice. It is rare to find a sculptor who knows enough of architecture even to design a decent pedestal for a statue, or an architect who has the faintest ideas of sculpture, or who is able to conceive of anything better than the rigid, grim figures with angular draperies that are reproduced, *ad nauseam*, by the regulation ecclesiastical sculptor.

Would it be asking too much to demand that every art student should be simultaneously taught architecture, sculpture, and painting?"

In the discussion, and in answer to one speaker who pointed out the danger of having architecture under the practical control of those who, however good sculptors and painters they might be, would possibly not be very scientific constructors, Mr. Simonds modified his position so far as to say that he did not want one man to practise all three arts, but only to learn them, though he seemed rather unwilling to concede thus much. It was urged that Michelangelo, the sculptor, painter, and architect, failed in the construction of St. Peter's Dome, while Brunelleschi, scientific architect *par excellence*, made a sound and stable job of the dome at Florence. Mr. Simonds's reply, that Brunelleschi was a sculptor also, will hardly stand; Brunelleschi had little fame as a sculptor; he made his fame as an architect; his sculptural knowledge stood him in little



stead in constructing his great work, his scientific knowledge obviously was invaluable to him. It may be doubted, however, whether in the present day, anyone who means serious work as an architect can spare time to study sculpture and painting also, beyond a certain limited extent; an extent which would probably not qualify him (unless he were a natural genius of very exceptional order) to produce sculpture or painting of a high order, although the study of the three arts together could not fail to be of value in educating and strengthening the genius of any one for the practise of one of them. On this practical side of the matter sculptors and painters can hardly speak, because they are so little aware of the importance and increasing complication of the practical problems upon which architecture rests; and if they imagine that these can be turned over to a surveyor, leaving the so-called architect a mere designer of decorations and architectural clothing to a building (which, we conclude, is what they imagine, for they must know that making large buildings involves a great amount of practical knowledge and experience), they would be proposing what would be the ruin of architecture as the art of building. But the fact is, as Mr. Simonds's paper very clearly illustrates, sculptors and painters for the most part have not the least idea what architecture really means. They think, apparently, that it is designing the outside of a building. As many of our readers, at all events, know well enough, it is the designing of a building at once in plan, construction, and external aspect; and plan, which the sculptor and painter probably think a mere piece of engineering or surveying work, is, in the higher forms of building, as distinctly a work of artistic imagination and invention as what is more vulgarly called the architectural design; and any one with architectural training and perception can tell, by a plan alone, whether the deviser of that plan had anything of the feeling and genius of an architect, or whether he was a mere surveyor. But even apart from plan, it is perfectly absurd to talk of architecture as if it necessarily depended on sculptural additions for its completeness. In London, or in England, there is scarcely a structure that is a more striking example of some of the highest qualities of architecture than London Bridge: it has grand lines, large masses contrasted with vast openings, splendid construction, perfect simplicity and suitability to its purpose. The late G. E. Street, who was an architect if ever there was one, referred to it once as "our sublime bridge," and the expression is not too strong. London Bridge has not a particle of sculpture on it, and we doubt whether Mr. Simonds would find many persons to agree that it would be improved by the addition of sculpture. If it be replied that that is too much of an engineering work for our argument, we will take a very different example. Ask any assembly of people who are well acquainted with the architectural monuments of the world to give their vote for what they regard as the most beautiful and poetic production of all architecture, and in all probability the majority will vote for the Taj Mahal at Agra—a building of almost dreamlike beauty, in describing which the duldest writer of travels grows eloquent, which painters love to paint, which has fascinated the whole world; and there is not a particle of sculpture in it! It was built by Mohammedan artists who were forbidden by their very creed to introduce sculpture into their decorations; it is purely a creation of architectural beauty, dependent only on outline and contrast of light and shadow, and architectural detail of inlay and tracery. And does the Taj Mahal look like a building "that has been stopped for want of funds"? And this is only one instance; we might multiply examples. Are we to stand before the mighty pillared hall of Karnak, and see it in imagination as it was when roofed and complete, with its dim shadows and mysterious forest of vast columns, like the portico of the palace of Eternity; or to wander round the vast ruin of the Colosseum;

or stand under the monumental dome of the Pantheon, and see the clouds float across its great central eye; or beneath that other dome of St. Sophia, built dome on dome, by the happiest magic of construction; or stand in a corner of the cloister-garth of Salisbury on a bright sunny day, and see the spire which forms the centre of the pile ascending like a pyramid of frosted silver against the deep blue of the summer sky; and are we to be told that all these are nothing, are failures, because sculpture does not enter into their design? Let sculptors consider the subject more carefully, and learn what architecture means, and what she has accomplished for the delight of man, alone and unaided, before they venture to claim for their own art that it is a necessary and inevitable complement to the architect's production.

Mr. Belcher, in his paper on "The Alliance of Sculpture and Architecture," commencing with the same idea as to the unity of the three arts, admitted that architecture could afford to be the most independent, and could even dispense with aid from sculpture and painting; but his object was to maintain the special alliance between sculpture and architecture, which he illustrated in a more practical manner than is often attempted in essays of this kind:—

"When the site is new and barren of architectural surroundings, then architecture may step in and in some subordinate manner link the statue and its pedestal to earth by spreading flights of steps, balustrading, seats, or other devices, in acknowledgment of its appropriateness and value. Such was Mr. Armstrong's idea for his fine statue of Waghorn, at Cratham. The sculptor in such case must initiate. He should design his own pedestal and architectural adjuncts, in so far that he only needs to associate the architect with himself to carry out the conception with additional knowledge and force."

When, however, the building has been the chief and first object, and sculpture is called in to give further expression to it, then the architect must take the lead, designing the whole work, and indicating the sculptural treatment to which the sculptor must give expression:—

"It is obvious that these ends can only be secured by the joint action of architect and sculptor in actual design. In such a case there would be no leaving 'blocks for carving,' which are intended to cover up some defective or faulty bit of design or some ill-shapen corner, which the architect is at a loss how to treat. Or perhaps the sculptor is called in to put a figure on the top of some column or pier which supports nothing, and is of no constructive utility; or, as it may occasionally happen, a bare space is discovered in the design, a contingency which never happens accidentally in our large cities, for it appears to be as abhorrent to our minds as a vacuum is to nature, and is at once filled with a so-called decorative architectural feature. Or, perhaps, there is an absolute need of plain wall surface to give decorative sculpture its due weight and value. Again, the sculptor can give point to a design by concentrating the attention on the dominant motive. It is by the sculptor's aid that many effects of grandeur and largeness of scale are obtained, for the human figure furnishes the eye with an accustomed scale for comparison."

Also, as in St. Peter's (as Mr. Belcher does not fail to observe), sculpture may, if exaggerated in scale, exercise a powerful detrimental effect in reducing the apparent scale of a building. The following examples of the unity of design between sculpture and architecture are happily chosen:—

"As an instance where, in conjunction with architecture, the alteration of the scale of figures is made to produce an effect predetermined by architect and sculptor acting conjointly, one may mention the west porch of Amiens Cathedral. They had evidently determined that the pious, on approaching the church, should be impressed by its solemnity, for on the pier which separates the central doorway stands a colossal figure of the Lord, called 'Le Bon Dieu d'Amiens,' holding the Book of the Gospels, and on each side of the porch, placed in parallel lines, are the twelve Apostles, their apparent size augmented by a proportion of small figures connected with the representation of the Last Judgment. A similar effect is produced in the south porch at Chartres, and at Autun. Burzuly, where the figures are architecturally treated, cleverly attenuated, and arranged so that they suggest the columns which would ordinarily occupy their position. They are, in fact, a Gothic treatment of Caryatides. The proper use of colossal, or heroic-sized figures, in this manner, in

no way reduces the size of the building when near the eye, and, at a distance they assume the form of the usual constructive features."

This suggestion as to the part which Caryatide figures, or something analogous to them, may play in architecture, so as at a distance to be resolved, as it were, into the architectural elements of the building, is a rather new way of looking at the matter, and one of the best defences that could be made for a species of sculptural adjunct to architecture which is a good deal open to criticism from an architect's point of view, and has at all events been often misused.

Mr. Richmond's valuable paper on "A Strict Method for Study of the Human Figure," though it had not professedly any relation to architecture, illustrates in one point rather curiously the manner in which methods of study in one branch of art may throw light on those of another. Mr. Richmond earnestly protests against the waste of energy, on the part of those who are studying the figure, in making elaborately shaded and finished drawings of the model at rest. The student, he says, is learning nothing in this way that he could not learn from a plaster cast (a statement, by the way, that must surely be taken *cum grano*). Mr. Richmond would have him engaged rather in rapidly drawing various positions of the human figure in action, following with his eye a moving model, and endeavouring to catch and convey its action in various positions.

"That human object standing or lying in one position for two or three hours every day for a fortnight, is not one whit more pitiable than the spectacle of the array of youths whose intelligence is stagnating under their doleful work. The model in front of them is probably not beautiful and not worth dwelling on for study of select form, but he is yet capable of action and movement, and is not action the life of life?" We do not profess to speak as painters, but we have often questioned whether highly-finished drawings, either from the cast or from life, give the student any added power proportionate to the time and labour expended, as far as drawing the figure is concerned. Painting, of course, a colour representation of the figure, is another matter. But our special interest in this case is with the method of scientific study which Mr. Richmond proposes to substitute for the laborious study of surface modelling of the body, and its representation by shading. He proposes that, in place of studying and imitating the effect under light and shade of the modelling and contours of the body, the student of the figure should do as the architect does,—study the sectional contours, and work from that study to their representation by light and shade:—

"It is said the human figure contains a hundred silhouettes, or points of view, wherein all the outlines differ one from the other—that is to say, every one of the hundred views presents us with a new combination of outlines. We do not suppose anybody has been at the pains to count the number of actions of which the *corpus vile* is capable, nor does this matter, for probably they are quite innumerable."

Let us see whether it is possible to suggest a simple method whereby we may in some degree attain a little mastery over the hundred subtleties of a hundred aspects.

We presume (by way of illustration) that an architect sets more store upon his plan and sections of an elaborate building he is studying than upon the shaded elevation,—or, at all events, he values them equally.

A shaded elevation figures a structure at but one moment of the earth's daily progress, whereas section drawings can suggest the application of any light and shade which may fall upon the surfaces and planes represented by them.

What is the human figure but a series of surfaces and planes, large and small, upon which light may fall in as various a way as upon a building? If the architect is so accurate in his study of a building, why are we other artists not equally accurate in our study of the equally elaborate structure which it is our business to know? Beyond all doubt we should be equally accurate.

It appears to us, that very early in the student's career he should master and have at his fingers' ends all the larger planes of the figure, that he should be taught to understand them in their movements and rotations and variety, as well as the extreme simplicity of them."

We will take, as an instance, the forearm, and find it composed of an outer, inner, and front.



surface. Through the rotation of the radius these surfaces are rolled round and change places. The detail upon the moving surface is dragged with it, while the others are quiescent. In the meantime, the plane or surface which occupied the uppermost place has rotated to the undermost. Now, if this principle of movement be made clear to the young student, and he draws from his knowledge the various aspects of the forearm under movement with the very simplest lines rightly, he has gained a far more real knowledge of the structure of the limb than he would have gained by making a finished shaded drawing of only one view of the forearm."

It appears to us that this suggestion opens a new method of mastering the knowledge of the figure for the purposes of drawing, which may be of great service to art-students. The specially interesting point to us, however, is to find an accomplished painter of the figure advocating the same line of study, in regard to that, which every architect pursues in regard to the building he is designing—the study of sectional contour, not of mere arbitrarily-shown pictorial effect.

Mr. Brett's paper on "The Relation of the Pictorial to the Decorative Arts," from which we quoted a short and sufficiently incisive sentence last week concerning a certain unhappy example of decoration, bristles with pungent and suggestive bits of criticism; and while Mr. Brett sums up in favour of pictorial art, as "the art of the modern epoch" (just as Mr. Simonds thinks there can be no art worth having without sculpture), we must compliment him on evincing a far clearer insight into the conditions of architectural art than many of his brethren of the easel appear to possess; and he does not glorify mere decoration into the highest of the arts. Decorative art, he thinks, bears the same relation to fine art as the setting does to the jewel. Its normal tendency, in regard to architecture, is to consort with the cornice, the capital, the archivolt, the string-course, and the window-head. "Good decoration does not spread itself over the wall spaces. It could not have any significance there, and it would spoil the space naturally appropriated to pictures." This, as coming from a painter, is, of course, a little protest in favour of "this our craft," which "is in danger to be set at naught"; we may take that also *cum grano*; but, after all, it is rather a wholesome reaction against the absurd contempt with which the modern school of decorative artists speak of easel pictures. It applies only to the interior of buildings; but Mr. Brett can appreciate the value of plain spaces externally. When the design of a structure is fine, he says:—"The areas are so intelligently considered, and so well adapted to their uses, that any interference with their plainness can only have an injurious effect, and be resented by the spectator." Every architect knows that, but it is not every painter who does. Nothing could be better put than this in regard to the subject of conventionalising decorative design in architecture:—

Good decoration depends on the adaptation of organic forms to a geometrical structure, but for this purpose the imitation of natural objects will not answer, for two reasons: the first is that beautiful natural objects are too difficult to reproduce, and, therefore, too expensive; the second, that they require to be infected with the inorganic or crystalline motive, so as to make them harmonious with the geometrical contours, and take them out of competition with reality, a competition in which their necessary failings would show a painful shortcoming.

And in speaking of the extent to which nature may, or must be, departed from, even in pictorial art, the following sentence is well worth attention:—


"The truth about the pictorial art is, I believe, that however earnestly the artist may wish to give a faithful resemblance of nature, some bias from his individual taste is inevitable; and, when his admiration for the original is enthusiastic, it has the power to exalt his reproduction, so that it produces an effect of sublimity and beauty upon the spectators which surpasses, in their eyes, the charms of the original. And this happy result is often arising from some omission as from actual alteration of the natural forms."

This is one of the best statements we have seen as to the power and nature of what may be called the personal element in landscape painting, the influence of the individual

genius of the artist, which is felt in all great landscape painting, and carries us higher than any mere imitation of nature could.


There are other remarks in Mr. Brett's paper, concerning the decoration and treatment of dwellings, which are so well worth attention that we will take another opportunity of giving them more at length than we can find space for in connexion with these remarks. Two other points only we may here advert to. One is, that Mr. Brett especially claims for the pictorial art not only that it possesses a far wider range of human interest than ornament, - in which we agree with him entirely, but that its productions possess the undeniable advantage of portability, "which quality—in a land where the jerry-builder reigns and controls our lives—is a very important one to connect with our artistic treasures." Mr. Simonds, in his paper before referred to, mentioned, as one of the influences antagonistic to art in the present day, the indifference of the public to every form of art which is not portable. Both considerations have relation to the same cause: the want of permanence of tenure in the home: a new instance of the influence of the jerry-builder and the leasehold system on art, and of the manner in which methods of building and of holding building property act upon the life and pursuits and tastes of the community. The other point is the remark in the course of Mr. Brett's paper, that "in early times a great deal of art of the utmost value was done for nothing, or at least not paid for in current coin of the realm; the notes then current, viz., promises to pay in a future state, were deemed more than equivalent." Mr. Brett thinks there is practically no such currency now. It is not our *moder* to argue that point, but there is the other influence, which can be felt as strongly now, the love of doing a thing as well and as beautifully as possible for that sole object; and we are happily not without that spirit among our artists even now.

#### A SEWAGE SCHEME FOR GLASGOW.

 NEW scheme has just been submitted, by official request, to the Town Council of Glasgow, having for its object the disposal of the sewage of the city otherwise than by draining *simpliciter* into the Clyde. The author is Mr. Young, who has long managed the town's cleansing department, and in that station has well earned the confidence of the public. He is careful to point out that he is not an engineer, and therefore cannot fully answer for the engineering features which would be necessitated were the works he proposes to be entered upon with a view to realisation. The scheme, therefore, is in some sort amateurish, —a fact, indeed, which the reporter himself admits with sufficient frankness. He had previously inspected the sewage disposal contrivances of numerous towns in England and on the Continent, in this covering pretty much the same ground as those who have gone out on the same weary quest from Glasgow in the procrastinating years of the past. The examples of Birmingham and Nottingham seem to have most attracted him, particularly that of the latter, which is solely on the principle of irrigation by intermittent downward filtration, that is to say, sewage-farming in its latest development. This is the principle which he recommends to Glasgow. Mr. Young practically begins by assuming that provision will be made for keeping streamlet and storm waters from mixing with the sewage, so that these may run into the Clyde direct, as now. This feature is passed over lightly, as if it were a small matter; and in the estimates given it is by no means clear that allowance has been made for the necessary conversion or duplication of the numberless house and street drains which any scheme of initial sewage-sorting would entail on a city so committed as Glasgow is to the water-closet system. Negligence or overlook here, it is needless to say, points to a serious vitiation of the conclusions arrived at. He assumes, also, that Loch Long will not hereafter be avail-

able for the deposition of redundant matters; but, on the other hand, he does not point out any alternative to Loch Long, and either overlooks the contingency altogether, or holds that the proposed farm will assimilate every atom of the solids offered to it, in addition to withdrawing all polluting constituents from the surplus liquids. In brief, the proposal is to acquire a huge tract of flat farm land in Renfrewshire, stretching south-westward from the city along the courses of the rivers Black Cart and Gryfe, and summing to a total of 4,500 acres. Glasgow crude sewage is to be massed in a reservoir immediately below Govan on the south bank of the Clyde, and thence forced through cast-iron pipes forward to the field of operations, the nearest boundary of which would be three or four miles away. The high-level sewage of the north side would be syphoned under the deepened Clyde, by gravitation, to the Govan rendezvous; while the contents of the low level intercepting main drain would be forced into the same receptacle by pumping power. After leaving Govan, the outward-bound sewage, finding the enlarged navigation works of the White Cart, or Paisley Ship Canal, barring the way, would clear these by syphoning under; after which the course for the great irrigation field presents itself comparatively unimpeded. Mr. Young holds that 1,500,000*l.* will provide everything necessary, including 620,000*l.* for purchasing and stocking the area to be farmed. Interest on capital outlay for the sewage works proper within Glasgow and along the route, with the annual cost for pumping and maintenance, are estimated at 38,300*l.*, while the farm, if well managed, is credited with the ability to return a rental of 2*l.* 5*s.* an acre, besides interest on the 80,000*l.* expended in stocking. The figures reckon on a farm deficit barely exceeding 6,000*l.*, which added to the other annual costs, as above, brings the total yearly charge up to 44,300*l.*, equal to an assessment of about 2*d.* per *l*t**. The scheme as submitted to the Town Council is suggestive rather by what it passes over than by what it particularises; and when the schedules come under the eye of the expert and specialist Mr. Young's comparatively comfortable conclusions may be made to change complexion to a serious extent. The report presents an alluring picture of clusters of thriving divisional dairy farms, the property of the city and commanding the custom of the city, whose cattle would feed and fatten luxuriously on the Italian rye grass, mangolds, swedes, &c., copiously and almost perennially produced on the spot by an abundance of the richest manures. Although the plain of the Gryfe and Black Cart is in the vicinage of a considerable suburban population, and, moreover, lies right in the eye of the wind which most frequently blows over Glasgow itself, it is denied that any nuisance would be set up; and, altogether, the reporter seems to have fully convinced himself that there is no difficulty ahead, financial or otherwise, and that the happy solution of a great problem is of a surety to be found in the plan he submits. The plan is now under the formal consideration of the Council.

#### NOTES.

 COMPLAINTS continue to be made against the harbour works on the coast of Ireland, constructed under the divided responsibility of different Boards, and maintained by the local authorities to whom they are finally transferred, to which we referred some time ago. When the estimates for the ensuing year were before Parliament last week, there was a discussion on Ballycotton Pier. Mr. Sexton went so far as to say that the pier there, now called the old pier, fell down after it had been taken over from the charge of the Irish Board of Works by the Grand Jury of the county. The Financial Secretary to the Treasury visited the pier lately with Mr. Wolfe Barry, C.E., who has been appointed by the Government to make an independent report upon that and



other works; but it has not yet been made, and Mr. Jackson could not fully reply to the numerous questions addressed to him. But soon after Parliament meets again, members will have an opportunity of discussing the matter after having read Mr. Barry's report, which will be placed in their hands as soon as possible. When Mr. Jackson visited Ballycotton, Dr. Tanner pointed out to him a fishing-boat at half-tide, about a hundred yards or less from the harbour entrance, "hanging on by its tail." When the engineers, he said, fell out,—of the boat, it is supposed,—the fishing-boats got stranded. The only member who had a good word to say for the Board of Works was Mr. T. Healy, who thanked the Board for what it had done in opposing the erection of a new railway bridge over the Liffey.

WE commented some time ago upon the debate on the insanitary condition of the Royal Barracks at Dublin. The death of this week announced of an officer of the Black Watch (Captain Speid) from typhoid fever, contracted in these barracks. In campaigns soldiers must face death from disease as much as from bullets, but it is shameful that a Government should in time of peace condemn men to death through pestiferous buildings. The death in question is that of an officer, and not the first, either, from the same cause, but it is said—though we have not had an opportunity of verifying this statement—that private soldiers are continually dying from disease contracted in these barracks. We hope attention will be called to this question in the House of Commons.

THE failure of the Southwark and Vauxhall Water Company to obtain water from their deep boring at Streatham, however disappointing it may be to the Company, has been of much assistance to science in adding another link to the chain of evidence as to whether coal exists or not under London. After passing through 16 ft. of drift, 147 ft. of London clay, 78½ ft. of sands and clays, collectively known as the Lower London Tertiaries, 623 ft. of chalk, 29 ft. of Upper Green-sand, 188 ft. of gault, and 38½ feet of Jurassic beds, the boring-tool entered a red sandstone without fossils at a depth of 1,120 ft. from the surface. Our readers are doubtless aware that a normally red sandstone occurs above the coal-measures, whilst another, termed the Old Red Sandstone, or Devonian, is found under them. The question which at once arose when the boring tool at Streatham entered the red sandstone was, whether it was the one above, or below the coal measures? The absence of fossils makes it exceedingly difficult to decide which it is. If it is the sandstone above the coal-measures, then there is the possibility of coal being obtained at a lower level, but if it should turn out to be the Old Red Sandstone, there would be very little hope of coal being found under it; at all events, it would be rash to bore deeper. From the fact that the ridge of old Primary rocks running under London from east to west is, no doubt, very much faulted and complicated, like its lateral extremities coming to the surface in the Boulonnais and Ardennes on the one hand, and in Somersetshire on the other, it is not certain whether by thrust-fault, or overfold, the relative superposition of the rocks may be altered or otherwise. Therefore, the circumstance that the red rock at Streatham may be Devonian does not conclusively prove that coal is absent under that spot at a lower level, though it would be too speculative a matter to warrant the continuance of the boring, if their Devonian age were clearly established. From our knowledge of the very altered condition and homogeneous nature of the Devonian rocks, both in the Ardennes and Somersetshire; and seeing that the red sandstone at Streatham is barely altered, and occurs in thin beds of variable lithological character, we incline to the belief that the rock met with in that boring is not of Devonian, but of New Red Sandstone, age. During the past few days, the boring-tool pierced the red

sandstone, and at a depth of about 1,250 ft. from the surface, touched a limestone containing fossils, which latter, however, have not yet been identified, as the remains are in a very fragmentary condition. The limestone is crystalline in texture, and may belong either to the Carboniferous or Silurian systems. We learn that the boring has now ceased. It may be noticed that the expense of continuing the sinking during the last week of the work, was entirely borne by the contractors, Messrs Doewra & Son, and the public are much indebted to this firm for their praiseworthy attempt to solve an interesting practical problem.

A "SHEFFIELD and South Yorkshire Navigation Bill" has been prepared for promotion in Parliament, the object of which is to obtain powers to connect Sheffield with the Humber by means of a ship canal. It is intended to make a dock of from twenty to twenty-five acres in extent at the east end of Sheffield; thence to make the canal follow the Don, past the Attercliffe Forge, and by Carbrook, whence a cut will be made to Messrs. William Jessop & Son's weir at Brightside. A nearly straight line will take the canal to Tinsley, where it will connect with the River Don Navigation, which was constructed in 1819. This old waterway will be used to Stainforth, whence the Stainforth and Keadby Canal will be followed to the Trent and Humber. A dock of about eight acres in extent will be made at Keadby. The average depth of the canal will be 13 ft. or 14 ft., and its width 80 ft. It will be available for steamers of 500 tons, and the cost is estimated at 1,000,000. The idea is to make a beginning on the lines of this scheme, leaving the question of enlargement and expansion to be settled in the future.

THE Statute of Frauds is one of those ancient yet evergreen Acts of Parliament which too often does more injustice than justice. The latest case upon it,—that of *Lavery v. Pursell* (Law Reports, 29 Ch. D., p. 508),—is, we are afraid, not a decision which will commend itself to the commonsense of the world. There was a sale of "building materials," which were at the time of the sale an existing house, though this, of course, was sold to be pulled down. The buyer at the sale signed a memorandum, and the auctioneer added, also in writing, "As auctioneer I confirm this sale on behalf of the vendor." A portion of the purchase-money was paid to the auctioneer. The vendor refused to fulfil his contract. The layman will be surprised to find that the purchaser had no legal remedy against the vendor, because the judge held that there was a sale of "a tenement or hereditament," and so the case was within the Fourth Section of the Statute of Frauds, which requires some memorandum in writing signed by the person to be charged, or by some person lawfully authorised by him. A mass of legal decisions clearly shows that the memorandum by the auctioneer was not sufficient, but this is the first time that it has been judicially decided that such a sale as this is a sale of a tenement. The reasonable construction is that it was the sale of a quantity of bricks, &c., which happened to be in the form of a house. We hope this judgment will be overruled by the Court of Appeal, for it is not one which can commend itself to laymen or broad-minded lawyers.

THE first issue of the new series of "Wiener Vorlegeblätter" has just appeared. The primary object of this very important publication is, as its name indicates, to provide material for archeological study and practice for University students. The "Vorlegeblätter" have, however, won for themselves a much wider public, and their issue from year to year is now eagerly looked for by archaeologists in all parts of Europe. The new series falls into three divisions. One part is devoted, to our sincere regret, to a reproduction of all the hypothetical restorations of the Illupersis of Polygnotos which have been made by modern classical scholars.

We confess this seems to us so much space wasted. Another part contains a series of representations of ancient Greek weddings, from vases and reliefs. The third (first in order) is by far the most important. It contains the beginning of a "Corpus" of signed vases. Several of these have appeared before, but are now for the first time published with the careful accuracy attainable by mechanical processes of reproduction. Such a "Corpus" is the necessary complement to a book like Klein's "Meistersignaturen," and Dr. Bendorff is to be congratulated on his new enterprise. The "Vorlegeblätter" for 1889 contains besides the small but important groups of Corinthian and Boeotian signed vases, an entirely new drawing of the François vase, and the nine vases signed by Exekias.

WHILST we are on the subject of signed vases, we must note that M. Edmond Pottier publishes in the last issue of the *Gazette Archéologique* (1888, 7 and 8) a very valuable supplement to the "Meistersignaturen." In such a work a number of omissions and inaccuracies were inevitable; the material is scattered over the whole of Europe, and many of the statements were of necessity second-hand. It is the obvious duty of the director of each separate museum to correct and supplement such statements. This for the Louvre and for the Ravestein Museum at Brussels M. Pottier has done, and further, he has revised the whole bibliography of the subject. The Louvre Museum, well-known as it is, is still "une riche mine de documents inédits," and must remain so till the appearance of the official catalogue render its contents accessible to archaeologists at a distance. The value of M. Pottier's work will be seen from the simple fact that, though the second edition of Dr. Klein's book is only out a year, M. Pottier can add the names of six artists wholly unknown, and twenty-seven vases by artists whose names are already known. So rapid is the growth of archeological material.

MAUCLERC'S Fire Extinguisher is described in the recent volume of the Proceedings of the Institution of Civil Engineers. It is an application of the well-known system by which the compression of carbonic acid is utilised for causing the violent projection of a jet of water charged with that gas. The objection, in many apparatus of this description, is a want of readiness at the moment required for action, whilst special portions are concealed and difficult of inspection. In the Mauleuc apparatus there is a reservoir filled with water, holding bicarbonate of soda in solution. In a special receptacle or vase placed above the reservoir, and open to inspection, is a solution of tartaric acid. This receptacle is closed by a screw plug, and when the apparatus is to be used the plug is unscrewed, and the vase is inverted and screwed into the top of the reservoir. The acid falls into the solution of bicarbonate of soda, and by reaction carbonic acid is rapidly disengaged, when the water is discharged under a pressure of six atmospheres. The discharge-pipe reaches nearly to the bottom of the reservoir, and the water is ejected through it in the manner of a syphon. The nozzle is connected by means of an india-rubber hose to the discharge-pipe. The apparatus is said to have been well tested, and is employed in many factories and public works.

WE are pleased to see that the Honorary Freedom and Livery of the Worshipful Company of Turners of London have been conferred upon Mr. David Kirkaldy, M. Inst. C.E., and Member of the Institute of Engineers and Shipbuilders in Scotland, "in recognition of his valuable services to metallurgists, turners, and all branches of engineering by his system of machinery and inventions for testing the strength and other properties of every variety of material used in the constructive arts." The *City Press* of the 8th inst. contains a full report of the proceedings at the presentation. Mr. Holtzappel, in introducing Mr. Kirkaldy to the meeting, said that Mr. Kirkaldy was trained as a prac-



cial engineer and shipbuilder. Mr. Holtzappel continued:—

"After some years he found his way into one of the largest and best-known Scotch houses—that of Messrs. Napier. Mr. Kirkaldy, who was engaged for many years in the drawing-office, where were designed the machines and ships produced by the firm, executed about the year 1860 a mechanical drawing which was the best he (the speaker) had ever seen. That drawing, which represented the steamship *Peria*, was on exhibition in the room that I visited. While employed as a shipbuilder, Mr. Kirkaldy made a discovery which, when finally perfected, led him in the temple of fame to a niche from which he would never be displaced. Up to the time that Mr. Kirkaldy made the discovery no machine existed by which could be ascertained the true strength of the various materials used in the mechanical arts. In consequence of this lacuna had in time past frequently occurred, because engineers were unable to ascertain whether or no there were any flaws in the materials they made use of for their various works. Had the invention been made use of earlier, he (the speaker) fully believed the terrible disaster that occurred at the Tay Bridge, which has been so often mentioned, that day was not likely, they would imagine, to make mistakes, and so it proved, for he understood that the machine worked from the first with perfect satisfaction, not even a single half-crown having to be paid for alterations. The machine completed, Mr. Kirkaldy, who was doubtless well known to the leading members of the profession, sat down to wait the course of events. Within a fortnight came the first client, who, as it happened, was not an Englishman, but Herr Krupp, the celebrated steel maker. The connexion thus commenced had never since been severed, the firm of Krupp still sending almost monthly pieces of steel, &c., to be tested by Mr. Kirkaldy. Gradually the invention became known, it being at the present moment universally recognised as the only machine of the kind that was capable of ascertaining with the most minute exactitude the strength of materials like iron and steel."

Mr. Holtzappel further at great length expatiated upon the character of the work that the machine was capable of performing. In conclusion, after enlarging on the kindness that characterised Mr. Kirkaldy's action to all his employes, most of whom had been with him from the very commencement, Mr. Holtzappel extended to Mr. Kirkaldy the "right-hand of fellowship," expressing the hope that he might long live to enjoy health, wealth, and prosperity,—a hope which we trust may be fully realised.

THE Paris Centennial Exhibition will be the focus to which myriads of sight-seers will gather next year. Some of our large employers of labour might do well to follow the initiative of Mr. Quintin Hogg, of the Regent-street Polytechnic Young Men's Christian Institute. That gentleman has made arrangements by which 600 of the members of the Polytechnic are to have a week's holiday in Paris at the very low cost of 2*l.* 10*s.* a head only, including travelling expenses, board, and lodging. They are to leave in parties of thirty, conducted by Mr. Hogg, or other gentlemen connected with the Institute, beginning on June 1, and ending with September. They will go for a definite purpose, the youths of various trades being comprised in separate groups, to study in detail the illustrations of handicraft in the Exhibition. It is intended to spend one half the time in this manner, and the other half in seeing the sights of Paris. Accommodation will be provided at Washington House, in the Rue de Milan, near the St. Lazare Station. Weekly subscriptions of 2*s.* each will be received from the young men until the necessary amount is realised. Members of the Young Women's Institute are to have similar advantages. We have no

doubt that there are many thousands of our working people, both in town and country, who would be only too glad to avail themselves of an opportunity such as this, and who would be ready to subscribe their 2*s.* or 2*s.* 6*d.* per week to that end. Certainly employers of labour have as good opportunities for making favourable arrangements for parties of excursionists as Mr. Hogg, and it ought to be to their ultimate advantage to do so. Our working men are often told that they are being beaten in handicraft by foreigners. A fitting opportunity now offers of enabling them to see and judge for themselves of the truth or error of these statements.

IT is to be hoped that the attention of artists and amateurs who visited the Art Congress at Liverpool last week was directed to the admirable Museum of Casts of Architectural Ornament, chiefly of the best period of the Renaissance, which has rather recently been formed in one of the large lower rooms of the Walker Art Gallery. The casts represent French work, including a few examples of Gothic, but mostly Renaissance. The scheme was suggested by the Museum of Comparative Sculpture at the Trocadero, in Paris, and the collection has been made chiefly with the view of enabling artisans who are unable to travel to study the style and modelling of some of the best examples of architectural sculpture of this school. The idea of instituting such a gallery originated, we believe, with Mr. P. H. Rathbone, who has done so much to stir up artistic study and sympathy in Liverpool, and to whom, indeed, along with Prof. Conway, the formation of the National Art Association is mainly to be attributed. Mr. Dyall, the Curator of the Walker Art Gallery, takes great interest in this branch of the establishment, which is exceedingly well arranged and cared for. Of course it only represents one school of architectural sculpture, and leaves room for wide extension if ever space and funds permit of this; but it is an admirable beginning.

THE exhibition of students' work in the galleries of the Royal Academy was, this year, rather a disappointment. We must suppose that students who feel strong enough, or are ambitious, are reserving their best energies for the more important competitions next year, and that this fact accounts for the almost dead level of mediocrity in this year's work. In the architectural section, the disappointment is greatest. It is disheartening to find that there were but two competitors for the Travelling Studentship, and one for the perspective prize, that the second medal for drawing was not awarded, and that it is difficult to pick out more than two or three of the designs submitted for the school prizes that show any promise, or rise above the level of commonplace. Of the architectural prizes, that for perspective drawing was the best deserved; the setting-out was correct, and the drawing deserving of the highest praise; the subject, too, the semicircular porch of St. Paul's Cathedral, was a difficult one, and makes success the more creditable. The drawings of Greenwich Hospital, which earned the silver medal, were neat and clear, and the design for a fountain, which was awarded the Travelling Studentship, was correct in detail and prettily drawn, though we cannot praise either the beauty or originality of the design. The competition for the prize for a decorative painting was a strong one, and earned the special notice of the President. The successful design is undoubtedly a fine conception, and its success was inevitable on account of its great merits as a design for a picture, but as a piece of decoration it is difficult to imagine how or where it could be successfully applied. Decoration demands a simple scheme of colour, strongly defined and well balanced if not rather equally distributed, but the design in question is divided sharply into a dark and a bright side, and the colouring is rather misty and indefinite. The complete list of prize winners will be found in another column.

TO complete the Montrose Memorial, in St. Giles's Cathedral, Edinburgh, a stained-glass window has been fixed in the chapel where the monument designed by Dr. Rowand Anderson is placed. The window is from the atelier of Messrs. Ballantyne & Sons, who have been assisted in designing and arranging it by Sir Noel Paton and Dr. George Burnett, Lyon King of Arms. The window consists of three lights, with Flamboyant tracery, and the design of the glass is entirely heraldic, consisting of upwards of thirty coats of arms, which have been arranged with a view to artistic effect rather than order of precedence. The blazonries are brought out in a rich and effective manner upon a ground of white glass, and the window is in good keeping with the richly-coloured material and detail of the monument itself.

AMONG incidents of the Liverpool Art Congress, we may refer to Mr. Gilbert's generous and almost pathetic protest against the treatment which another sculptor, Mr. Stirling Lee, has received at the hands of the Liverpool Corporation, in the contemptuous withdrawal of the commission to carve the exterior panels of St. George's Hall, and the absurd criticism with which the one panel he was permitted to execute was visited locally. We have referred to this matter, little creditable to the taste and culture of official Liverpool, more than once; and from the effusion of sympathetic applause with which Mr. Gilbert's remarks were greeted by an audience of which the majority were probably Liverpool people, it would seem that there is, at any rate, a pretty strong local feeling on the subject in some quarters. The palpably unfinished condition of Elmes's world-famed building, after all these years (which might have given point so far, at least, to Mr. Simonds's complaint about modern buildings looking "as if they were stopped short for want of funds"), is such a discredit to Liverpool that the Art Congress ought to have been made the occasion to obtain from the town a definite undertaking to complete its sculptural decoration, for the sake of English art generally. An incident which caused some amusement was the attempt of one of the audience to get up almost a personal quarrel over Mr. Brett's paper, the incisive style of which seemed to have been too much for his nerves. "We are not here to joke," he began fiercely; but Mr. Brett disclaims any idea of having intended to joke, and the chairman cut short the demonstration. The close attention with which a large audience of working men listened to an hour and a half's evening lecture on architecture, from one of the members of the architectural section, spoke much for their interest in the subject, and desire to know more about it, more especially as the greater part of the lecture consisted of an exposition of the constructive basis of architecture by means of diagrams, and only a few pictorial views were introduced towards the close of the lecture to carry the illustration of the diagrams a step further. The working-men showed more intelligence as listeners than the more educated members of the Congress on the previous evening, who were offered at a *soirée* in St. George's Hall a splendid programme of organ music, annotated with critical remarks, and played on perhaps the finest instrument in England by a player who, as an artistic executant on the instrument, probably stands alone in Europe. One might have thought an Art Congress was the place where, if anywhere, a high-class performance of this kind would have been listened to with respectful attention; but the Art Congressists showed their appreciation by promenading and talking nearly the whole time, thus unconsciously illustrating one of the most pointed sarcasms of the President in his opening address. The Socialist element was strongly represented at the Congress by one group of artists (or do they prefer to be called "craftsmen"?); it was suggested, indeed, that the unusual intimation, "evening dress," on the cards issued for an evening gathering at the private house of a well-known local virtuoso, was intended as a hint to Socialist artists who were supposed not to possess dress-coats.



## WANSTEAD MANOR AND PARK, ESSEX.

AMONG houses that are shortly to be put up for sale is a large, solidly-built house, having a fine old garden, in the High-street, Wanstead, which has long been known by name of Manor House. Yet it is generally believed that the original Manor House was that called the Naked Hall Haugh, whose site was taken for the later Wanstead House, as built by Lord Rich, and subsequently enlarged by Robert Dudley, Earl of Leicester.

This Manor, lying in Becontree, or Beventree Hundred, is said by some to derive its name from wan, and stede, the white house; by others, from stede and Woden, the house or stronghold of that deity. However this may be, we know that Edward the Confessor confirmed a grant by Alfrio of the land, valued at 40s., to Westminster, and that in that king's reign it passed by some means—perhaps in exchange—to St. Paul's. At the making of William I.'s Survey, the Manor was held by one Ralph Fitzbrian of the Bishop of London. In the thirteenth century we find it in possession of the Hoding family, from whom it passed to William de Huntercombe by marriage with Alice, daughter and heir to Sir Hugh de Huntercombe. In the old church, dedicated to Mary the Virgin, was a brass of Sir John de Huntercombe, lord of the manor, who died in 1368. During Henry VIII.'s reign this manor belonged to Sir John Heron. His son, Giles, husband to a daughter of Sir Thomas More, suffered for recusancy, and his property became forfeit to the Crown. Edward VI. bestowed it, 1549, upon Robert, Lord Rich, whose son sold the house—newly rebuilt and lands to Robert, Earl of Leicester, in 1577. Here that nobleman gave a right royal entertainment to his queen, in 1578; the festivities extended over four or five days, and were signalled by a masque, "The Queen of May," from the pen and invention of the author of "Arcadia." This was not Elizabeth's first visit to Wanstead House; for she had repaired thither to offer her politic felicitations to her sister Mary upon the succession of the latter to the throne. A view of the mansion as it appeared at that time forms the background to the portrait of Queen Elizabeth, preserved at Welbeck, and a little print was engraved of it by Stent in 1649. At Dudley's death his affairs were found to be much embarrassed. An inventory exists that was made of his goods and chattels. The list too lengthy for reproduction here—well illustrates what was the household *entourage* of a person of quality in those days—the names of the stud-horses being all succinctly set forth. To his wife, Lettice, widow of Walter Devereux, Earl of Essex, he bequeathed Wanstead Manor, together with various estates in the same county, at Leyton, Woodford, Great Ilford, and Walthamstow. These the widow brought in marriage to Sir Christopher Blount. We read of the Manor next as being owned by George, Marquis of Buckingham. He, in 1619, sells it to Sir William Mildmay. Some successive events may be best summarised by quoting an entry in "Peppy's Diary" of date, May 14, 1665: "To church, it being Whit-Sunday; my wife very fine in a new yellow bird's-eye hood, as the fashion is now. I took a coach, and to Wenstead, the house where Sir H. Mildmay died, and now Sir Robert Brookes\* lives, having bought it of the Duke of York, it being forfeited to him: a fine seat but an old-fashioned house, and being not full of people, looks flatly." Again, under date April 17, 1667, Peppy writes: "Some talk of Sir W. Pen's being to buy Wanstead House of Sir Robert Brookes." This purchase by the Admiral Penn, father to the founder of Pennsylvania, does not seem to have been accomplished. Five years after this the house was bought by Sir Josiah Child, the banker at Temple Bar, and originally a merchant's apprentice. Evelyn records how on March 16, 1683 he "went to see Sir Josiah Child's prodigious cost in planting walnut trees about his seat, and making fish-ponds [fed by the Roding] many miles in circuit, in Epping Forest, in a barren spot, as oftentimes these suddenly mowed men for the most seat themselves." He then goes on to say that he "din'd at Mr. Houlston's, a rich and gentle French merchant, who was building a house in the Forest." We should state that on forfeiture by Sir Henry Mildmay, who had officiated as a Judge at King Charles I.'s trial, the Manor was given by Charles II. to his

brother James, who sold it, as Peppy tell us, to Sir Robert Brookes.

Sir Josiah Child died in 1699, and was buried beneath a large monument in the old church. His son and heir, Richard, was elevated Viscount Castlemaine in 1718, and in 1732 was advanced Earl Tylney. He laid out the grounds as a park, and employed Colin Campbell to rebuild the house upon so magnificent a scale that, had the entire design been perfected, Wanstead House had been without a parallel in all Europe. The wings were never added; the main building, of Portland stone, was 260 ft. long by 70 ft. deep, Portland stone, was 260 ft. long by 70 ft. deep, of two storeys and an attic floor. The central portion was fronted by a hexastyle Classic pediment\* approached by two ranges of steps against the rustic basement. A good view of the front elevation, together with a detailed description of the various apartments, will be found in the "Ambulator," 1820, and another account in the ordinary text-books quoted from Young's "Six Weeks' Tour." See also the elevation, section, &c., published in the "Vitruvius Britannicus." Kent did some of the decorative work, and painted the Great Hall ceiling.

On the death of the second Earl Tylney *s.p.* in 1782, this property devolved upon Sir James Tylney-Long, Bart., of Draycott, Wiltshire, who was son to Sir Richard Long, by Emma, daughter of Richard, Earl Tylney. Sir James rebuilt the parish church in the Classic style, in 1789-90. He died in 1794 leaving a son, James, who did not attain to majority. Thus Katharine, the sister of James, the infant, became the wealthy heiress of Wanstead. Sought by many suitors, she gave her hand and fee—the latter said to amount to 75,000*l.*—to the Honourable William Pole-Wellesley, on March 14, 1812, who thereupon took the surname, commemorated in the first of the "Rejected Addresses," of Pole-Tylney-Long-Wellesley.† During Miss Long's minority, the house had been occupied by Louis XVIII., the Prince de Condé, with other members of the house of Bourbon. She died, under distressing circumstances, and quite broken-hearted, on Sept. 12, 1825; twenty years later her husband succeeded to his father, Richard, in the Earldom of Mornington and minor honours of his house. He died July 1, 1857, and was succeeded by his son. Owing to his reckless extravagance, Wanstead was put up for sale. No purchaser being found for the mansion in its entirety, the materials were sold in lots. The sale lasted during thirty-two days, realising, at the hands of George Robbins, auctioneer, a total sum of 41,000*l.* This was in 1822; in 1851 the family portraits and other pictures (*vide the Ambulator*, appendix) were sold at Christie's. The Manor passed to Lord Cowley, a descendant of Henry, fifth son of Garrett, second Baron, and (Oct. 20, 1760,) first Earl of Mornington. In the Park had been set up the Strand Maypole, which Newton bought and presented to his friend Dr. Pound for his big telescope.

Of this house,—whereof the four state bed-chambers, with their separate suites of rooms, and the hall-room, excelled anything of the kind at even Houghton and Holkham, Wilton and Blenheim,—nothing was left but some few out-offices and the plan of the cellars, which can yet be traced in the depressed turf. A groto that was constructed, at a vast expense, by the unhappy heiress, was totally destroyed by fire on the morning of Nov. 21, 1884. The still beautiful park, albeit most of the timber was sold, had been acquired by the Corporation of London. Its 182 acres (thirty being ornamental water), lying between Epping Forest and the northern portion of Wanstead Flats, were opened to the public by the Epping Forest Committee on Aug. 1, 1882. Lord Cowley conveyed the park to the Corporation in exchange for 8,000*l.* and three parcels of land, fifty acres in all, situated at Wanstead (ten acres), and in the Flats (forty acres). His lordship also engaged to fence the new public ground, and to make a road thereto giving access from Leytonstone and Forest Gate Station. Tom Hood wrote his novel, "Tylney Hall," when living (1832-5) at Lake, or Russian, House, an old summer-house, in the Park.

## Architectural Partnership, Glasgow.

Mr. John Honeyman informs us that he has assumed as partner Mr. John Keppie, who was principal assistant to the late Mr. James Sellars. The "style" of the firm will be "John Honeyman & Keppie."

\* This entire order came from Canons, after the sale of 1747.

† "Bless every man possessed of aught to give; Long may Long-Tylney-Wellesley-Long-Pole live."

## UTILITARIAN UGLINESS IN TOWNS.\*

BY PROFESSOR AITCHISON, A.R.A.

THE causes that produce Fine Art Epochs are at present shrouded in mystery, though there are certain conditions which must exist when these epochs occur. There are, too, certain conditions that preclude the existence of the visual Fine Arts. To begin with these last. It is evident that a people whose whole time is expended in extorting the barest means of subsistence from the soil is not in a position to cultivate them. A state continually overrun by savages or barbarians is in a similar position. A civil war, or an exhaustive struggle for independence against a powerful enemy, so engrosses the attention of the nation, and so exhausts its energies and resources, that it has neither time, means, nor inclination to cultivate the amenities of life. Even in reading of such struggles we cannot stop, but pursue the narrative to the end in breathless expectancy. But there may be mental conditions quite as powerful to prevent any such epoch arising. For instance, a national obtuseness to beauty, or a puritanical objection to it, and amongst people called civilised, a grovelling spirit which only seeks pleasure in the gratification of the appetites.

I think we may now say that some of the conditions necessary to the success of the visual Fine Arts are, accumulated wealth, comparative peace, a keen sense of beauty, a desire to see the beauties of nature or those deduced from them represented, a desire to commemorate a great victory or to mark a new sense of power, to evince gratitude to some unseen being for success or preservation from peril, and to render one's country illustrious. There is, too, a much lower motive, though one perhaps as powerful as all the rest,—the belief that the possession of masterpieces of the visual Fine Arts will give distinction, power, or wealth to their possessors, be these nations, societies, or individuals.

When the European Greeks found their training of the body and the practice of their creed, *i.e.* the acquirement of wisdom, courage, temperance, and justice, had enabled them to conquer the Persians, all the visual Fine Arts rapidly attained perfection. The spoils of the Persians and the contributions of Greece were devoted to raising temples to their tutelary deities.

When the Roman peace was established, after the battle of Actium, and the arts of Greece had been transferred to Rome, another Fine Art Epoch began, infinitely lower, it is true, but good enough to set the world agape ever since. Virgil, in the following passage, acknowledges the inferiority of the Romans to the Greeks in the arts and sciences:—

"Others, belike, with happier grace  
From bronze or stone shall call the face,  
Plead doubtful causes, map the skies,  
And tell when planets set or rise;  
But Roman, thou, do thou control  
The nations far and wide:  
Be this thy genius, to impose  
The rule of peace on vanquished foes,  
Show pity to the humbled soul,  
And crush the sons of pride."<sup>†</sup>

While the Greeks had achieved both peace and independence by the conquest of the Persians, the Romans, in conquering the world, had lost their independence. One object of the Greek cities, in erecting monuments, was to celebrate valour and to stimulate virtue, while the Roman emperors merely sought to gild the chains of slavery. Similar epochs occurred when the Mussulmans had conquered Asia and Africa, when Christendom had settled down and had overthrown the Moslems in Palestine, and, lastly, when Italy had thrown off Mediaeval fetters.

It may be asked why England did not record in a similar way the independence she had preserved after the Napoleonic wars? The long war had exhausted her resources, and the puritanical spirit under the form of Methodism was averse to display, and dead to beauty.

It is, perhaps, not extraordinary that so little attention has been paid to the Fine Arts in England until lately, because the discovery of some of Nature's laws, and the application of those laws to machinery, have created a state of things that never existed before.

In certain respects this last century differs more from the age preceding it, than that differed from the stone age. We have almost annihilated time and space as regards travelling, the conveyance of merchandise, and verbal intercourse. We have invented machines whose

\* Lord of this Manor, 1682-7: and M.P. for Aldborough. From a letter in the Peppian MSS. it appears he was drowned in the Rhone, at Lyons.

\* An address delivered by Professor Aitchison, as President of the Architectural Section of the National Art Congress at Liverpool.

† *Æneid of Virgil*, Book vi., Conington's translation. Longmans, 1870.



delicate action rivals that of the human fingers, and have found out substances whose power resembles that of the earthquake. We are enabled to manufacture things that all need with a rapidity and in an abundance that can only be paralleled in the fairy stories of our youth.

The population and wealth of this country, and of all the civilised ones that have benefited by our inventions, have increased in a marvellous degree; and this increase would be still more marvellous, if it had not been reduced by foolish wars, for I call those wars foolish that are due to jealousy or ambition. Those of us who can remember the finding of gold in America and Australia, know the mad rush that was made for it by so many, in the hopes of becoming rich beyond the dreams of avarice; even without the find of gold, the rush for wealth and power made possible by scientific discoveries, caused an oblivion of every other consideration, just as in one of the battles of antiquity the throes of an earthquake passed unnoticed in the fierceness of the strife.

Nature points out to us that the one harmless and gratuitous delight she offers is beauty; but mankind were in much too great haste to amass wealth, and to enjoy what wealth can purchase, to care for beauty, which requires an attuning of the mind to enjoy it. Banks of earth were thrown up for railways, gigantic ditches were cut for canals, rude bridges and ruder store-houses were made in hot haste, and machinery accustomed us to the sight of every form of exquisite ugliness. A new and plausible panacea was also invented, free competition in price. Through it we enjoy many needless luxuries at less than their proper cost, at the expense of the livelong misery of thousands of our fellow countrymen, whose condition is such that negro slavery appears by comparison to be a paradise. By it, too, good workmanship is fast becoming a tradition in too many industries. Latterly England may be said to have grown rich by the production and carting of rubbish. This generation has begun to pause in the race, to survey its heaps of gold, to see the disorganisation of society, and to ask itself how society can be reorganised, and how wealth can be nobly spent and nobly enjoyed. Nothing analogous to this vast accession of wealth has occurred since the Roman Republic became masters of the wealth of a good part of the civilised, and no inconsiderable part of the uncivilised, world.

Fortunately, Christendom was not so brutal and ferocious as the Roman Republic, and, badly as Christendom has used its wealth, it has not been wholly devoted to the most bestial self-indulgence, to pure idleness, and to butchery for diversion. It is for the philosopher and the statesman to reorganise society, to make the modest task of pointing out how some overlooked beauties may be enjoyed, and how some of the accumulated wealth of this country may be spent, so as to give pleasure and enjoyment to the people, and glory to the country.

Architecture is a threefold art; its forked root planted humbly in the ground, while its trunk stretches to the heavens. By the root, I mean what is founded on bare necessity,—the mere plan and the building, with which, however, the higher part is inseparably connected as the mind with the body. By the trunk, I mean all that is done to produce lofty emotions, without which it remains mere building or engineering. I do not wish you to suppose that I am not an ardent admirer of good building,—that I do not marvel at some of the feats of engineering, and am proud of them; but they only appeal to the intellectual and not to the emotional side of man.

There are only two sections of mankind that are content to exist without architecture: the lowest savages, and those who are in most respects the most highly civilised. The former are contented with the caves or lairs of wild beasts; while the latter only ask for buildings that meet their more complex physical wants, but destitute of everything that appeals to their higher nature. The poor savage grovels from necessity, his mind is obtuse and unopened from the difficulty of getting enough to support life; while the civilised man grovels from choice—he has wilfully thrown aside or trampled out the higher desires. The object of this lecture is to try and lift him from this state. Nature shows us that she can make everything fitted to its end, and most things beautiful; for when she does make loathsome insects, reptiles, or fishes, it is possibly to scare their prey. Certain tracts of country, too,—particularly in the neighbourhood of vol-

canoes,—are often repulsive enough, and possibly for this reason, that to live there would entail disease or death. Landscape, however, is mostly as beautiful as the grass, the flowers, the trees, the mountains, the waters, and the sky that make it up. I cannot believe that all the beauties of Nature have been spread merely for the enjoyment of insects and the lower animals. If it be meant for man's enjoyment and delight, we may be sure that we can neither overlook nor contravene Nature's directions without suffering for it. If our eyes and minds were attuned to appreciate beauty, we could not bear to have about us ugly things, nor to live in ugly houses. All but the lowest savages have every utensil beautiful, and their huts or wigwags are often beautiful, too.

Architecture is a threefold art. The building must be well arranged, the size of each room must be what is wanted, the lighting sufficient for the purpose, and the rooms so placed that they may be got at conveniently, or, as we architects say, it must be properly planned; the structure must be well built, should express its purpose, and it must be put together rhythmically if it is to be called architecture. A building so planned and built is what may be called reasonably good architecture, but it may be planned for grandeur, beauty, or sublimity; variety of shape may be given to the rooms, the lighting may be so arranged as to produce beauty or impressiveness, the parts may be made slender or massive, so as to produce higher emotions; the outside may be plain or ornamented, be smooth or full of contrasts of light and shade; its outline may be simple or varied, it may be high or low, it may soar in the air or stretch along the ground. Important parts may project or be recessed, be square, round, or polygonal; it may have towers, spires, and pinnacles, domes, or pyramids on its top; in short, it is open to infinite varieties of shapes; but if it is to be perfect, it must be enriched by the hand of the sculptor and the painter, for pure architecture does not deal with floral or animal forms,—nor with colour. And when I say the painter, I do not necessarily mean that the outside must be painted; but his aid is wanted in arranging the colours of the materials, or in designing the inlays or the mosaics.

Pure architecture, like music, may enthrall or entrance, but, like music, it is vague. As music wants words to make it definite, so does architecture want floral, animal, and human forms to enrich it, and to more exactly define its purpose. No perfect example of architecture exists in which sculpture and colour are not combined with it. Architecture and music are obtrusive arts. You cannot help seeing the one or hearing the other. In one respect architecture has the advantage; you may admire it in a desert, but without man or animals music almost ceases to exist, for who has heard the music of the spheres?

There are two kinds of architecture,—naked and clothed,—and in modern architecture this difference is mostly confined to the outside. The best Greek and Mediæval is naked. The late Roman and Byzantine, and sometimes the Saracenic, is clothed. In the first, the marble, stone, brick, or wood is an integral part of the structure; while in the latter the structure is first completed, and then clothed with marble, metal, mosaic, or plaster.

Before any expensive Fine Art can exist,—and architecture is a particularly expensive one, there must be stored wealth; but, as few Fine Arts are created for pure love,—the creation being mostly painful,—there must be those who keenly appreciate artistic productions, and are eager to reward the artists; in short, the excellence of all the Fine Arts depends on the relative cultivation of the amateur. Even in music, which is said to be, like virtue, its own reward, you would scarcely have accomplished musicians if all were deaf but themselves. You would scarcely have painting, sculpture, and architecture, if all but the artists were blind. You must pay the artist; he, like the rest of the world, must live by his labour, but besides his living he must have admiration and honour.

No one can doubt that the works of a great musical composer, and the execution of a brilliant musician, evoke intense admiration in the present day, and if the piece be sung, and the voice be both trained and exquisite, it evokes passionate enthusiasm, akin to adoration. Some admiration is accorded to the great painter, or the great sculptor, but who ever heard of admiration being bestowed on a great architect? his reward is mostly abuse, and, let me say, that the great architect is not necessarily he who builds many or colossal buildings,

but he who can produce the highest emotion, and satisfy the most refined taste; for though he who can affect the multitude must have merits, the most competent judges in successive ages eventually settle the standard of taste.

A great living French architect has said with only too much truth "the appearance of an architect, who has done anything, is a sign for the crowd to pelt him with stones, and if anyone wounds him, everyone applauds, without comprehending that the architect's injury is everyone's loss."

Thousands of people in this country make an excellent living, and often their fortunes, by being judges of one article,—calico, silk pocket-handkerchiefs, wine, or tea,—and yet every architect, from the highest to the lowest, must have a knowledge of what weight the soil will bear, of the qualities of stone, brick, and marble; of iron and steel, lead, zinc, and copper; of the various sorts of wood, tiles, slates, mortar and cements, and what they will bear; of certain mechanical contrivances; of the requisite size of rooms, and of their proper lighting, how they may be most conveniently entered and placed together. He must be able to draw, to calculate, and give clear directions, and he must put his building into a rhythmical shape, or you will deny him the title of architect. Yet he has been the butt of wits from Roman times to the present day. Martial advises a father to make a dull lad an architect; and too many have been delighted by the sairies on the architecture of Wren, Chambers, Wilkins, Soane, and Barry. All he has done well will be received with apathy, but woe betide him if a chimney smokes, a drain-pipe be stopped, or a panel cracks. He will scarce escape abuse if a window is too big or too little, or if, after the house be occupied, it should be found convenient to hang a door the other way.

Architecture is the music of the eye; it is founded on rules of harmonic proportion, just as music is, only in the latter art they appeal to the ear. If all music were indifferent to mankind, can we imagine that it would be cultivated to its present perfection? If everyone thought the music of a kettle at a dog's tail, of a hurdy-gurdy, a barrel-organ, or the most exquisite performance, were merely different kinds of objectional noises, do you imagine we should have such performers as Herr Joachim, Signor Piatti, or Sir C. Hallé, or would there be compositions of Palestrina, Handel, and Rossini? How do we treat this art of music? Half the population,—the fairer half,—are taught the principles and practice of music from their early years, partly, it is true, in the hopes of their becoming executants, but very many would be taught it to improve their faculties and taste in this direction, even were it known they could never execute it decently, and many of the other half study it. But who studies architecture? Who knows the notes, who has learned counter-point, that he may be able to follow the intricacies of harmony through a building? Whom does architecture raise into ecstasies? Yet I presume there are natures as capable of being enchanted by it as by music, if the same training were bestowed. It is undoubtedly the case, that some are as much enchanted by lovely colour as others are by sweet music.

The utmost effect of the best modern buildings on the bulk of mankind resembles the effect of the sermon on the Northern farmer:—"An' I never know'd whot a mian'd, but I thowt a 'ad 'ummut to say. An' I thowt a said whot a owt to 'a said, and I coomed away."

Do you imagine that the specially gifted of mankind will wear their lives away in producing this kind of beauty, if their highest achievements have no effect on their fellows?

The most elementary education of the public taste is wanting in our art, though no mere mechanical means can touch the soul. We should now teach a child to read, if we hoped he would become a great poet; but we should not think that he would necessarily become one if he could read, not even if he had read all the masterpieces of poetry. We should say that writing poetry was the gift of God; but we are too apt to forget that to produce we must not only have the gift, but we must have the proper surroundings; we must live in a noble age, as well as have passionate admirers. The highest poetry only emanates from gifted men, in an age of lofty thoughts and passionate emotions, and with an enthusiastic audience to be stirred by the poet's song. We can imagine the greatest poet who ever lived,



Homer, unable to read, but it is impossible to suppose that he lived when there were no noble deeds, lofty desires, and acute feelings. An age marked by the greed of gain and a desire for coarse pleasures has never produced any poet greater than a satirist. Our own age is marked by its greed of gain, and its love of banqueting, but it is redeemed by a taste for literature, some love of humanity, and a passion for scientific research. With these exceptions, we are very like the Romans of the Empire, though happily we are not so ferocious; but we lack their passion for the grand and dignified, and their sense in seeing that grand buildings marked their power, and would survive their decay. I once pointed out to one of our ministers that magnificent public buildings not only added to the grandeur of the country, but were a perennial source of revenue from our colonists, and the foreigners who flocked to see them, but he only said that the remark was far-fetched. Yet on what did Greece greatly subsist, when her glories had passed away, but on those who came to see her buildings and works of art. Italy, in a like manner, greatly subsisted on the visitors who came to see her buildings, until the time of her regeneration. It has been said, with some truth, that all that will mark the English way in India will be fragments of the willow-pattern plate and empty soda-water and champagne bottles.

If we are still to have great poets, great painters, great sculptors, great architects, and great musicians, the people must have inspirations as noble and taste as refined as those of the ages in which these arts flourished.

We do not get great oratory under a despotism, neither can you expect great emotions nor great aspirations out of people who grovel. If the main ambition of the age is simply to be rich, and its only aspiration is to enjoy what riches can buy, you cannot expect nobility to emerge from it. Turtle, whitebait, venison, and stuffed truffles, washed down with milk punch, champagne, old claret, and port, are excellent things occasionally, but if all our happiness is centred in them, what can be expected of us? The great object to be sought is not the philosopher's stone that will turn everything into gold, but that pearl of great price that will render us noble and lift us out of ourselves; religion, patriotism, or the love of humanity, seems to be the only ideal capable of effecting this. I speak but against what appears to me to be a growing tendency, for we can hardly imagine any one not echoing the hopes expressed in the Poet Laureate's song:

\* \* \* "To strive a happy strife,  
To war with jealousy to the knife,  
And not to lose the good of life."  
\* \* \*  
"At least, not rotting like a weed,  
But, having won some generous soul,  
Fruitful of further thought and deed."

Unless the accomplished figure-painter can see in his mind's eye the adoration of the Hosts of Heaven, human purity, beauty, or suffering, or the strife of nations for right and freedom, and paints them as his tribute to God or humanity, he will not touch us. Unless the musician hears heavenly harmonies and acts in a like manner, we shall not be enchanted; nor shall we be enchanted with buildings, unless the architect has pictured to himself solemn and mysterious naves for worship, dignified halls for science, magnificent buildings for the making of laws, or graceful homes for the people, and is animated by the same devotion.

Without a noble aim, all these Fine Arts will but exhibit the skillful achievement of soulless sounds or sights. In each art nations get the embodiment of what they are. If they are noble, and love architecture and study it, they get noble buildings; while, if they swagger and are pretentious, they get swaggering and pretentious buildings. It was pure nonsense to say that Gothic cathedrals were made by barbarians in imitation of their native forests, but it was by no means nonsense to suppose that this was the ideal form they strove after. The Tartars were struck with the clouds, and their transcripts of those clouds are always found in their embroidery. It is impossible for highly-gifted and cultured nations to have no ideals, no tendency towards some particular form and particular characteristic. They must prefer buildings that soar, or those which stretch along the ground; they must prefer simplicity or complexity, magnificence or exquisiteness, elegance or massiveness, plainness or embellishment. Every known phase of

\* "The Two Voices,"—Lord Tennyson.

architecture has been exhibited to this age, but at present nothing meets its approval, and it only grumbles out that it wants something new. It soon would have something new if any large section of the people had a marked preference for anything, for then all the architects would seek to improve on the chosen type. What is new means emergence or development from what exists; but if by newness is meant something that has never yet existed, you may as well look for a fourth condition of space.

The Greeks made music one of the elements of primary education, and though it did not exclude instrumental music and song, these only formed part of what it embraced. Every act that could be done gracefully, harmoniously, and rhythmically, was included under music; what was unmusical they considered brutal and barbaric, and unfit for a cultured people, and I want you all to feel this too.

When a house is but an aggregation of dog-kennels or rabbit-hutches, it is no proof of a cultivated taste,—though it is better to have houses of this sort, than to indulge in the present hypocrisy, to profess to like what you care not two straws about; if we are in the state of the lowest savage as regards architecture, we had better confess it rather than dally with Greek, Roman, Saracenic, Gothic, and Renaissance architecture, and care for none. If there is no love of ornament, leave it out. We should soon be ashamed of our own barbarity, and probably make some honest effort to improve our state; for we must have some real liking for beauty before our state can be improved. How utterly insensible we are to beauty of form is seen in men's clothes, which prevents us having anything worthy of the name of sculpture in the dress of the day.

That the art of architecture is not dead is because the architects present it gratuitously to their employers, for people will not pay for what is meant to be pleasurable if it gives them no pleasure. When architecture is loved it will be paid for, and architects will get as many pounds as they now do shillings. This has been the case with painting in my lifetime. The present parsimonious way of treating architects renders it impossible to get the most highly-finished work they can do, and workmen execute. Speaking roughly, it has prevented any serious attempt to make ironwork beautiful, though the universal prevalence of ironwork is the distinguishing characteristic of the day. One of the objects that this society was created for was to improve the Fine Arts, and those arts, which may also be fine, that are devoted to objects of common use, called, for some mysterious reason, "the industrial arts." The most practical suggestions I can make to you are to be noble, and to cultivate those powers and that taste with which you are endowed. To learn to admire the beauties of nature, and this cannot be done by listlessly staring; you must carefully examine and accurately remember the graceful proportions, the subtle curves, the enrichment of surfaces, the varieties of light and shade of a blade of grass, a leaf, a twig, or a flower. Try, too, to become as beautiful as you can yourselves. This is to be compassed by temperance, by exercise, by noble thoughts and high endeavours. The word temperance has been so abused by the water-drinkers that it means, in their mouths, abstinence from alcohol; but I use it in its proper sense. Look at the casts of the Greek athletes, of Phæbus Apollo, or the Venus of Milo, and see how near you can bring your bodies to resemble them. Too many men, after they are thirty, seem to take Silenus for their model. When you can appreciate the beauty of a blade of grass, of a twig, of the bole of a beech-tree, of a growing flower, or of a butterfly, you will have compassed much; and this study is greatly aided by the use of the pencil, the colour-box, and the lump of clay. When you find you are unable to copy the delicate curves, that you have the blade of grass on your paper, but without the grace, you will have much more delight in it, and much more respect for its subtlety. And the same will be the case with the light and shade and the colour. When you have succeeded in copying the grace you will be in a better position to judge if a moulding or a building be elegant or coarse. We admire a walk shaded by trees where the ground is dappled with sunshine and shadow; we are struck by a dark alley of trees with a sunny space at the end; we admire the graceful outlines of hills and peaks of mountains; it is the faculty of transferring some observed features of nature to our buildings that

makes them beautiful. Man's work, however, must always be judged by its relative excellence to the former work of man. There are laws of composition in music, architecture, sculpture, and painting,—for we call those principles laws which coexist in many works that have elicited the admiration of ages.

In certain respects artists are the only judges of artists' work; for instance, no one but a figure-painter can adequately appreciate the flesh tints of Titian; he has been all his life striving to do what Titian accomplished. When I look at the fine arts of former times, every age seems marked by the virtues and vices belonging to it, whether it be in its architecture, sculpture, or painting. The Normans, the Lombards, and the Franks seem to have been grand barbarians with high aspirations, full of invention, but with little skill; no one can be blind to the grandeur and impressiveness of their work. Nothing to me is grander than the Norman part of Durham Cathedral.

In Early Gothic the accession of skill and knowledge was enormous, and there was still a noble, though semi-barbaric, ideal; but gradually the exhibition of skill was more thought of than the artistic effect, so that it died at the first touch of the Renaissance; this, at least, may be said of its later development, that the knowledge of the capabilities of stone and the skill in using them has never been equalled. At the dawning of the Renaissance in Italy, the sculptor-architects had not only noble ideas, but a taste almost equal to that of the Athenians in their palmy days. The exquisiteness of proportion, the simplicity of effect, and the perfection of workmanship in their works are marvellous. I may mention two tombs by Mino da Fiesole, at the Badia at Florence, which are among the most perfect monuments that exist. They are shown in a valuable book of Italian tombs, published by the Arundel Society, in which you can trace the accession of grace gained by the study of the antique.

In Medieval days beyond war and music, architecture and its attendant arts were the only safe outlets for human thought; in every other direction the thinker was liable to imprisonment and torture, with a strong probability, too, of dying at the stake. When the Renaissance removed the shackles from thought, architecture again became but one of the directions in which it was turned.

As soon as the characteristics of the day were pretentiousness and vanity, every one of the fine arts rapidly deteriorated until they ended in contortion and inanity. Benvenuto Cellini was probably one of the most perfect masters of his craft that ever lived, but he was a swaggering ruffian, and was consequently much admired in his day, though his works are not to be compared with those of his immediate predecessors; the noble ideal had departed.

You know the indignant outburst of Horace in one of his songs, after noticing the curled, perfumed, pumiced, beruffled, and pampered dandies of the day:—

"Was it the spawn of such as these,  
That quelled the great Alcides?"

so when the ideal of the day was to swagger, to indulge in orgies, and to assassinate, all the good that could be expected or be found in the fine arts was from the continuance of tradition and greater skill of eye and hand.

In point of skill, the painters, sculptors, and architects of the day seem to me almost equal to any who have ever lived; but there is no high ideal in society to be expressed by them. I said there was no taste for architecture amongst the people, and this is perfectly true of the mass; but there are some who have a passion for architecture, and do build magnificently when they get a freehold; but, as a rule, all the land in London is entailed, and in the case of the best sites nothing but a lease is to be got; so, like the soldier crab, we are forced to crawl into an abandoned shell, for who will build magnificently for another to inherit, for whom he knows and cares nothing? We want the evils from which we suffer cured concurrently, we want a general taste for good architecture to arise, for architecture is a social expression; respect to be given to those who build magnificently, and the permission of holding vast tracts of land in towns to be abolished, at least if the metropolis and other towns are to vie in grandeur with those of antiquity and the Middle Ages. Some few years ago it was said that at Manchester alone a man retired every week with a million, and large fortunes must have been made in other towns



and in the colonies; yet in my lifetime how few magnificent houses have been built in London! Bridgewater House, Dorchester House, the Duke of Buccleuch's, and Mr. Hope's house are all that I can recollect.

You can no more have architects fit to carry out grand public buildings without the prospect of having them to do, nor have them perfected without the knowledge gained by such practice, than you can expect a man to be a great general nor the division of a battle knows more than a spinster." When Pericles was upbraided for adorning Athens with magnificent buildings, what did he say? "That as the State was provided with all the necessities of war, its superfluous wealth should be laid out on such works as, when executed, would be eternal monuments of its glory, and which, during their execution, would diffuse a universal plenty; for, as so many kinds of labour and such a variety of instruments and materials were requisite to these undertakings, every art would be exerted, every hand employed, almost the whole city would be in pay, and be at the same time both adorned and supported by itself."

You may say, Here was the first city of Greece, just elected to the leadership, under whose guidance the greatest power then on the earth had been foiled. Let us hear what the leaders of Florence said, a poor little mercantile town only just settled down. When the Cathedral of Sta. Reparata was to be rebuilt, the Florentines determined to dedicate the new one to "St. Mary of the Blossom," and have it executed in the most sumptuous way, so that it might surpass in splendour every building of the Greeks or Romans. To this end "they directed it to be so designed, that for grandeur and magnificence nothing greater nor more beautiful could be desired, as far as human skill and industry could go; and they ordered it to be incrustured with worked marble, externally, and have all the necessary cornices, pilasters, columns, reliefs of foliage, figures, and other things to make it perfect."

The Greeks, who were no mean judges of the human heart, contracted for their long walls, but built their temples by day-work, so that no one had an interest in doing work badly; that was solely executed to show their gratitude to the gods, and to minister to their own delight. When Cimabue painted his picture for Sta. Maria Novella, and the Florentines saw he had made the first step towards progress, they had the picture carried in solemn procession from the artist's house to the church, accompanied with trumpets and great festivity, and so joyous was the crowd that went to see his picture, with Charles I., of Anjou, that it is called the joyful suburb to this day (Borgo Allegri). Contrast with this the treatment of Alfred Stevens by the Government, the artist who has produced the finest monument of this century in England. He had worked on it for years, had found the sum allowed insufficient for the materials, and had supplemented it by giving all he could earn in his spare time. Eyrtton, who was then Edlie, would have put him in prison but for the general outcry, because he had spent all the money allotted without completing the monument. This is worse than a piece of Roman history.

Strange as it may seem, there are instances of architects being handsomely rewarded, though I must confess it was a long time ago. Not to speak of the magnificent treatment of Bernini by Louis XIV., Ahmed Ibn Touloun, the Governor of Egypt (A.D. 876), in the ninth century rewarded his Coptic architect with ten thousand pieces of gold and a pension for life when he had built the mosque of brick and plaster, as he was desired, though the mosque had only taken two or three years to build. An Italian artist said to me the other day in Rome, "They do not burn us now-a-days, they only let us die slowly of starvation."

To sum up what architecture does for us—it supplies that grace to our habitations and that dignity to our public buildings that should be as necessary to our life as the air we breathe; the inside of our houses should be so graceful in form and so beautiful in colour as to restore to us the requisite calmness of mind that strife with the world, or close application, has robbed us of. That the outside should be shapely and rhythmical is a debt we owe to the public, for by building our house we have deprived it of some light and air, and helped to poison the atmosphere with our smoke and exhalations,

and have probably destroyed some vegetation. If, in addition to these ills, we plant before it a hideous spectre we are doubly injurious.

As a nation we sink in the scale of civilisation if we have nothing to show in our towns and capital but utilitarian ugliness, and we shall have nothing to show of our former greatness, nor of the extent of our dominion, if we leave behind us no buildings worthy of admiration and study. I would here say something of the importance of building, with that excess of necessary strength, and with that permanence that will resist for centuries the ravages of time. The day may come when nothing but their inherent strength can preserve our buildings. Nothing strikes us more, nor gives us a higher ideal of former greatness, than the ruins of Egyptian, Greek, and Roman buildings.

We see by Roman work built of the very meanest material, rubble and concrete, that if buildings be properly constructed and vaulted, they will endure for long ages without a helping hand from man. The Roman buildings that have continued in use, and been cared for, are as good now as they were nearly two thousand years ago, and even those that have been uncared for would be still standing had they not been purposely destroyed.

The dumb nations would be clean swept from present knowledge had they not had illustrious architects and excellent builders. Were it not for its buildings, what should we know of Egypt? and had Rome perished before she had translated Greek literature, there would have been little but her aqueducts and fortresses to attest her greatness.

When once she had transferred Greek literature into her own tongue, absorbed Greek science and knowledge, and had not only transplanted Greek architecture but transformed it, she marked her sway, that extended from Anglesæ to the Tigris, and from Mogador to the Red Sea, with magnificent public buildings. From these buildings the Saracenic and Moslem styles took their rise, and even at this day we are directly indebted to the Roman architects; the thickness of the walls in the London Building Act is taken from the long walls of the Pæcile at Hadrian's Villa.

If you consider the blank that would be left in sculpture and painting by expunging the architecture, and in literature by the omission of all reference to it, you may realise its importance. So, surely, it claims a little more study and encouragement, and those whose lives have been spent in its pursuit should receive a little more consideration. Architecture can no more flourish than any other fine art if it be not loved and keenly appreciated. The rich and well-to-do might reflect that it is not a very perishable art, that a magnificent mansion or public building might keep alive their name for centuries, when it would otherwise pass away with the generation in which they lived. The great Agrippa, the real Emperor of Rome, had other titles to immortality besides his taste for architecture, but would every educated person know his name now if it were not associated with the finest of all Roman buildings, the Pantheon? We do not cherish the records of the Everlasting Club, the tons of meat, bread, and cheese, the hogsheads of beer, wine, and spirits consumed; and yet how many of those possessing large fortunes will have little more to be recorded of them than the amount of their fortune in a book of statistics and the useless quantities of meat and drink consumed, the useless and ugly clothes worn out, the useless men and maid servants, carriages, and horses they once employed.

I am here only to speak of architecture, but the indulgence in any elegant taste that confers a benefit on posterity helps to keep green a man's name. Who would now have heard of Grotier or Maloli if they had not indulged in elegantly-bound books. The Emperor Augustus had sense enough to see the benefits he conferred on his country by setting the example of building, and encouraging the rich to erect palaces, baths, basilicas, and temples, by giving countenance to them and promoting them to office. Even now, there is a pecuniary or social advantage in magnificent architecture and decoration. The London hotels and eating-houses vie with one another, at least in internal splendour. The elegant decoration of private houses certainly gives to the owners a celebrity they would not otherwise enjoy.

I would, however, rather insist on the public advantage as well as on the personal pleasure to be gained by the study and appreciation of noble architecture, even by those who can never afford to build, for their knowledge and appre-

ciation will encourage a higher and deeper professional study, and will reward its success. Though architects, like other men, must live, their highest reward is the admiration of those who are qualified to judge.

To those who can build, I would more insist on their getting nobler architecture, on the pleasure of seeing each new beauty added, of contemplating the perfect whole, and on the pleasure they give to thousands, than on any more worldly consideration. To further enlarge is needless, for, as Sir Henry Wotton says, "Architecture can need no commendation where there are noble men or noble minds."

#### ARCHITECTURAL SOCIETIES.

*Birmingham Architectural Association.*—A meeting of this Association was held at Queen's College on the 4th inst., the following, amongst others, being present:—Messrs. T. Naden, W. Doubleday, P. B. Peacock, W. H. Bidlake, W. H. Lloyd, H. Beck, T. W. F. Newton, and Herbert R. Lloyd. It was announced that special prizes were offered to the student members by Mr. Naden (president) and Mr. Doubleday (vice-president) for the best measured drawings of old buildings, and by Mr. Newton for the best design for a house. A paper written by Mr. Ponting, F.S.A., of Marlborough, was, in his absence, read by Mr. H. R. Lloyd. The writer gave a detailed account of Edington Church, Wilts, describing it as the first example of transition from the Decorated to the Perpendicular styles, and claiming for its designer, Bishop Edington, the merit of originating the latter style. The paper was illustrated by a number of excellent drawings of the church, and was followed by a short discussion and a hearty vote of thanks to the writer. The church was described and illustrated in the *Builder* for Aug. 20, 1887.

*Leeds and Yorkshire Architectural Society.*—The third ordinary meeting of the present session of the Leeds and Yorkshire Architectural Society took place at the Society's rooms in Infirmary-street on Monday evening, when Mr. J. Aldam Heaton gave a lecture on "Beauty in Colour and Form,—How to Seek; Where to Find." Mr. H. Perkin (President) occupied the chair, and there was a good attendance. On the proposition of Mr. Thorpe, seconded by Mr. Cribb, Mr. Heaton was accorded a vote of thanks for his lecture.

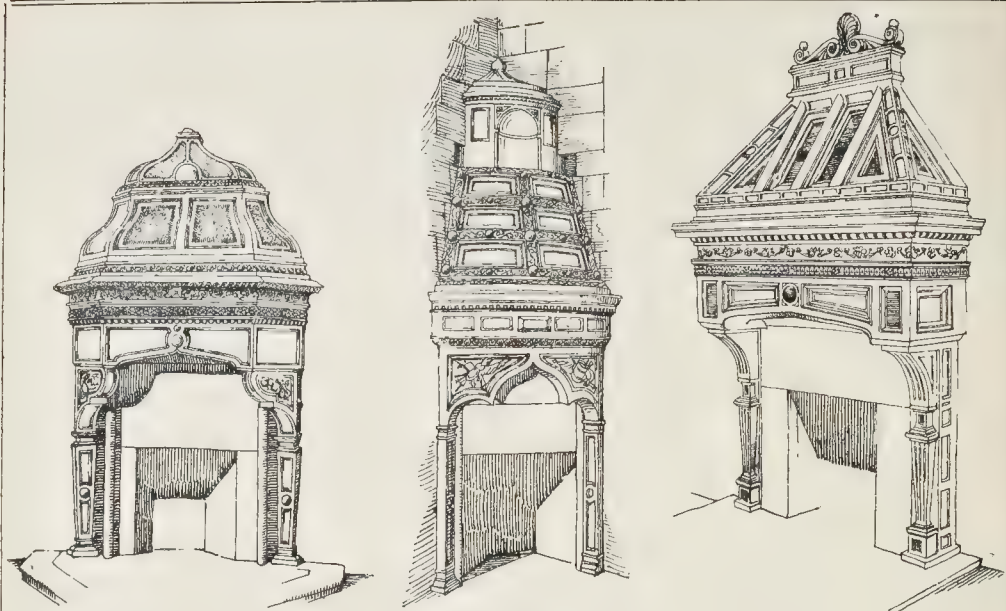
#### COMPETITIONS.

*Buxton Hydropathic Establishment.*—We are informed that the designs for the additions to the Buxton Hydropathic Establishment and Winter Residence, submitted in competition by Mr. William Dawes, architect, Manchester, have been accepted, and that the first premium has been awarded to them.

*New Offices for the Institute of Chartered Accountants.*—We are informed that at a meeting of the Council of the Institute of Chartered Accountants in England and Wales, held on Tuesday last, the designs for the erection of a hall and offices, submitted by six architects who had been invited to compete, were considered, with the assistance of Mr. Alfred Waterhouse, R.A. (who acted as assessor). The design submitted by Mr. John Belcher, F.R.I.B.A., were unanimously adopted, and Mr. Belcher was appointed the architect to erect the proposed building.

*Election of Borough Surveyor for Harrogate.*—At a special meeting of the Harrogate Town Council, on the 7th inst., presided over by the Mayor, the final selection of a successor to Mr. E. Wareham Harry, as Surveyor and Borough Engineer for Harrogate, took place. In response to advertisements inviting candidates for the post to send in their applications, no fewer than 181 responded. A meeting of the Council reduced this number to thirteen, a second meeting to seven, a third to three, and the special meeting on the 7th inst. was held to make the final selection. The voting between Mr. Stead, for nine years Assistant Surveyor for Bradford, and Mr. F. Bagshaw, of Harrogate, for some time past assistant to Mr. Harry in the Surveyor's office, Harrogate, was very close, and the result was as follows:—Stead, 12; Bagshaw, 11. Mr. Stead was, therefore, the successful candidate.





Fireplaces at Bolsover Castle.

## FIREPLACES AT BOLSOVER CASTLE.

THESE illustrate pleasantly the variety of fancy in the treatment of detail characteristic of these remains of a fine Renaissance mansion. They are drawn from photographs made at the time of one of the Architectural Association excursions by Mr. J. L. Robinson, of Dublin, who is well known to many members of the architectural profession as an amateur photographer of architectural subjects.

## Illustrations.

## BAYONNE CATHEDRAL.

THE Cathedral is almost the only building of interest in Bayonne. It was restored, and the western spires shown in the illustration were built, in 1875. Inside it is a fine church, partly of the thirteenth and partly of the fourteenth century. There are extensive cloisters of late date attached to the edifice, the chief beauty of which is the south-east entrance to the transept.

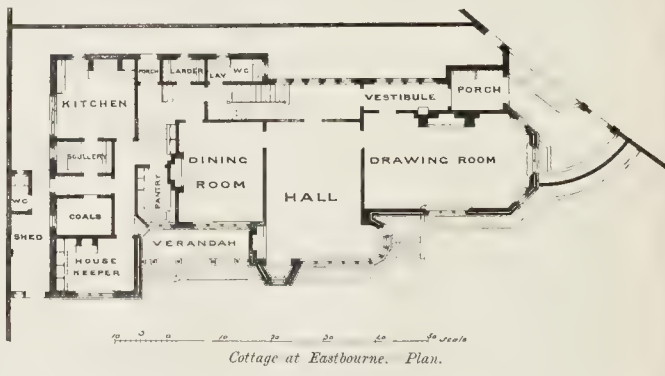
## HOUSE, RUE ST. ANDRÉ, ROUEN.

We have before published a sketch of this remarkably picturesque old house (*Builder*, Feb. 19, 1887); but, coming across a good photograph of it, we have thought it worth while to give it in a more realistic representation.

The comparison of the photograph and the sketch, by any one who takes the trouble to make it, will point a moral which we have urged before, as to the extreme difficulty of depending on a sketch for accuracy. Among the younger members of the profession there are few who enjoy a higher reputation as an architectural sketcher than the author of our former illustration, but it will be seen in the photograph that one characteristic point in the design is that the centre pilaster is much narrower than the side ones; in the sketch this has been overlooked. Mr. Mitchell, the author of the sketch, however, is in good company. Some time since we had occasion to give an illustration of a Spanish tower, from a photograph, with round-arched windows, which are all drawn pointed in an illustration of the same tower by no less a man than Street, in his work on Gothic architecture in Spain.

## CHURCH OF ST. THOMAS À-BECKETT, UPHOLLAND.

THE drawing shows a new chancel which was added a few years back to this very fine old church,—the only church in England, probably,



Cottage at Eastbourne. Plan.

dedicated in honour of St. Thomas à-Beckett, whose figure appears on the east gable. Owing to the fall of the ground, a basement could be obtained below the chancel, and this basement contains the hot-water apparatus and a large vestry. The communication between the vestry and the chancel is obtained by a spiral staircase. The work was executed by Mr. Winnard, of Wigan, from the designs of Mr. Basil Champneys, architect.

## UPTON PARK, SLOUGH.

Is a timbered house externally, with brick walls inside throughout.

Messrs. Williams, West, & Slade are the architects, and Mr. A. Bush is the builder.

## COTTAGE AT EASTBOURNE.

THIS has been built as an occasional seaside residence.

The ground story and lower part of chimney-stacks are rough-cast, and the upper part weather-tiled and half-timbered. The roof is covered with red tiles. The joiners' work throughout is of pitch-pine.

The work was designed by Mr. Wm. Kidner, and executed by Messrs. Geo. Punnett & Sons, of Tonbridge.

## NO. 78, CORNHILL.

THIS building has been recently erected for the North China Insurance Company, as offices for the London branch. The ground story is of polished grey Aberdeen granite, and the super-

structure is of Portland stone and red gauged brickwork. Over the first-floor windows are carved panels typical of marine insurance,—the vessel in dock, on the high seas, and wrecked. The work was designed by Mr. William Kidner, and executed by Messrs. Grover & Sons.

**Civil and Mechanical Engineers' Society.**—Mr. R. E. Middleton, the President, delivered his address on the 5th inst., at a well-attended meeting held in the Westminster Palace Hotel. After the President had delivered his address, Sir R. Rawlinson proposed a vote of thanks, and gave the audience some idea of the great changes in the means of professional education since his youth. He had been the son, apprentice, and journeyman to a general builder, and had made it his object to be able to earn his wages at each of the building trades. He asserted that this practical training was as important as the theoretical.

**Alfreton Waterworks.**—On the 3rd inst., the Alfreton Water Committee formally opened their new impounding reservoir at Lindway. It is stated that the reservoir is constructed of sufficient capacity with the old reservoir to store water enough for the driest summer. An embankment has been thrown across a valley, and about 40,000 loads of earth removed. The capacity of the reservoir is 8,000,000 gallons. Since the resignation of the former engineer, Mr. W. H. Radford, C.E., of Nottingham, has superintended the works. The contractors are Messrs. Meats Bros.



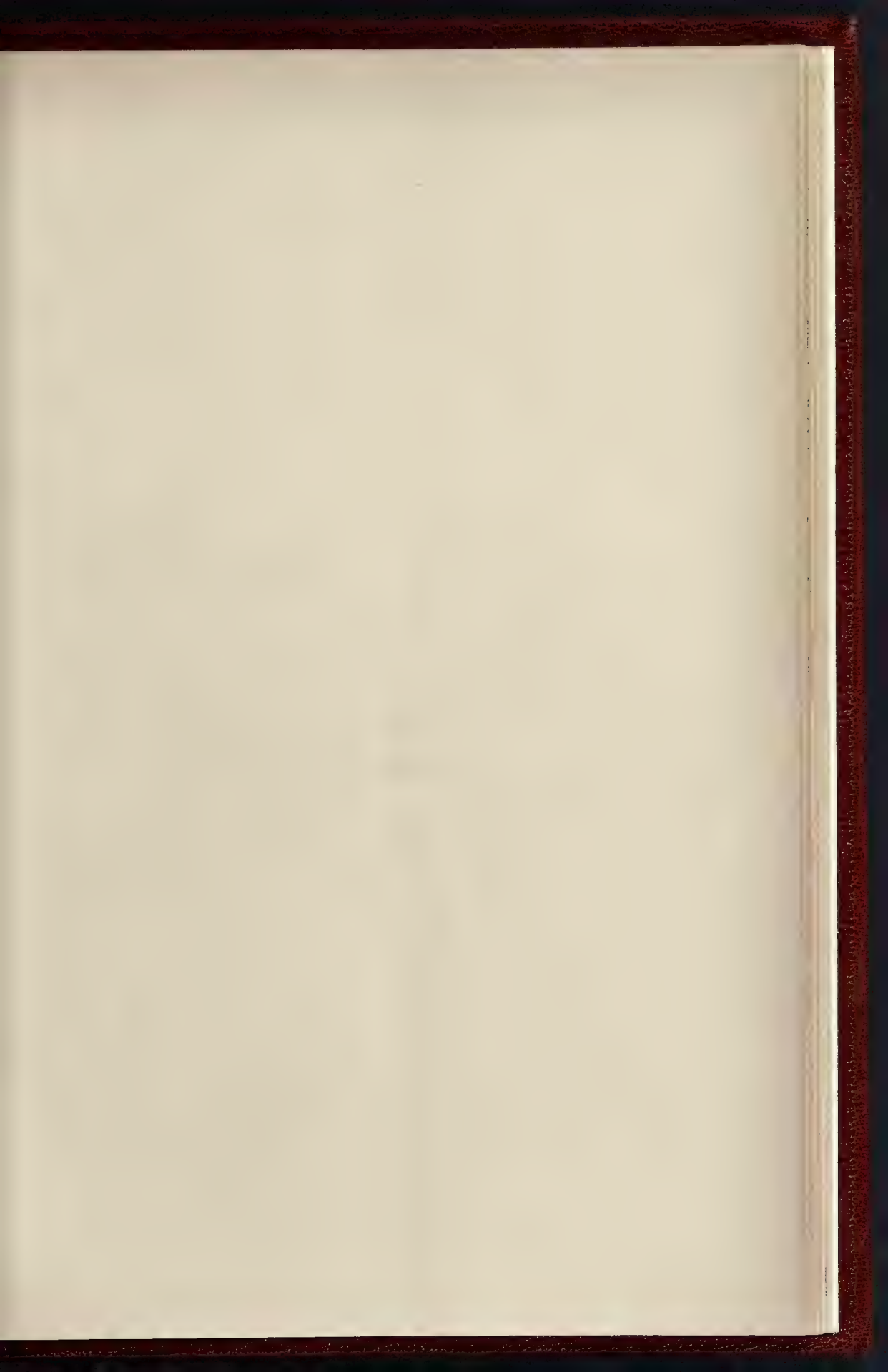




BAYONNE CATHEDRAL.—THE WEST FRONT.

The Phototype Co., 303, Strand, London.







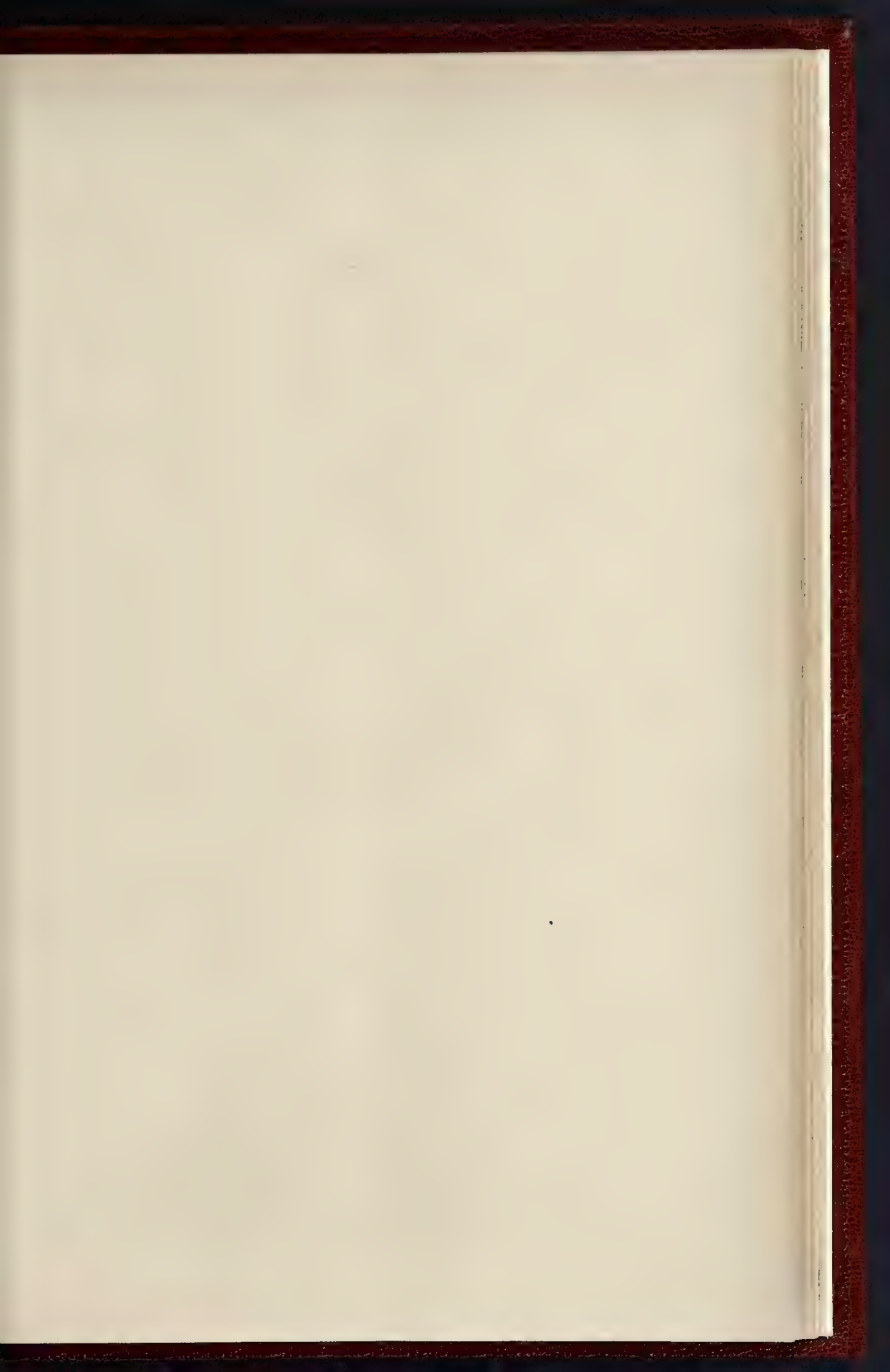
UPTON PARK, SLOUGH.—MESSRS



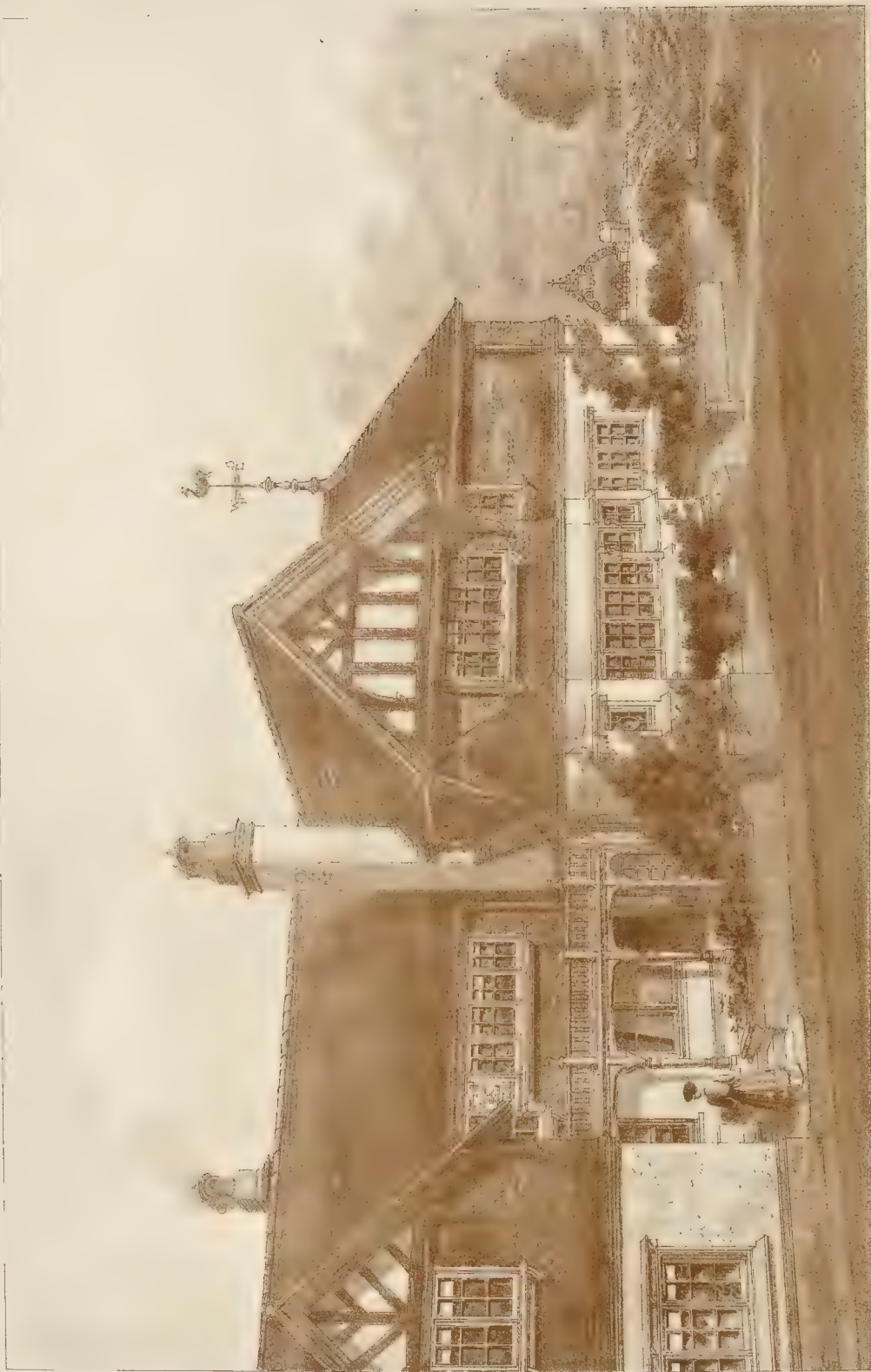








THE BUILDER, DECEMBER 15, 1898



COTTAGE AT EASTBOURNE.—MR. W. KIDNER, F.R.I.B.A., ARCHITECT.

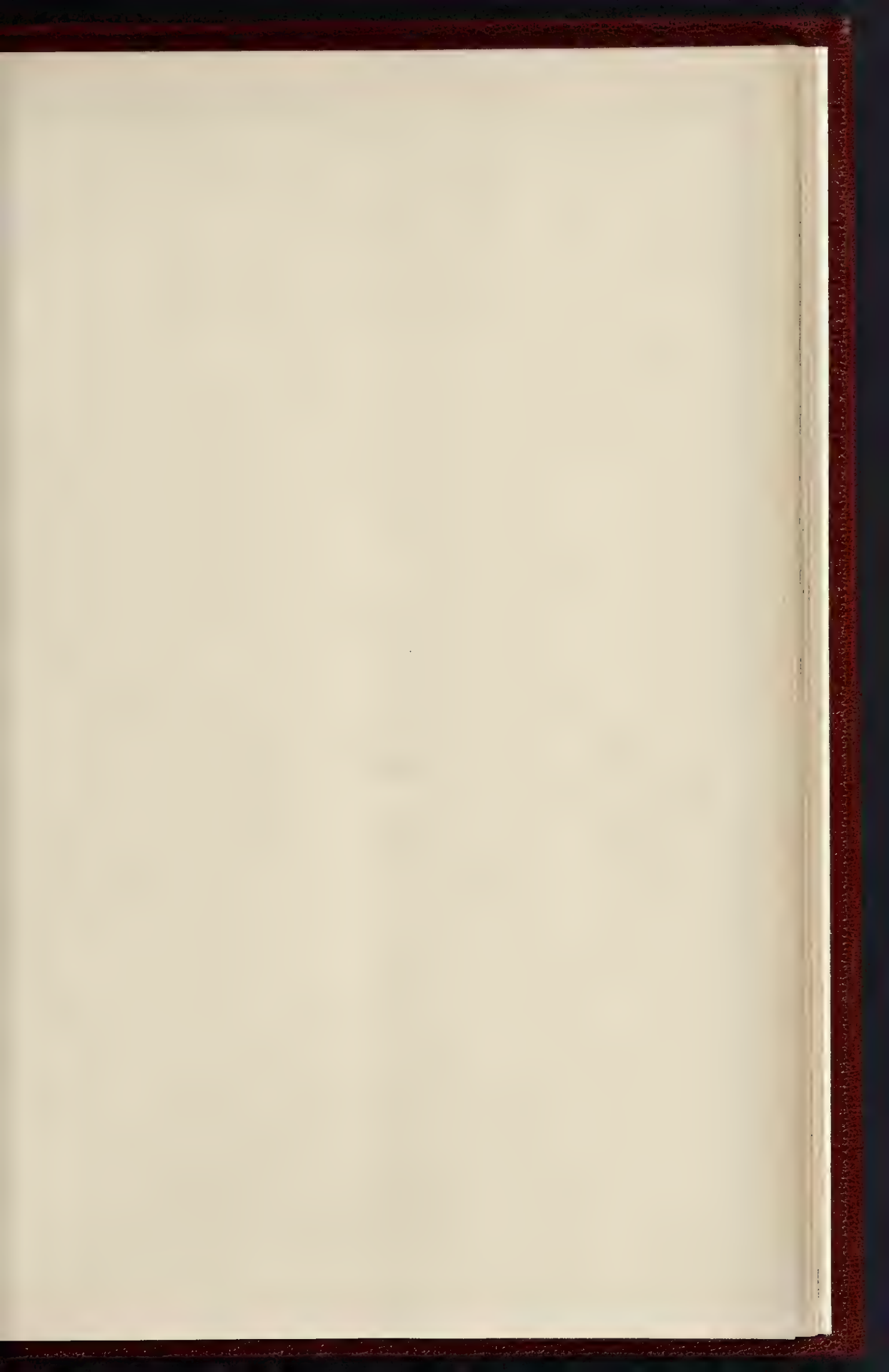




PREMISES, No. 78 CORNHILL. -MR. W. KIDNER, F.R.I.B.A., ARCHITECT.





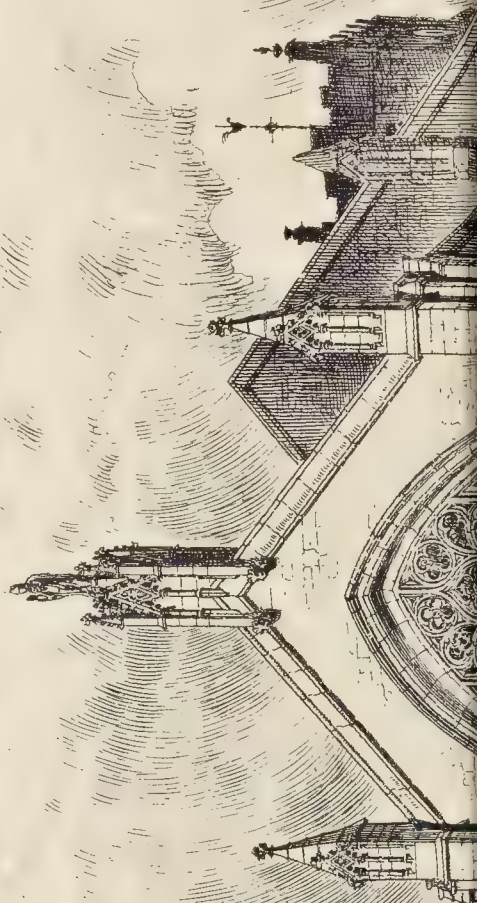
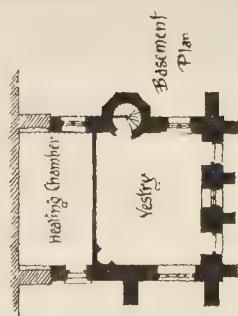
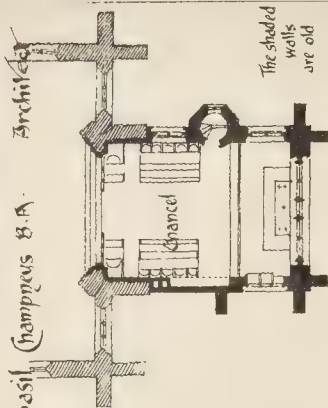


# The Church of Saint Thomas à Becket - Upholland Wigan

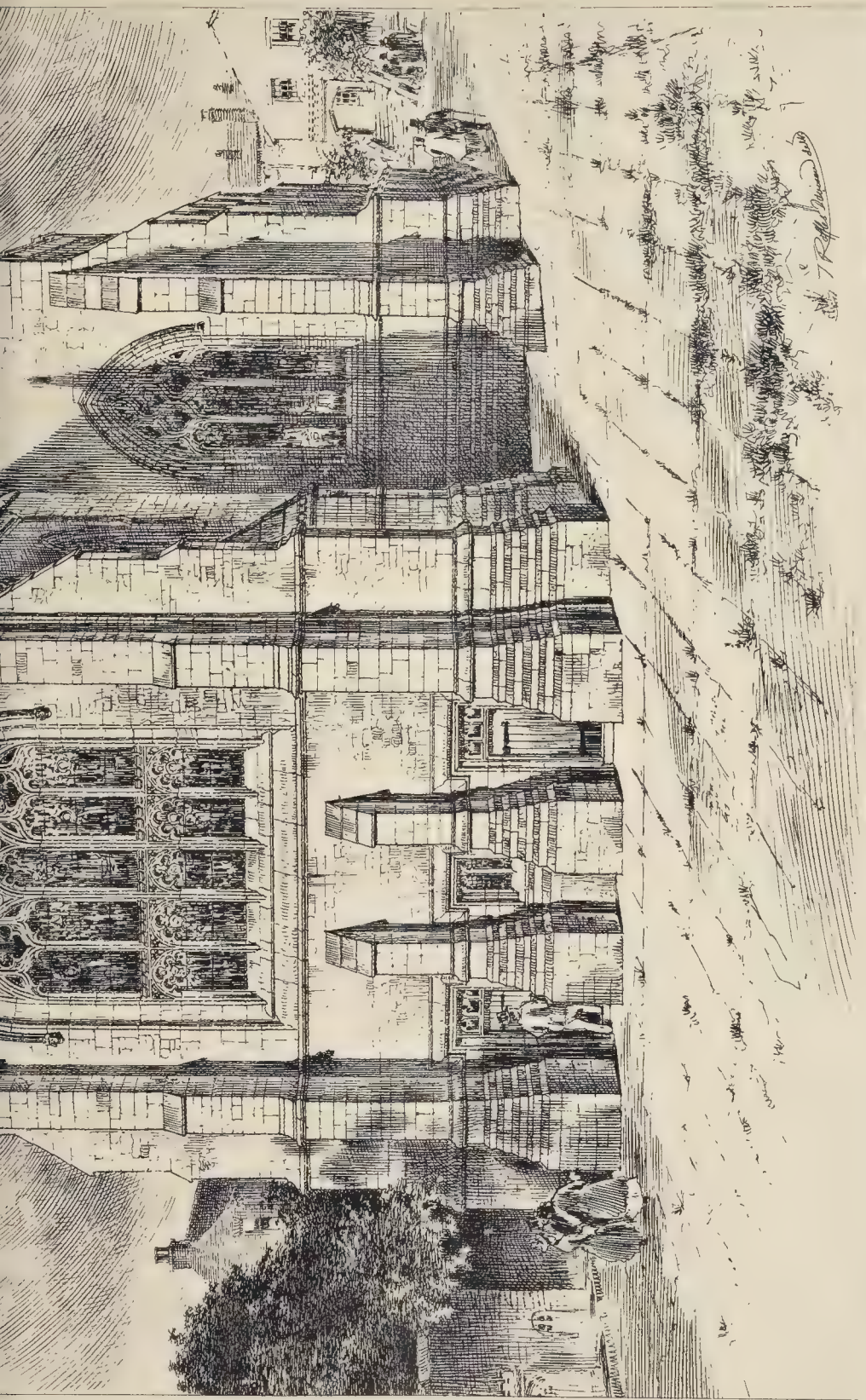
The New Chancel

Basil Champneys R.A.

Architect



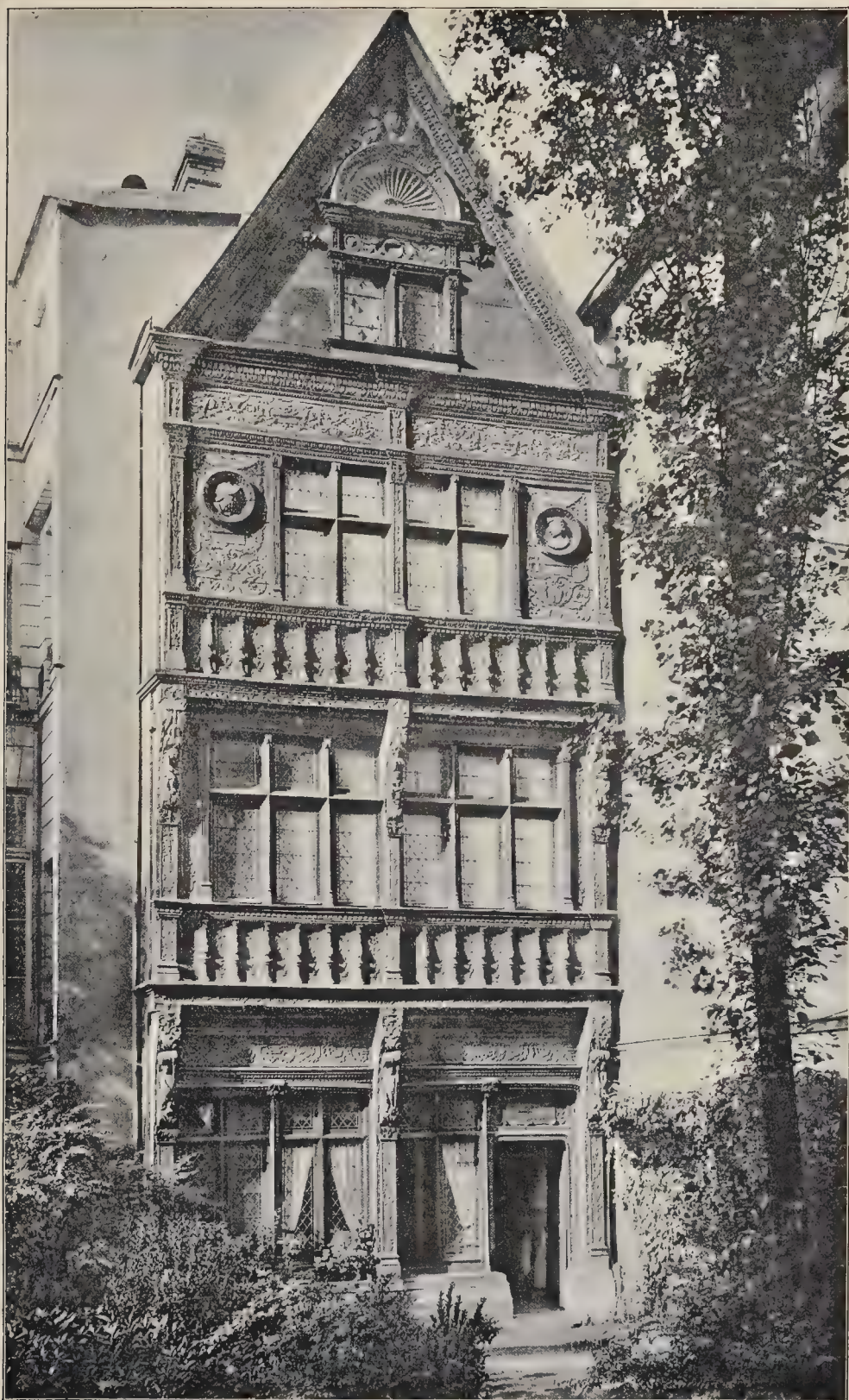




THE CATHEDRAL OF ST. JOHN THE BAPTIST, NEW YORK







The Phototype Co., 323, Strand, London.

WOODEN HOUSE-FRONT IN THE RUE ST. ANDRÉ, ROUEN.





## NEW BILLS AND NEXT SESSION.

On November 17 we advertised to three schemes for street improvements that have been undertaken by the Metropolitan Board of Works. These are included in the Board's Bill for next session. That Bill, moreover, will cover the following works: The widening and improvement of Jamaica-road, Bermondsey, between Major and Drummond-roads; a new street from Evelyn-street to Creek-road, Deptford, the Southwark and Deptford Tramways contributing thereto; the extension of Friendly-street, Deptford, to Greenwich, and the widening of Mill-lane, in the parish of St. Paul, along its western side, between the Broadway and Friendly-street. Also the widening of Black Lion-lane, Hammersmith, the vestry contributing,—from the public-house by that sign to the road-way into Chiswick Mall; with several widenings and improvements along Nine Elms-lane, Lambeth, York-road, and Battersea Park-road. It is further intended to widen and improve the Albert Embankment, Vauxhall, between Vauxhall-walk and Upper Kennington-lane (eastern side), and between Upper Kennington-lane and Marble Hall-lane (western side). The Board, moreover, propose the construction of a road-bridge, to be known as Cromwell-road Bridge, with approaches thereto, across the railway lines at a point about seventy yards distant from the end of Fenelon-road, near to the Lillie-bridge Works; and that in connection with such bridge the London County Council shall construct a new road, in Kensington parish, from Warwick-road to Ashley Cottages, Penon-road.

In the matter of open spaces the Board of Works seek that enabling powers shall be conferred upon the County Council for the purposes following:—To defray the costs incidental to the maintenance, management, and laying out of Clissold Park, as acquired by them under the Act of last year; to lay out for public resort, and hand over to the Vestry of St. George-in-the-East, the Trench-street ground at London Dock; to lay out and plant the two vacant plots at the northern end of Shaftesbury-avenue; and to purchase and lay out the disused burial-ground adjoining Whitefield Tabernacle in Tottenham Court-road, the Council and St. Pancras Vestry to divide the expenses of such purchase, &c., as well as of the erection thereon of lodges or other similar buildings. We gave an account of this last-named area in our columns of July 28 last.

A Bill will be introduced for empowering the Lords Commissioners of her Majesty's Treasury to provide for vesting in the Postmaster-General the site and buildings of Coldbath-fields Prison, in St. Pancras and St. James's, Clerkenwell, parishes, which cover rather more than nine acres of ground, lying between Farringdon-road (north-east), Mount Pleasant and Baynes-row (south-east), Phoenix-place (south-west and west), and Lower Calthorpe-street (north-west). This Bill will further empower the Lords of the Treasury or the Postmaster-General to transfer portions of that site to the County Council or to the Commissioners of her Majesty's Works and Public Buildings for dedication to public use; and will also provide for the extinguishment of a certain right of way from Aldersgate-street to the old burial-ground of St. Leonard, Foster-lane, along the southern side of the money order office. That burial-ground, which abuts southwards upon the old Roman wall in St. Martin's-le-Grand, was recently levelled and thrown into the churchyard, now open to the public, of St. Botolph Without, Aldersgate. It is understood that a part of the prison site is to be appropriated for purposes of the parcel post services.

The Corporation of London will ask for an Act to continue the Coal and Wine Duties, together with enlarging powers as to the several statutes at present in force *ad hoc*; and to provide for applying revenue therefrom to such public improvements, open spaces, &c., as may be prescribed by Parliament. Amongst those objects we may cite the projected Monumental Chapel and burial-ground at Westminster. It would hence appear that an available surplus is expected to accrue from the duties in question. Powers are sought, too, for an extension of time for completing the new Tower Bridge, and to make various temporary and permanent changes in the existing levels and lines of Tooley-street, Church-row, Pickle Herring-street, with other thoroughfares in St. John, Horsely-down parish, Southwark.

Another Bill has for its object the incorporation of a company by name of the Imperial

Docks of London. The new docks, with their railway and other works appertaining thereto, will be in West Ham parish, Essex. The dimensions of the two docks are set out as 706 by 353 yards, and 650 by 216 yards respectively. The ground chosen for these is situated, partly, on the site of the Victoria Graving Docks, and has the Victoria (London) Docks to the north. The works embrace a river-side wall or embankment 950 yards long, three piers or jetties, a new railway from Silvertown Junction, the raising of the level of North Woolwich-road, together with various other subsidiary undertakings.

A movement to which we referred in a "Note" on November 10th has assumed a fresh aspect. A Bill is announced for the purchase of the "Potteries" at Notting-hill, belonging to Charles Adams and Joseph Adams, and for its conversion into a recreation-ground or open space. The ground, bounded by Pottery-lane (east), William-street (south), St. Clement's-road (west), and Mary-place (north), adjoins a Board School. Powers of purchase, with management of the site, are to be conferred upon the London County Council and the Kensington Vestry, which two bodies are to be empowered to contribute funds from out of the rates. The Bill further provides for contributions by the Charity Commissioners and the trustees of the London Parochial Charities.

Amongst the more important Acts for which application will be made in the Parliamentary Session of 1889, and to which we have not already adverted, the following should be mentioned:—

(1) *Railways, Tramways, and Conveyance*.—By the Stratford-upon-Avon, Towcester, and Midland Junction Company: for an extension of time for the completion of certain authorised works, with the abandonment of three lines already authorised under the Easton, Neston Mineral and Towcester, Roade, and Olney Junction Act, 1879. By the Worcester and Broome Railway Company: for enabling them to make an extension of their line from Canons Ashby, in Northamptonshire, to Aylesbury, passing through Weedon, Sulgrave, Brackley, Tingewick, Steeple Claydon, Quainton, Fleet Marston, and Hartwell. Running powers will be sought over the Banbury branch of the London and North-Western and the Aylesbury and Buckingham Railways, and authority for the Metropolitan Railway to subscribe 100,000*l.* towards this undertaking, with the customary conditions as to sharing in the stock and representation of the company. By the Lancashire and Yorkshire Railway: the widening of some of their lines in Blackburn, Manchester, and Ashton-under-Lyne, and of their Liverpool and Bury line, between Kirkdale and Walton, the tunnel here to be converted into an open cutting. By a new company under style of the Great Eastern, Great Northern, and Northern Lines Junction Railway: for railways from the Great Northern and Great Eastern Joint Railway to the Hull, Barnsley, and West Riding Junction, Lancashire and Yorkshire and North-Eastern Railways, including a line from Misterton, Nottinghamshire, to Snaith, on the Hull and Barnsley line, with a branch therefrom, at Goudall, to Heck. By the Midland Railway: three branches, Methley to Castleford, in the West Riding; Hucknall-under-Huthwaite to Sutton-in-Ashfield, and St. Mary, Leicester, to Croft; for the "Saxby curve," from Melton Mowbray to Wymondham; the two "Spalding connecting lines" in that parish joining the Spalding and Bourn and the Spalding and Lynn lines of the Eastern and Midlands Railway, and effecting a junction with the Peterborough and Spalding branch of the Great Northern Railway; for two "Bow branches" in West Ham, Essex, and for widening their St. Pancras line between St. Pancras-road and the bridge over the Regent's Canal, London. By the Great Western Railway: for certain junction lines on their system in Plymouth, Roath, Mynyddislwyn, and Glamorgan, and railways in Ruabon and Wrexham parishes, Garw Valley; for widening (in conjunction with the Midland Railway) the station bridge over the Avon, at Bristol, with improved approaches thereto; and for the vesting in them of several undertakings of the West Somerset, Witney, and Wye Valley Companies. By the North-Eastern Railway: for the construction of three branch lines—Pittington to St. Oswald, Durham; from their York and Normanton branch at Featherstone, W.R., to Messrs. Hunt Brothers' chemical works; and from their Victoria Dock branch railway, Hull, to the Hull, Barnsley, and West Riding Junction line; and for various other purposes. A line by name of

the North-West Central Railway from a junction with the West Lancashire line at Penwortham, to the Halifax, Thornton, and Keighley line (Great Northern) at Bingley, passing through Blackburn, Osbaldeston, Ribchester, Stonyhurst, Pendleton, (Lancs.) and Bradford, Haworth, Keighley, and Harden (W.R., Yorks.). By the North and East London Junction Railway (a new company): for making a line through St. Leonard, Shoreditch, St. Matthew, Bethnal-green, and St. Mary, Whitechapel, parishes, which shall connect the North London line at Shoreditch station, with the East London Railway at its Whitechapel station. By a company under style of the London Central Subway Company: for an underground line from Piccadilly, St. James's-street, to the south-western end of Shaftesbury-avenue, and so beneath that thoroughfare and High Holborn, on to Holborn-circus. The standard gauge of 4 ft. 8½ in. will be adopted, and electricity for the motive-power. By the S.E. Railway and the Channel Tunnel Company: to alter, enlarge, and extend for experimental purposes the present works at Hougham, westwards of Shakespeare's Cliff, Dover, with the view to ascertain and determine the practicability of making and maintaining the tunnel to France. If the experiments demonstrate the feasibility of the scheme, they propose to vest in the Lords of the Treasury the sole right of determining the expediency of prosecuting the permanent works, their lordships to take over the said experimental works within ten years' time upon such terms as may be agreed or settled by arbitration. For the incorporation of a Company to acquire the existing South Staffordshire and Birmingham District Steam Tramways, together with several like lines in Wednesbury, West Bromwich, Walsall, Dudley, and Tipton; and to employ cable or electric power for haulage or propulsion in connexion therewith.

(2) *Navigation, Water, and Light*.—By the existing Sheffield and South Yorkshire Canal Company: for re-incorporation by style of the Sheffield and South Yorkshire Navigation Company; and for acquiring, by agreement or arbitration, the Stafrforth and Keadby, Dearne and Dove, and Sheffield and Tinsley canals, together with the navigation of the river Dene, as at present undertaken by the Manchester, Sheffield, and Lincolnshire Railway Company. This Act also covers certain fresh canals, docks, and other works at Sheffield and Rotherham; and at Althorpe, in the parts of Lindsey, Lincolnshire. By the Cambrian Railways Company: for further capital therewith to establish a new steamboat service between Aberdovey, Aberystwith, Portmadoc, and Pwllheli, and Wexford, Waterford, Arklow, and Wicklow, with other ports. To transfer to a new Conservancy Board the existing powers and property of the river Dee Company, the Commissioners, and the Corporation of Chester, in respect of the navigation of that river, with jurisdiction ranging between the old bridge at Chester and Aire and Hible Points. By the Newcastle and Gateshead Water Company: for enlargement of their system by the making of two new reservoirs, and sundry conduits or lines of pipes in connexion therewith, in Newburn, Ovingham, Elsdon, Troughend, and Rochester. Similar new works, on an extensive scale, are asked for by the Eastbourne Waterworks Company, including two new reservoirs in the field known as "part of Grey Nore," together with the enlargement of the two reservoirs in that field, and of their "Paradise Plantation" reservoir; and also by the Bristol (Somerset) Water Works Company. The London Electric Supply Association will apply to the Board of Trade for provisional orders under the Electric Lighting Acts, 1882 and 1888, for powers to supply and sell electricity and electric current for public and private purposes over an area as follows:—St. Martin-in-the-Fields, St. Margaret and St. John, and St. James, Westminster; St. George, Hanover-square; Chelsea, Kensington, Paddington, Marylebone, St. John, Hampstead; St. Pancras, Islington, Clerkenwell, St. Leonard, Shoreditch; St. Luke, St. George-in-the-East; the Strand, St. Giles, Holborn, and Whitechapel districts; City and Liberties of London, Lincoln's-Inn, Gray's-Inn, Inner and Middle Temple, St. Mary, Rotherhithe; Greenwich District; St. Mary, Lambeth; St. Mary, Newington; St. George-the-Martyr, Southwark; St. Mary, Bermondsey; and the St. Olave and St. Saviour and Christchurch districts. This Company seek powers to place electric lines "in, through, under, over, or along, and either above or beneath the surface" throughout the whole of this area.



Compared with the totals (in brackets) for last year, the private Bills for which plans have been deposited are: 47 railways (58), 14 tramways (15), 54 miscellaneous (46), 46 provisional orders (38),—being 161 in all (157).

#### THE EXAMINATION IN ARCHITECTURE.

THE November Examination of candidates for the Associateship of the Royal Institute of British Architects commenced on Monday, the 26th ult., and terminated on Saturday, the 1st inst., when it was found that thirty-one out of the thirty-eight candidates who presented themselves had passed. The seven remaining candidates were relegated to their studies for one year. The written and graphic examination was held in the Meeting-room and Library under the charge of seven moderators; and the oral examination, conducted by the Board of Examiners, occupied the whole of Friday and Saturday. The following gentlemen are now qualified for nomination in the usual form as Associates, namely:—

Burrows, H. W., London.  
Cole, R. L., London.  
Ell, S. A., Acton.  
Figgs, P. P., London.  
Gething, J., Penarth.  
Green, M. A., London.  
Griffiths, H., Sutton.  
Gunniss, J. W., London.  
Hudson, J., London.  
Jennings, E. W., Swansea.  
Jones, F. L., Queensland.  
King, C. O., London.  
Ladds, S. I., London.  
Lancaster, H. V., London.  
Lorimer, R. S., Edinburgh.  
Macara, J. A., B. So., London.  
Moull, W. A., Brentwood.  
Newberry, J. E., London.  
Oakeshott, G. I., Ealing.  
Parker, A. S., Exeter.  
Pywell, W., Hanwell.  
Roberts, T. P., Bristol.  
Taylor, A. E., London.  
Taylor, W. S., London.  
Thomson, H. H., Leicester.  
Tooley, H., Buckhurst Hill.  
Tromp, F. W., London.  
Waterhouse, P., M. A., London.  
Wells, W. K., Wood Green.  
Williams, W. A., Mountfield, Sussex.  
Willcock, R., Stamford Hill.

Time did not permit of the consideration, in time for this announcement, of the award of the Ashpitel Prize for the current year, but the Board of Examiners are to meet shortly, and an early announcement of the award will be made to the Institute.

#### THE ROYAL ACADEMY SCHOOLS.

THE prizes gained by the students in the Royal Academy Schools were distributed on Monday night by Sir Frederic Leighton, in the presence of a large company, which included many of the Royal Academicians and Associates. The following are the prizes awarded, with the names of those who gained them:—

Landscape painting.—Creswick Prize (30*l.*), John Henry Frederick Bacon. Painting of a figure from the life.—Silver medal, 1st, Marcus Worsley Blackden; silver medal, 2nd, William T. Maud. Painting of a head from the life.—Silver medal, 1st, Stephen Briggs Carhill; silver medal, 2nd, Percy Short; *pro vice accessit*, Ernest Appleby. Copy of an oil painting.—Silver medal, 1st, Thomas Eyre Macklin; silver medal, 2nd, not awarded. Copy of a landscape.—Silver medal, not awarded. Cartoon of a draped figure.—Silver medal and prize (25*l.*), Arthur George Walker. Design in monochrome for a figure picture.—Armitage Prizes, 1st (£30) and bronze medal, Leonard Leslie Brooke; Armitage Prizes, 2nd (10*l.*), William T. Maud. Design for the decoration of a portion of a public building.—Prize (40*l.*), William Farran Little. Drawing of a figure from the life.—Silver medal, 1st, Stephen Briggs Carhill; silver medal, 2nd, Harry Wainman Fry. Set of six drawings of a figure from the life.—1st prize (50*l.*), not awarded; 2nd prize (25*l.*), Stephen Briggs Carhill\*; 3rd prize (15*l.*), Sigismund C. H. Goetze; 4th prize (10*l.*), John Henry Frederick Bacon. Drawing of a head from the life.—Silver medal, 1st, Ailes Maria Dieker; silver medal, 2nd, Ernest Spence. Drawing of a statue or group.—Silver medals, 1st and 2nd, no competition. Drawing of a statue or group.—Prize (10*l.*), Ella Brown. Perspective drawing in outline (open to painters and sculptors only).—Silver medal, no competition. Model of a design.—1st prize (30*l.*), Herbert Charles Nye; 2nd prize (10*l.*), Arthur George Walker.\* Set of three models of a figure

\* Disqualified owing to having received the same prize before.

from the life.—1st prize (50*l.*), Henry Charles Fehr; 2nd prize (20*l.*), John Wenlock Rollins. Model of a figure from the life.—Silver medal, 1st, Henry Charles Fehr; silver medal, 2nd, Charles John Allen. Restoration of a mutilated antique statue.—Silver medal, not awarded. Model of a statue or group.—Silver medal, 1st, Paul Raphael Montfort; silver medal, 2nd, F. Model of a statue or group.—Prize (10*l.*), Anna Maria Gayton. Design in architecture.—Travelling studentship (60*l.*), Arthur Rutherford Jemmett. Set of architectural drawings.—Silver medal, 1st, Charles Spencer Haywood; silver medal, 2nd, not awarded. Set of architectural designs (upper school).—Prize (25*l.*), George William Nicolay. Set of drawings of an architectural design (lower school).—Prize (10*l.*), Francis Donkin Bedford. Perspective drawing in outline (open to architects only).—Silver medal, Amos Francis Faulkner.

The Landseer Scholarships, in painting and sculpture, of 40*l.* a year each, tenable for two years, given for the best work done in the examination for passing into the second term of studentship, have been awarded—in painting, to Percy Short and Harold William Boucher; in sculpture, to Thomas Richard Essex and William Henry Prosser.

#### SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held at Westminster Town-hall, on the 3rd inst., Mr. A. T. Walmisley, President, in the chair, a paper was read on "High-pressure Steam and Steam-engine Efficiency," by Mr. W. Worby Beaumont, M. Inst. C.E. In the first part of the paper attention was again called to the misleading results of the common application of the theory of the perfect engine as a basis for an index to the comparative efficiency of actual engines, working under different conditions and with different pressures. Examples of the reasoning based upon this interpretation of the "Carnot" theorem, or this application of the "Carnot" ratio, were given, as showing that it had been common to suppose that the useful limit to steam pressure would be reached at about 200 lb., or below it. Reasons for expecting very large increase in available work as due to the increase of pressures up to at least 300 lb. were given, with figures showing the extra work available per extra unit of heat used. In dealing with the steam-engine as a heat-engine, it was argued that considerations relative to the boiler as the producer of the steam, and as the receiver of the hot-water rejected by the engine, are irrelevant; and, further, that no part of the history of the steam used should be included other than that part [which begins with the admission of the steam into the cylinder and ends with its emission therefrom. In estimating the quantity of steam required to perform a given quantity of work, the steam necessary to fill the cylinder at the pressures shown by indicator diagrams was not credited with providing any of the heat necessary for the performance of the work, excepting only the units of heat represented by the difference between the total heat of steam at the initial and at the terminal pressures. In a non-expansive engine the whole of the heat equivalent of the work done would have, according to the paper, to be supplied in addition to that represented by the volume of steam required to fill the cylinder. This heat was assumed to be supplied by initial condensation, and an object of the paper was to show that the performance of work alone demands sufficient heat to account (with the exception of some very small losses) for the whole of the observed initial cylinder condensation. Proceeding on this thesis, it was argued that cylinder condensation apart from this is a very small quantity in the best actual engines, and that it consists mainly in loss of heat by evaporation during exhaust, and of slight losses due to radiation and conduction, and to clearance space not filled at initial pressure by compression. From this it was concluded—1. That as small a portion of the cylinder capacity as possible should be subject to exhaust influences. 2. That it follows from 1 that multiple stage expansion is necessary with the high pressures that are advisable, and that high speeds of rotation ought to be attended with economy.

The thirty-fourth annual general meeting of the Society was held on Monday evening last at the rooms of the Society, 9, Victoria-chambers, Westminster, S.W. The chair was occupied by Mr. A. T. Walmisley, President. The following gentlemen were duly elected by ballot, as the Council and Officers for the ensuing year, viz.:—As President, Mr. Jonathan R. Baillie (of the firm of Westwood, Baillie, & Co.); as Vice-

Presidents, Mr. Henry Adams, Mr. R. W. Peregrine Birch, and Mr. William Newby Colam; as ordinary Members of Council, Messrs. Chris. Anderson, James Henry Cunningham, George A. Goodwin, Robert Harris, James William Rastler, William Schönheyder, William Andrew Valon, and Joseph William Wilson, Jun.; as Honorary Secretary and Treasurer, Mr. Alfred Williams; as Honorary Auditor, Mr. Alfred Lass (Messrs. Alfred Lass & Co.). The proceedings were terminated by a general vote of thanks to the Council and officers for 1888, which was duly acknowledged by the Chairman.

The annual dinner was given on Wednesday evening last, at the Guildhall Tavern. The President (Mr. Arthur T. Walmisley, M. Inst. C.E.) occupied the chair, and amongst those present were Sir Edward Hertslet, C.B., Sir Philip Magnus, Mr. Jonathan R. Baillie, M. Inst. C.E. (President-elect), Mr. Henry Adams, and Mr. R. W. Peregrine Birch (Vice-Presidents), Messrs. J. H. Cunningham, Robert Harris, and J. W. Wilson, jun. (Members of Council), Messrs. Jabez Church, Charles Gandon, Perry F. Nurse, Arthur Rigg, Professor Robinson, and R. F. Spice (Past Presidents), Mr. Alfred Williams (Hon. Secretary and Treasurer), W. Worby Beaumont, S. J. Mackie, and Mr. G. A. Pryce Cuxson (Secretary). The usual loyal and patriotic toasts having been duly honoured, the President proposed "Success to the Society of Engineers." In doing so he stated that this Society had been in existence for more than one-third of a century, and notwithstanding the fact that kindred professional bodies existed, having somewhat similar objects, the Society continued to increase in numbers, the roll of members now containing 400 names. The main object of the Society had always been to benefit the younger members of the profession, principally by visits to works—a privilege which formed one of the chief benefits of membership in the Society. He added that it was incredible, to any who had not made the experiment, how much more might be learnt by the comparison of ideas, when conversing together in a body while examining work in progress, than when left alone simply to inspect. Various papers had been read by eminent authors at the ordinary meetings, and, in his opinion, no just critic of its "Transactions" could charge the Society with a want of freshness in the papers read, nor with a desire to exclude subjects profitable for discussion. The toast was responded to by the Honorary Secretary and Treasurer (Mr. Alfred Williams) and was enthusiastically drunk. Other toasts followed.

#### BUILDERS' BENEVOLENT INSTITUTION: ELECTION OF PENSIONERS.

AN election of one pensioner on the funds of this Institution was held at Willis's Rooms, St. James's, on Thursday, the 6th instant, Mr. Thomas G. Smith (Vice-President) in the chair, in the unavoidable absence of the President, Mr. J. Howard Colls.

There were three candidates for the one vacancy, viz. two men and one woman. The poll was open from two to four p.m. Shortly after the close of the poll the scrutineers, Messrs. Thomas Stirling and C. Russell, announced the results of the polling to be as follows, viz.:—James Fickling, 19, Mantua-street, Clapham Junction, aged 62, builder (fifth application), 2,079 votes; Ann Winter, 47, Maygrove-road, Brondesbury, aged 63, widow of Benjamin Winter, builder (third application), 2,185 votes; and Henry Whimble, 12, Devonport-road, Shepherd's Bush, aged 71, builder and decorator (first application), 1,817 votes (including thirty votes in respect of former contributions). The successful candidate was, therefore, declared to be Ann Winter.

Among the friends of the Institution (other than those already named) who took part in the proceedings, were Messrs. R. Perkins, Thos. Hall, F. Foxley, J. T. Bolding, G. B. New, and R. Richardson.

Votes of thanks to the chairman and scrutineers closed the proceedings.

**Fire at Messrs. Doulton's Potteries at Lambeth.**—We regret to report that on Tuesday night a serious fire broke out in Messrs. Doulton's potteries in High-street, Lambeth. The damage, it is estimated, cannot be less than 15,000*l.* It is stated that the property was fully insured in the County and Phoenix offices.

\* Only one student entered for this competition.



## "F.R.I.B.A." EXAMINATION.

SIR,—It appears to me that we should be taking up vantage ground by at once formulating the curriculum for the compulsory examination for Fellowship of the Institute. That this will deal with the philosophy of architecture, and architecture in its higher aspects, *va sans dire*, and by embodying them it would eclipse the suggestions recently brought forward by M. César Daly relative to "Hautes Etudes." After passing the "A.R.I.B.A." examination, the mental forces of Associates may be said to be in a state of equilibrium; but if the qualifying subjects for Fellowship were promulgated they might be, and would be at once, directed to that end. In the Royal College of Physicians, I am under the definite impression that the examination for Fellowship may be passed by a member before the condition referring to length of practice has been complied with. This is excellent in principle, and might well and at once apply to the R.I.B.A.

CHAS. R. GUY HALL, Associate.

## WARMING VILLAGE CHURCHES.

SIR,—Referring to the letter in your issue of 24th ult. [p. 382], it seemed to me, by the previous correspondence on this subject, that the idea was how to heat village churches without a flue or chimney. Assoc.-M.I.C.E. "does not solve the problem, but simply advertises Mr. Grundy, and, moreover, carries his flue under the seats some distance—a very dangerous method. Many a village church has been destroyed by an overheated due setting fire to woodwork, and in this way many valuable relics of the past have been lost.

The plan of heating chamber and entrance doors by "Assoc.-M.I.C.E." could be applied equally well to hot water, either high or low pressure; the pipes could have been laid in trenches and covered with gratings, but the heat would have been distributed well over the building. I can hardly credit that no inconvenience is experienced from walking over the hot-air gratings, my own experience being far from pleasant.

I think for village churches, and churches and public buildings generally, there is nothing yet invented to equal low-pressure hot-water heating for safety, efficiency, and economy in working, the cost of fuel being considerably less than required to keep the furnace of a hot-air—on, as I prefer to express it, "burnt air"—apparatus going, and the atmosphere is decidedly purer. In fact, I can cite instances where hot air has been tried and abandoned in favour of hot water.

The great drawback to hot-air systems is the furnace gets heated to a great degree, and the air is dried and deprived of a large percentage of its vitality; whereas with low pressure hot water the temperature is seldom raised above 180° Fahr., and the consequence is the air brought in contact with the pipes cannot be burnt, but simply warmed.

The plan I prefer is to have some air channels, and bring pure fresh air from the outside, warm it by contact with the pipes, and thus exit from the warmed air into the building, and not fill it with baked, vitiated atmosphere, injurious to breathe.

ENGINEER.

## "PURBECK MARBLE AND STONE."

SIR,—The article on the above in the *Builder* of the 17th ult. is somewhat misleading in one or two instances. You say in your article, "the freestone is not at all adapted to outside carving," and you give as an only instance the carving of two children over a doorway in Swanage. I may tell you these figures, and, in fact, the whole front of this building, are of Portland, not Purbeck stone.\* This was the original design of Messrs. Hall, Chespie, and designed by Sir Christopher Wren. The stones of which the figures form part were not re-cut, but, after more than two centuries exposure in London, were brought down here a few years ago and re-erected as a front to our Town Hall.

When you are again visiting Purbeck we should be glad to show you many examples of the durability of our freestone, and other beds, in some fine old mansions, many churches (such as Studland, Early Norman), the ruins of Bindon Abbey, and Corfe Castle, &c., &c. The latter, mainly built in the tenth century, exposed to all weathers on a high hill, and still showing the tool marks in the stone, is the place to place them! But I do not again we would refer you to Ransgate Pier, built about 150 years ago, all of Purbeck freestone.

You make the observation that the stone trade in Swanage is not as brisk as it might be, and my apology for troubling you with this is that we do not want our trade to suffer in consequence of statements which, however unintentional, are not founded on fact, or that architects or builders should

be led to believe that our stone will not stand the weather.

It is well known that there are good and bad beds of stone in all places and quarries, but I unhesitatingly state we have as good and durable a stone in Purbeck as is to be found in England, and plenty of it. I therefore ask you, in justice to our quarriers and our trade, to be good enough to insert this in your next issue. F. A. BURR.

1, Gordon-villas, Swanage,  
Dec. 4, 1888.

\*\* Our observation as to the state of angles, mouldings, &c., of work in Swanage which we definitely ascertained to be of Purbeck stone, was not favourable as to its qualities of endurance. The remark as to tool-marks, &c., in ancient buildings, is one which is usually made about every building stone with a past history which is recommended to the market.

## The Student's Column.

## ARTIFICIAL STONES.—XXIV.

Methods of Indurating Artificial Stone by Exposure to Gases (continued).

"SPENCE'S Metal," obtained by melting sulphur with the powdered sulphides of iron and copper, may also in some circumstances be used as an artificial stone, especially for the production of decorative plaques and other objects.

"Vulcanized Stone," so called, is formed from any soft porous stone or cement injected with (or less preferably, brushed over with) a compound of 56 parts of sulphur mixed at a steam heat with 44 parts of vinegar or dilute acetic acid. The materials so treated are said to become hard, non-absorbent, and capable of a high polish.

Asbestos as an ingredient in artificial stone is the main feature of novelty in several patents, of which the following are fair examples:—Hyatt's patent in 1873 directed that asbestos should be mixed with silicates, cement, clay, &c., to form an artificial stone "similar to the Ransome or Victoria Stone;" the mixtures were to be moulded under pressure or otherwise, and if clay had been used they must be burnt also.

Erichsen's patent (1881, pat. 2,040), also involves the use of asbestos mixed with such usual ingredients as chalk, silicate solution, metallic oxides, &c.

Brown and Brigham brought out in 1884 an improved asbestos compound for roofing, wearing surfaces of car brakes, and for building-stones, which was made as follows:—A mixture of magnesia and chloride of magnesium is added to asbestos (preferably the fibrous variety), and then moulded to any desired form. The oxychloride of magnesium is here the cementing material, and binds the asbestos very strongly, and a tough, hard variety of stone results. For a cheaper and lighter compound, vegetable fibre may be substituted for part of the asbestos.

The utilisation of a natural deposit termed "asbestine," found in parts of the United States of America, was patented in 1885 by Merritt; the asbestine, which seems to be a silicate of magnesium with a little alumina, oxide of iron and water, is ground to powder, mixed with quartz sand, and aqueous solution of caustic alkali; the mass can then be used as mortar, or to form a stone which is very homogeneous, and free from tendency to crack.

Magnesium compounds are used in many patents. The oxychloride is especially useful, and its properties have been carefully investigated by Sorel; it can be readily prepared by adding a concentrated solution of magnesium chloride to strongly ignited magnesia, and the mixture, after standing for some hours, solidifies to a mass so hard that it can be polished. It seems probable that after the material has been exposed to the atmosphere for some time, the hard basis consists of a mixture of carbonate and hydrate, as the chloride can be withdrawn from the thoroughly set compound by repeatedly boiling it in water, without disintegrating it in the least. Menier's patent (1865, pat. 3,119) seems to be the earliest one in which this substance was practically applied. This inventor used for the purpose of agglutinating together sands, grits, pebbles, &c., a cement composed of magnesia and the carbonate and hydrate of magnesium worked up with a solution of the chloride. A specially ornamental stone is formed by adding to this cement kaolin, talc, sulphates of barium, cal-

cium, and lead, and, if desired, iron pyrites and ochres to give various colours and effects.

Munroe, in 1869, obtained provisional protection only for an invention which was, for all practical purposes, the same as Menier's, bitterne water (essentially an impure chloride of magnesium) being used in place of ordinary solution of chloride of magnesium. Delon (1874, pat. 525) made artificial stone by adding to powdered limestone and sand a mixture, in water, of magnesia, chloride of magnesium and carbonate of soda.

In Sorel's process, the natural carbonate termed "magnesite," is calcined to magnesia; in this state it is mixed dry with powdered marble, sand, or similar materials, and then wetted with bitterne water, which brings about the formation of oxychloride. The mixture is rammed into moulds, where it speedily hardens, and in two weeks is ready for use. Pelletier, in 1882, attempted the utilisation of the oxychlorides of such metals as calcium, zinc, &c., by the employment as binding materials in artificial stones of mixtures of the respective oxides and chlorides.

Cowie, in 1884, also modified the oxychloride process by using a mixture of chloride of aluminium with magnesia or the sulphide of magnesium; in some cases the chloride of aluminium may be mixed with other chlorides, such as those of magnesium and iron; this mixture is said to be very useful in the production of rough hard stones.

## STAINED GLASS.

*Brechin.*—The large window at the west end of St. Andrew's Church, Brechin, has been filled with stained-glass, by way of memorial to the late Earl and Countess of Dalhousie, by the tenantry and other friends upon the Brechin and Edzell estates. The chief subject, which occupies the whole of the upper portion of the three principal openings, is "Christ's Sermon on the Mount." Below this, in the lower part of the window, three other pictures assist to tell the story and to illustrate the divine exhortation. Below the words, "Blessed are the meek," is shown the subject of "The Publican and the Pharisee;" below "Blessed are they that mourn," is "Christ raising the Widow's Son;" and below "Blessed are the merciful," "The Good Samaritan." All these subjects are surmounted by canopies of elaborate design, and surrounded by borders and other ornaments in keeping with the character of the work, and the tracery lights above contain the coats of arms of the Dalhousie and Tankerville houses, angels, and rich ornaments, with the cross of St. Andrew above all. The work is from the studio of Messrs. Powell Brothers, of Park-square, Leeds.

*Glossop.*—The parish church of Glossop, West Cheshire, has just received a two-light stained glass window, representing the "Good Samaritan." The work has been designed and executed by Messrs. Mayer & Co.

## Machinery at the Smithfield Club Show.

—There was a fairly good display of machinery at the annual Cattle Show, held in the Agricultural Hall, Islington, this week, but we did not notice many novelties. Messrs. Eddington & Stevenson, of Chelmsford, exhibited a compound spring traction engine, which claimed to be the lightest and narrowest engine of the size ever made. Its weight is six tons, its extreme width, 5ft. 10in., and it is geared for three speeds. It seems to be well-adapted for hilly country. Messrs. Marshall, Sons, & Co., of Gainsborough, exhibited some useful portable and other engines, all possessing good points, but as to which we have no space to enter into details. It need hardly be said that such well-known firms as Clayton & Shuttleworth, John Fowler & Co.; Davey, Paxman, & Co.; Burrows & Co.; Ransomes, Sims, & Head; E. S. Hindley; and Allchin, Linnell & Co., were, as usual, well to the fore. Mr. John Bellamy exhibited tanks, cisterns, corn-bins, &c.; The St. Pancras Iron-works Company exhibited fittings for piggeries, stables, &c.; Mr. O. G. Roberts showed his well-known "rain-water-separator"; Messrs. Piggott Bros. were exhibitors of tarpaulins, rick-cloths, &c.; Messrs. F. Morton & Co. (Limited), exhibited, besides wire-fencing, &c., a model of a very good system of constructing rick-sheds, &c., of fire-proof material.

\* This has already been noticed (page 384 ante).—Ed.



## Books.

*The Practical Engineer's Handbook, comprising a treatise on Modern Engines and Boilers, Marine, Locomotive, and Stationary, and containing a large collection of rules and practical data relating to recent practice in designing and constructing all kinds of engines, boilers, and other engineering work; the whole constituting a comprehensive key to the Board of Trade and other Examinations for certificates of competency in modern Mechanical Engineering.* With upwards of 370 illustrations. By WALTER S. HUTTON. London: Crosby Lockwood & Co.

THE work is divided into sections, and in these the subjects are treated of, as it appears to us, somewhat at random. There is, however, an alphabetical index at the end of the book. The first section deals with "air, wind and wind-motors; water and water-motors; heat and fuel; gas and gas-engines; combustion, &c." Here is a definition from the first page—

"Carbonic acid gas is frequently found in mines, where it is called choke-damp, or black damp."

This is not very comprehensive or very scientific. On the next page we have a formula for fixing the power required to compress a given volume of air, which does not give results comparable with those of ordinary practice, so far as our experience goes, notwithstanding the fact that the author is indebted for it to our contemporary, the *Engineer*. No doubt "practical engineers," like other mortals, are often anxious to know beforehand the state of the weather, and Mr. Hutton gives a short column to enable one to make a forecast. For instance, 28 in. of the mercury in the barometer indicates "stormy weather," 28.5 in. "much rain," and so on to 31 in. "very dry." Now, all this is lamentably crude and incorrect, for the coming weather is not so much indicated by the height of the mercury as by its fluctuations. Here is another extract in the same connexion—

"A column of mercury, 1 in. square, and 29.922 in. high—or, in round numbers, 30 in. high,—at 32 deg. Fahr., will equal or balance the pressure of the atmosphere."

Well, that depends; but we should like to ask Mr. Hutton what a column of mercury one mile square would do?

Rules for the measurement of flowing water are given, there being an illustration of the notched board. The method of measurement through an orifice is also mentioned, though here we do not find theory, as represented by Mr. Hutton, quite square with our preconceived notions of what is usually followed in practice; taking the author's own example as a test case. Turning over several pages, we find a good chapter on liquid fuel, illustrated by some well-selected woodcuts. These refer to Mr. Urbahart's system of burning liquid fuel, the data and illustrations being taken from *Engineering*. In the section devoted to petroleum engines, Spiel's motor is the only one mentioned.

There are some crude "rules" given in the marine engineering department, e.g.:

"The consumption of coal in marine boilers varies as the distance steamed, multiplied by the square of the speed of the ship."

"The consumption of coal in marine boilers per unit of time varies as the cube of the speed of the ship."

The author goes so far as to say that,—"The speed of a steamship due to a given consumption of coal may be found by the converse of the last rule." There is more of this kind of thing, but it is to be hoped that the "practical engineer," for whose guidance the book has been compiled, will be sufficiently practical to take these rules *cum grano*.

A good deal of space is accorded to the subject of safety-valves and injectors, feed-pumps, and feed-water-heaters follow. Various types of boiler are dealt with. Several illustrations of boiler explosions are given, but the subject is naturally far too large to be more than cursorily touched upon in the nine pages devoted to its consideration.

We now come to the third section of the book, which is devoted to "steam, condensation, condensers, air-pumps, water-pumps, slide-valves, piston-valves, Corliss, and other valves; link-motion and other valve-gears, &c." The data here is well selected, and the author has compiled judiciously in most cases. The "rules," as usual, are the most questionable part, and some of them are not by any means so compre-

hensive as the author appears to suppose; in fact, one of his chief faults is to lay down hard-and-fast rules, and to lead the reader to suppose that they have a universal application, as if there were no disturbing conditions varying with so many different positions. However, the "practical engineer" does not want to be told that there is no royal road to engineering practice by means of "rules," any more than to other branches of learning, so perhaps no great harm is done beyond a waste of printer's ink and clean paper.

The next section deals with details of steam-engines. The matter, again, is well selected and well illustrated, the author being successful in getting a great deal of very practical information in a small space. It is here that formulae find a more legitimate place, and the rules and examples from actual practice may be studied with advantage. This division of the book concludes with a section devoted to hydraulic propulsion. The author quotes the *Nautilus* experiments, and gives a couple of illustrations of the propelling machinery of that vessel. We would, however, refer him to the torpedo-boat experiments described so fully by Mr. Sidney Barnaby before the Institution of Civil Engineers as being far more suited to his purpose.

On the whole, in spite of the faults we have pointed out, the book leaves a favourable impression, and should prove a distinctly useful work in the hands of those who are capable of exercising some discretion as to what should be accepted and what rejected. To the young and inexperienced engineer or amateur it might prove a stumbling-block, but for the "practical engineer"—i.e., the engineer who has had practical experience—it should prove a useful ally. The binding and printing are deserving of a word of praise.

*Lockwood's Dictionary of Terms used in the Practice of Mechanical Engineering.* Edited by A. FOREMAN PATTERNS-MAKER. London: Crosby Lockwood & Co. 1888.

A REALLY good and comprehensive dictionary of engineering terms is a book that would be much appreciated. The work in question contains upwards of six thousand definitions, so there must necessarily be a great deal in it that will supply information to the majority of readers, but there are several omissions. Here are a few which we observe in the course of a casual inspection, opening the book at random.

"Live Roller" is described as "a roller which does not revolve on a spindle, but is free to move around or along its path. Live rollers are used for turntable centres, and the slewing motion of large cranes." The author quite ignores that numerous class of "live rollers" which are used, for instance, in rolling-mills, and are by no means free to move around or along a path, but are driven by bevel gearing for transporting the ingots. Under the letter T we do not find the word "Transformer." Dry steam is described as "steam which has neither been superheated on the one hand, nor mixed with the water of priming on the other, but remains in the normal condition, which experience has proved to be the most suitable for use in engine cylinders. Called also saturated steam." This, we think, is a very poor definition, and not accurate under certain conditions. To describe the term without reference to the relation between pressure and temperature is not possible. Saturated steam is described as follows:—"Steam is said to be saturated when it remains in contact with the water from which it is generated. It then holds a quantity of moisture in suspension, and is not in the condition of a true gas. Also called dry steam and vaporous steam." The word dynamo does not occur. There is no reference to tamping, as used in mining operations. Tachymeter does not occur, neither does ingot-iron. To the word "Calorimeter" we find the following explanation attached:—"The section area of a boiler-flue, given in square inches, is sometimes termed the calorimeter of the boiler." No mention is made of the instrument which is used for ascertaining the specific heat of a body. Ampère, ohm, and commutator are all left out, but here it dawns on us that the author has ignored that important branch of engineering which deals with electrical phenomena, as the word "electricity" itself does not occur.

*Turning Lathes: a Manual for Technical Schools and Apprentices.* Edited by JAMES LUKIN, B.A. London: E. & F. N. Spon. 1888.

Of what use is it to multiply books on the art of turning? The author supposes a critic

of his work asking such a question, and we do not find any very satisfactory answer in the little book in question. Indeed, Mr. Lukin does not take very high ground. He says:—"Just as a new shop is frequently opened in the midst of other old-established ones, and may, and very often does, obtain at least its fair share of patronage; so is our little, unpretending volume presented to the public, and asks very humbly a little of the patronage which the world of amateur turners is able to bestow."

There is not very much we can add to this in the way of criticism. The author appears to understand his subject so far, at least, as the necessities of the work go. He says what has been said dozens of times before, just no better and no worse than it has been said dozens of times before. The title-page informs us that there are 194 illustrations in the work. These are largely of the "catalogue block" order, and the name of the Britannia Company figures extensively in this connection. Turning to a chapter "On choosing a lathe," the Britannia Company again is the only firm we notice that is mentioned, and the reader might well suppose that this company stands alone, or, at any rate, is the only one worth mentioning as producing the tool necessary for the turner. We don't know whether there is any connection between this exclusiveness and the fact that the Britannia Company has thirty-one pages of advertisements at the end of the book, or whether it is merely coincidence. The Britannia Company, we think, has cause to be grateful to the writers of minor works on turning, for it appears to us that they—the Britannia Company—occupy a position out of all proportion to that they fill in the practical world of turning at large. We presume, of course, that the work in question is offered to the public by the author and publisher in good faith, and is not subsidised by any manufacturing firm. We find it difficult, however, to reconcile this view with the fact that the Britannia Company is the only firm of lathe-makers we have come across in the work. We do not pretend to have read the book through,—our criticism on such works being necessarily of the *ex pede* order from the limited space we can afford,—but we have looked in every place we thought likely to contain names of makers, and find nothing but "Britannia Company" throughout. We consider the fact creditable neither to the author or the publisher, and certainly it does not increase our confidence in the Britannia Company.

*Designing Wrought and Cast Iron Structures.* Part V. (Wrought-Iron Roof Truss and Cast-Iron Hollow Column). By HENRY ADAMS, M.Inst.C.E. London: 60, Queen Victoria-street.

THIS small pamphlet of thirty-two pages, with two large folding-plates, is stated by the author to complete the first of his series of notes on iron structures. To architects and others, requiring an elementary knowledge of ironwork, this series of notes will no doubt be very useful as an inexpensive book for reference. The price is not stated on the cover, but from page 18 we learn that the price of each part, post free, from the Author, 60, Queen Victoria-street, is 1s. 6d. Part V. is divided into two sections, and treats of the calculation and design of roof-trusses and cast-iron columns.

Section A deals with the graphic solution of the stresses required for the proper design of a roof truss of 45 ft. span; notice being given to various points requiring consideration. It is, however, to be regretted that the author has treated the wind pressure acting upon a roof as a vertical load, because this method is not so true as the now universally-accepted method of treating the wind as blowing horizontally, and dealing with its effect on the sloping surface accordingly. The latter plan gives very little extra work over the former method. In the early examples of iron roofs, when the theory was only partially developed, a vertical force was allowed to be assumed only as a substitute for the real wind pressure. Now the theoretical difficulties have been removed by experiment, and hence there is no reason any longer to adopt an erroneous method.

Section B is devoted to the investigation of the strength and design of a cast-iron hollow column, 15 ft. high, carrying a load of 30 tons. The author's comparison of the results obtained by several different formulae is very instructive, and the compilation in a single chapter most useful.



**Lathe Work: a Practical Treatise on the Tools, Appliances, and Processes employed in the Art of Turning.** By PAUL N. HASLUCK. London: Crosby Lockwood & Co.

This is a work on the art of turning, and must not be confounded with books on the turner's tools. It is for this reason, doubtless, that there is no illustration of a lathe amongst the fifty-one woodcuts by which the work is embellished. We are not disposed to find fault with this omission, as the illustrations of various parts that are given have the appearance of having been executed for the work. The author begins with a historical retrospect of the art of turning from Jeremiah the Prophet and the Egyptians down to the present day. The foot-lathe is next dealt with, and the method of using hand tools described. Then follow chapters on mounting work and fitting chucks, after which we get to the slide-rest section. The concluding chapters are on screw-cutting by self-acting motion, and on the screw-cutting lathe.

There is a good deal of information in the book which may be useful for beginners, and which is put forward in a clear manner.

## RECENT PATENTS.

### ABSTRACTS OF SPECIFICATIONS.

444, Backs of Fire-Grates, J. Hall.

The idea set forth in this specification is to make the backs of such a shape that each brick forms all three sides of the back of the grate. By using this shape, but of different depths from back to front, the grate may be made to project or to recede, or of any irregular form that may be desired.

741, Wood Laths, H. G. Gear.

The longitudinal edges of the laths made in accordance with this invention are grooved, and this gives a better hold of the plaster as it enters and fills in this groove on the edge. A hold of the plaster is obtained along the whole length of the lath, and thus a very perfect hold of the plastering material is maintained.

3,855, Window-Sashes, T. W. Jones and H. J. Brooks.

The object of this invention is to provide an arrangement of window sashes whereby they can be removed from their frames for cleaning, and replaced without difficulty by any unskilled person, the sash-frames being at the same time watertight. The sliding part, which is T form in section, is fixed at each side of the sash, and fastened by one or more keys, which fit into metal sockets to prevent war. The sliding bars travel up and down with each sash when the window is opened and closed. On the back of the sliding part a metallic eye is secured, to which is fixed the sash line, which travels over a sash-pulley affixed to the head of the frame. This allows both the cords, as well as the weights, to be out of sight, since the metallic eye projects through a slot in the sides, or what are generally used as pulley-sties, of the window frame, the cord at the sides being in the boxing of the frame.

7,027, Window-Fasteners, J. W. Wolloms.

Upon the piece of metal forming the usual catch a slot or recess is, according to this invention, cut out, in which is placed an independent self-acting catch, the top or upper surface of which, when in position, is flush with the flat surface of the ordinary catch. The underside of this independent catch is slightly rounded, or curved, to allow of the sliding arm riding freely, and being raised until it locks itself.

14,354, Manufacturing Cows, H. S., J. H., and G. S. F. Edwards.

Instead of forming the cows by hammering out the metal, they are, by this invention, pressed out by suitable stamps and dies operated by a machine hammer, which greatly simplifies and expedites the operation.

13,689, India-rubber Pipe-joints, I. B. Harris.

According to this invention the pipes are united by the flanges, and by being screwed through these flanges or collars; but between the joints a collar of hard rubber is introduced, making the joint tight and perfect. Several modifications for flexible and rigid tubes are described.

### NEW APPLICATIONS FOR PATENTS.

Nov. 30.—17,446, G. Humphry, Weather-bars, or Thresholds, for Doorsteps.—17,460, E. Partidge, Securing Door-knobs to their Spindles.—17,467, F. Chantrel and Others, Screwdrivers.  
Dec. 1.—17,495, J. Dismore, Incombustible Roof.—17,502, S. & W. Fisher, Telescoping Handle for Doors, &c.—17,525, B. Phillipson, Ventilation of Drains and Soil-pipes.—17,563, W. Lindsay, Fireproof Floors.

Dec. 3.—17,570, J. Carpenter, Sliding-sash Windows.—17,607, H. Fenton, Warming Rooms and Buildings.

Dec. 4, 17,641, J. Ogg, Cutting and Dressing Stone, &c.—17,665, J. Lauder, Clearing Drains.—17,693, R. Furstenberg, Roof Coverings.

Dec. 5.—17,746, W. Sturge, Ceiling Roses and other Electrical Fittings.—17,749, J. Reynier, Heating Buildings.—17,752, W. Millar, Ventilating Boarded Floors.

Dec. 6.—17,796, W. Roberts, Hanging Window-sashes.—17,817, R. Batey, Window-sash Fastener.—17,823, J. Carter, Water-closets.—17,829, T. Russell, Fireplaces.—17,836, C. Wuitton, T-Square.—17,839, J. Cole, Ventilating Sash-fastener.—17,841, E. Robbins, Cement or Concrete.—17,845, J. Corcoran, Heating Buildings, &c.

### PROVISIONAL SPECIFICATIONS ACCEPTED.

12,862, T. Parkes, Window-fasteners.—13,694, J. Brondy, Water-waste-preventing Syphon Cistern.—14,748, J. Youngson, Sash-fasteners.—15,152, J. Denham, Brick-machines.—15,223, S. Russell, Window Fastening.—15,267, H. Budge and F. Jackson, Device for Preventing the Opening of Doors.—15,441, F. Ran-ome, Furnaces for Burning Cement.—15,583, J. Bewick, Draught and Weather Exchangers for Doors.—15,536, R. Lyon, Brick-moulding Machine.—15,610, J. Rothwell, Ventilating.—16,560, W. Hester, Syphon Soil, Drain-pipes, &c.—16,753, A. Gray, Roman Cements, &c.—17,022, J. Howie, Syphon-Flushing Cisterns.

### COMPLETE SPECIFICATIONS ACCEPTED.

#### Open to Opposition for Two Months.

381, H. Romain, Preventing Draughts in Houses, &c.—1,442, W. Baird, Flushing Water-closets, &c.—1,612, W. Foulis, Fireplaces.—1,717, P. Clark, Fire-stoves for preventing Down Draughts in Chimneys.—2,641, W. Constable and J. Joseph, Artificial Stone.—2,955, A. Ford and E. Wright, Self-ventilating Sewer-pipe and Sewer Ventilation.—9,962, W. Cooper, Water-closet Structures.—11,889, E. Wilkinson, Window-fastener.—15,243, J. and W. Witte, Door-springs and Checks.—15,997, A. Bonly, Paint.

### RECENT SALES OF PROPERTY.

#### ESTATE EXCHANGE REPORT.

##### DEC. 3.

By ALFRED THOMAS PETER & MILES, Herts, near Bishop's Stortford—"The Furness Peabam Brewery," with plant and 28 acres; also eight ten freehold and copyhold public and beer houses ..... £18,200  
Dartford, near—"The Wilmington Brewery," with plant, &c., and five leasehold beer-houses ..... 5,500

##### DEC. 4.

By FULLER, HORSLEY, SONS, & CASSELL, Millwall, West Ferry-road—"The lease of the "Regent Dry Dock," term 27 years ..... 5,500

##### By DRIVER & PERFECT.

Holloway—80, Cottenham-road, 74 years, ground-rent £7 ..... 200

##### By MESSRS. FORTER.

Westminster—34 and 35, Marsham-street; 74, 76, and 78, Hornsey-road, 14 years, ground-rent £55 ..... 730

##### By ROGERS, CHAPMAN, & THOMAS.

Brompton—1, Beauchamp-place, 33 years, ground-rent £10 ..... 730

##### By ROSEWORTH & STEVENS.

Regent-street—7, Bank-street, 31 years, ground-rent £23, 10s ..... 1,700  
Connaught-square—72, Seymour-street, 20 years, ground-rent £9, 4s. 6d. .... 750  
Dorset-square—14, New-street, and stabling, 12 years, ground-rent £16 ..... 320

##### DEC. 5.

##### By WHITE, BRENT, & TAYLOR.

Lincoln's-Inn—7, New-square, freehold chambers ..... 3,500

##### By MESSRS. TROLLOPE.

Regent-street—11, Argyl-street, freehold ..... 4,180  
Walton-on-Thames—"The Oaklands Dairy Farm," 128a. 3r. 0p, freehold ..... 7,050

##### By M. MILLS.

Southwark-bridge-road—Ground-rent of £10, 10s, reversion in 11 years ..... 710  
Nos. 171, 173, 175, 179, and 181, Southwark-bridge-road, freehold ..... 2,810  
"The Old Justice" public-house, freehold ..... 1,760  
Nos. 143 to 197 odd, Southwark-bridge-road, freehold ..... 4,900  
"The Windsor Castle" public-house, freehold ..... 3,350  
Disney-street—"The Farm House," freehold ..... 2,060  
Harrow-street—Ground-rent of £13, reversion in 44 years ..... 305  
Little Lamb street—A freehold plot of land, area 3,200 ft. .... 950  
Nos. 25, 27, and 29, Lamb-street, freehold ..... 1,570  
The freehold licensed beer-house, 23, Lamb-street ..... 750

##### DEC. 6.

##### By MARCH, MUNCEY, & CO.

Upper Clapton—28, Sach-road, 97 years, ground-rent £5, 10s ..... 395

##### By DALE & SONS.

Mill End—4, Grafton-street, 51 years, ground-rent £4, 10s ..... 590

### By NEWBON & HARDING.

Holborn—The Lease of 288, High Holborn, term 34 years ..... £50  
Islington—35b, Gibson-square, 39 years, ground-rent £2 ..... 460  
269, New North-road, 39 years, ground-rent £8, 6s. Highbury—117, 119, and 121, Avenell-road, 93 years, ground-rent £22, 10s ..... 1,000  
Hoxton—2 to 8 even, Cusance-street, 14 years, ground-rent £30 ..... 40  
Canobury—8, No. 1 Hampton Park, 38 years, ground-rent 25s. 15s. 6d ..... 420  
Totterham Court-road—No. 15, freehold house and shop ..... 3,960  
Holloway—39, Loraine-road, freehold ..... 635  
Camden-town—165, Camden-road, 60 years, ground-rent £8, 5s. .... 1,000  
Richmond—1, Evelyn-terrace, 78 years, ground-rent £3 ..... 105

### By E. WOOD.

Hammer-smith—49, Cambridge-road, 58 years, ground-rent 7s. .... 300  
Stoke Newington—76, Fairholt-road, 30 years, ground-rent £7, 10s ..... 500  
Islington—85, Upper Winchester-street, 56 years, ground-rent £3 ..... 350  
South Horseay—49, Spencer-road, 64 years, ground-rent £5 ..... 150

### MEETINGS.

#### MONDAY, DECEMBER 17.

Royal Institute of British Architects.—Mr. John Belcher on "Musical Requirements in Church Planning." 8 p.m.  
Society of Arts (Cantor Lectures).—Captain W. de W. Abney, F.R.S., on "Light and Colour." IV. 8 p.m.

#### TUESDAY, DECEMBER 18.

Royal Statistical Society.—Mr. R. Giffen, LL.D., on "Recent Changes in Prices and Incomes Compared." 7.45 p.m.  
Institution of Civil Engineers.—Mr. J. A. F. Aspinall, on "The Friction of Locomotive Slide-valves," &c.; on "Birmingham Architectural Association." Mr. Whitworth Wallis on "Pompeian Art." 8 p.m.  
Glasgow Architectural Association.—Mr. R. C. Grant on "Joinery." 7.30 p.m.  
Manchester Architectural Association.—Mr. J. Corbett on "House Cold-water Supply Fittings." 7.30 p.m.

#### WEDNESDAY, DECEMBER 19.

Society of Arts.—Mr. W. J. Dibdin, on "Standards of Light." 8 p.m.  
Institution of Engineers.—Mr. S. J. Mackie, on "Some Matters Connected with the new Patent Bill," &c.; and on "Some Recent Inventions Suitable to the Household." 8 p.m.  
Civil and Mechanical Engineers' Society.—Mr. W. A. Eckersley on "The Oroya Railway in Peru." 7 p.m.  
Builders' Foremen and Clerks of Works' Institution. 8.30 p.m.  
Royal Meteorological Society.—Papers by Mr. C. Harding, the Rev. T. A. Preston, M.A., and Captain D. Wilson-Barker. 7 p.m.

#### THURSDAY, DECEMBER 20.

Sanitary Institute.—Mr. Ernest Hart on "The new Local Government Bill and the County Councils, especially in relation to Sanitary Administration." 4 p.m.  
Edinburgh Architectural Association.—Annual Dinner.

## Miscellaneous.

**Building in New York.**—The building season for 1888 in New York shows a great falling-off in the number and amount of new investments, compared with 1887. According to the statistics of the Bureau of Statistics, the number of buildings proposed in 1887 up to Oct. 31 was 3,951, of an estimated value of 62,941,072 dols. On Oct. 31 of the present year the total number of buildings proposed to be erected was 2,704, valued at 40,836,375 dols., thus showing a decrease of 1,277 buildings and 22,054,697 dols., as compared with last year. The decline is attributed wholly to over-building, more dwellings having been erected on the west side than there are people to occupy them. The outlook for 1889, therefore, is not promising.

**New Granaries and Warehouses at Brixton.**—An extensive range of buildings in Coldharbour-lane, near Loughborough Junction, covering an area of upwards of 8,000 ft., together with ten houses adjoining, were completed in March last for Messrs. Osborne & Young, corn and forage factors. A few evenings ago the proprietors gave a supper to all the buildings to testify to them their satisfaction at the manner in which they were carried out and completed. Mr. Cruwys, of Brixton-road, was the architect; and Mr. T. H. Rodwell, of Loughborough Junction, the contractor.

**Iron Buildings.**—Messrs. North & Son, constructors of iron buildings and roofing, have purchased property adjoining their present premises in London-road, Southwark, with a view to extending their workshops.

**Removal.**—Messrs. C. Isler & Co., artesian well engineers, late of 88, Southwark-street, have removed to more extensive premises, known as "Artesian Works," Bear-lane, Southwark.



### The New Harbour Works at Hamburg.

The new harbour works, docks, and depôts at Hamburg are just opened. The free harbour quarter, as it is called, is divided by the River Elbe into a northern and a southern part. The former consists of the City of Hamburg free harbour quarter, and embraces, besides a quantity of newly-constructed canals and streets, an area of 40,000 square metres entirely covered with huge warehouses. These buildings, all of which consist of vaults, counting-houses, and four stories above, are fitted with the most improved hydraulic lifts, and lighted entirely by the electric light. In order to clear this quarter, it was necessary to pull down 500 dwelling houses, inhabited by some 8,000 persons. The quays here, which were begun twenty years ago and are not finished yet, have a length of 8,000 metres, afford accommodation for 6,000 steamers, and are connected by a network of branch lines with the railway-stations in the town. The southern portion consists of the harbour for sailing ships, capable of accommodating a couple of hundred vessels, and a harbour for the coasting trade. The steam crane in the former harbour is capable of lifting 150 tons. Within this portion is also situated the great petroleum harbour and depôts,—the largest of its kind in the world,— whilst a great space of land is reserved for the further building of warehouses, dry docks, &c. The cost of all these works is estimated at 6,000,000*l.*, of which the German Empire contributes 2,000,000*l.* In order to maintain connection between the customs part of the town and the island in the Elbe a magnificent bridge has been built, which by its antique style is considered the handsomest in Germany. As a continuation of this bridge another is to be built across the Alter Hafen Canal which will admit of the passage of ships through the middle. The bridge across the Elbe built by the Cologne-Mindener Railway Company forms the limit of the Elbe Customs district to the south, and as the formerly free town of Altona is now absorbed in the Customs union, the future free harbour district of Hamburg consists solely of the River Elbe, commencing at the inner town and stretching to the railway-bridge in question.

### Sanitary Appliances and Fittings.

Messrs. Henry Conolly, Limited, of Hampstead-road, have just issued their revised catalogue of sanitary appliances and fittings, including every description of plumbers', engineers', and gasfitters' brasswork. It is a very well-got-up volume of more than 500 pages, very fully illustrated. The catalogue is to some extent encyclopædic within its own domain, for besides Messrs. Conolly's own excellent specialties in the way of water-closets and other appliances, the best forms of water-closets of various types by several other of the best makers are shown. But we are sorry to see the old pan-closet, with its abominable iron "container," finding a place in a catalogue of this kind. We suppose it will be urged that the pan-closet is still in demand on account of its cheapness, but we trust that before long it will disappear from the catalogue, and cease to be supplied by so reputable a firm as Messrs. Conolly. This appears to be the only blemish upon what is one of the completest and most useful of sanitary catalogues which we have seen for some time, and which is likely to be found of great service in all architects' and builders' offices,—appliances of all kinds, to meet every exigency of position, being figured in it.

**Building Land at Teddington.**—On Monday Messrs. Baker & Sons submitted for sale, at the Clarence Hotel, Teddington, forty-eight plots of freehold building land on the Ellersey Estate, described as "the choicest uncovered site in Teddington," and situated in the centre of the town, fronting on the main street, only three minutes' walk from the railway station. There was a numerous attendance at the sale. The several plots offered varied in their dimensions, having frontages of 15 ft., 18 ft., 24 ft., and 30 ft., with depths of from 50 ft. to 70 ft. Out of the entire number of sites submitted, eight were shop plots, and for all these there was a close competition. Upwards of three-fourths of the plots submitted, the smaller plots, having 15 ft. frontages, realised from 45*l.* to 50*l.* each, whilst those having frontages of 24 ft. and 30 ft. were sold for 100*l.* and 120*l.* each. A corner shop plot, having a frontage of 18 ft. to Broad-street and a return frontage of 71 ft. to Ellersey-road, was sold for 160*l.*

**Paris Exhibition, 1889.**—We are informed that Her Majesty, by Order in Council, has been pleased to declare that the conditions of the Patent Act, 1883, under which an application for a patent is not to be invalidated by the exhibition of an invention at an International Exhibition, are to apply to the Paris Universal Exhibition, and also that exhibitors are to be relieved from the conditions of the above Act, under which they were required to give notice to the Comptroller of Patents of their intention to exhibit the article afterwards sought to be patented. The regulations also apply to designs intended to be registered. It is also announced that in connexion with the Mansion House Committee for the British section of the Exhibition, a "Social Economy Committee" has been formed, for the purpose of obtaining a due illustration of the subject of Social Economy. The Committee includes the names of Mr. Ernest Hart (chairman), Sir V. Kennett-Barrington, Sir Sydney Waterlow, Sir Douglas Galt, Sir Henry Roscoe, Sir Philip Magnus, Messrs. W. Woodall, M.P., W. H. Pannell, J. G. Fitch, J. Furley, C. S. Loeb, H. Trueman Wood, and Louis Parkes, M.D. (hon. sec.). The subjects to be illustrated are chiefly as follows:—Industrial villages, trades unions, technical education, friendly societies, life assurance companies, savings banks, co-operative stores, industrial dwellings, working-men's clubs, temperance societies, coffee and vegetarian restaurants, protection of infant life, Factory Acts, baths and wash-houses, domestic hygiene, open spaces, hygiene of factories and workshops, employes' funds, home industries, labour, and emigration and immigration. It is stated that promises of assistance have been received from the Corporation of London, the City Commission of Sewers, and other public bodies, as well as from the leading authorities in the respective subjects named above. Models, plans, drawings, and literature will be included in the exhibit, which the Committee desire to be of national significance. Offers of assistance from individuals or societies connected with any of the above subjects will be cordially received by the Secretary of the Committee, at 2, Walbrook, E.C.

**Consecration of Ballynascreen Church, Drapers' Town, Diocese of Derry.**—The new church of St. Columba, Ballynascreen, has been consecrated. The church was begun two years ago, and stands upon the lines of the old external walls. The church now consists of a choir or chancel, 35 ft. long by 16 ft., with lateral aisles or transepts, and a short nave and south porch. The tower has been converted into a baptistery, and a lofty arch opened out on its western wall. To the south of the southern aisle is a lean-to aisle or ambulatory, which gives another entrance to the church. The vestry and its porch are placed in the north side. The chancel proper extends 10 ft. eastward of the transept arches, and is entirely reserved for the offices of the Holy Communion, while the floor is extended westward as far as the central columns of the transepts, and enclosed with a low stone curb. The church has been designed and carried out in every detail under the care of Mr. Thomas Drew, R.H.A., Diocesan Architect of Down, Connor, and Dromore. Mr. John McNally, of Cookstown, has been the contractor.

**The Mitcham Hall Estate.**—On Tuesday, Messrs. Lumley & Co. submitted for sale, at the Auction Mart, the Mitcham Hall Estate, in Surrey. The property was offered in consequence of the owner and occupier, Mr. Sydney Gedge, M.P., coming to reside in London. It was described as containing 17½ acres of freehold, and upwards of 1 acre leasehold, held for a term of 48 years from Christmas next, at a rental of 15*l.* a year. On bidings being invited, 10,000*l.* was offered, and 11,000*l.* having been reached without any further advance, the auctioneer reminded the company that the value of the land alone might be taken at something like 700*l.* or 800*l.* an acre, without taking into account the mansion itself. 12,000*l.* was eventually reached, and there being no further offers the auctioneer announced the reserve at 14,000*l.*

**Newgate.**—The City Lands Committee of the Corporation have just agreed unanimously (subject to the approval of the Home Secretary) to demolish Newgate Prison and the Central Criminal Court, and to erect upon the site a grand new Sessions House, suitable to the modern requirements, as well as a fine row of shops. —*Times*.

**The Law Courts Branch of the Bank of England.**—This new building, of which we gave a view in the *Builder* for May 21, 1887, is to be opened for business on Monday next. It is situated at the western end of Fleet-street, partly on the site of the famous "Cock" Tavern. There is a return frontage to Bell-yard, which intervenes between the bank and the clock-tower of the Law Courts, and which has been considerably widened. There is a large, lofty, and well-lighted "pay-hall" on the ground-floor, conveniently fitted up. Below this there are extensive and impenetrable strong-rooms for the storage of bullion. The massive steel-doors and interior-grilles of these chambers have been supplied by Messrs. Hobbs, Hart, & Co., the walls being massively built of hard blue Staffordshire bricks set in cement. The bullion lift, as well as the passenger and dinner lifts for the manager's or "agent's" residence, are by Messrs. Clark, Bunnell, & Co., the Bestwick folding iron doors being used to protect the entrances to passenger lift shaft. The wrought-iron entrance gate, external railings, staircase balustrade, and the ornamental ironwork generally, have been supplied by Messrs. Starkie, Gardner, & Co. The mosaic floors, &c., are by Messrs. Burke & Co., and the parquetry by Mr. Ebner. The sanitary appliances in the shape of lavatories, water-closets, baths, &c., are by George Jennings, the heating and ventilating arrangements being by Mr. Crittall. Warming is effected by hot-water coils. Mr. Elsley's apparatus is used for opening the windows of the "pay-hall," and the vitiated air is drawn off through apertures in the ceiling by means of the "diaphragm ventilator" invented by Mr. John Honeyman, architect, Glasgow, and fully described and illustrated in the *Builder* for Oct. 2, 1886. The electric lighting arrangements are by Messrs. Drake & Gorham. The grates in the residential portion are by Mr. Potter. Sequoia-wood is used for the doors, window-shutters, and other fittings in the principal rooms of the residential portion of the Bank. The constructional ironwork is by Messrs. Lindsay & Co., of Paddington. The large "pay-hall" is spanned by three large steel girders, carried on double I-I stanchions of 2 in. metal embedded in the walls. These girders carry a "pumice concrete" fire-proof floor, constructed in accordance with Messrs. Lindsay's system, as shown in fig. 1 of their sheet of diagrams (of which, by the way, they have just issued a new edition). The joists, together with the interlacing trussed rods, support and are completely embedded in the concrete. The three steel girders referred to carry the 9 in. brick walls of the corridors, and the partition walls between the rooms, of the three residential floors above the Bank proper. The architect of the building is Mr. A. W. Blomfield, A.R.A., and the clerk of works has been Mr. Fisk. The general contractors were Messrs. Dove Bros., Mr. James Gregory being their resident foreman.

**The English Iron Trade.**—The English iron market is steady, and prices are firm. The trade in pig-iron is not over active, but makers are not at all anxious to do forward business, believing in the advent of higher values. There has not been much change in any of the pig-iron markets, not even in Scotch warrants. Hematite iron is still brisk. The finished iron market also shows no material change, being steady, and prices firm. A fresh fillip has been given to the steel market by the placing of large contracts for rails, additional heavy orders having been secured this week. The call for shipbuilding steel is now so heavy that makers in the north-west have been able to advance their quotations 12*s.* 6*d.* a ton. From this it follows that the demand for new ships is still good, yards being meanwhile as busily engaged as the short days will permit. Engineers are also very busy.—*Iron*.

**The London Central Winter Fund of House Decorators and Painters.**—We are asked to say that, by the kind permission of Miss Grace Hawthorne, the ticket benefit at the Royal Princess's Theatre in aid of the above fund, which we mentioned a week or two since, has been extended to all performances to December 24, 1888. "Hands Across the Sea" will be played each evening and on Saturday afternoons. The fund was formed in 1874, for the purpose of paying a small sum weekly to its members when unemployed during the winter. Tickets only will benefit the fund; they will be sent, post-free, on receipt of postal-order or stamps, by Mr. E. W. Blades, secretary, 28, Longford-street, Albany-street, N.W.



**Church of St. Mary Magdalene, Wandsworth.**—The permanent church of St. Mary Magdalene, Wandsworth Common, has lately been consecrated. The portion of the building at present finished comprises a nave, 28 ft. wide and 84 ft. long, with lofty clear story and lean-to aisles, 11 ft. 6 in. wide, but on the north side, owing to the church school encroaching on part of the site, only two bays of the whole width of the aisle have been erected. In consequence of the nearness of adjoining buildings, there are no side windows to the aisles, the walls of which are divided into many panels, somewhat ornamentally treated at the heads, the divisions being formed by brick piers. There is a dado of red bricks under, surmounted by a bluish brick string-course. One of the aisle panels is filled with a representation of the Ascension, designed by Mr. Tinworth, and executed by Messrs. Doulton & Co., an instalment of a complete series of Scriptural subjects in terra-cotta. The north porch (with a kind of parvise over), the chancel, organ-chamber, and vestries have not yet been built, though the chancel arch has been temporarily filled in. At the west end is a lofty gabled bell-turret, containing two large and one small bells from the foundry of Messrs. Warner & Sons. The turret is of substantial thickness, and well buttressed under, as it was necessary to get in a considerable amount of light in the west nave wall, which has three lofty two-light windows, besides a rose-window. The base of the bell-turret is partly corbelled over in massive stones above the latter. There are five bays to the nave, a temporary chancel arrangement of wood being formed in the two eastern bays, divided from the nave by a lofty wrought-iron screen, surmounted by a floriated cross. This was executed by Mr. T. J. Gawthorpe, of Long-acre. The nave and aisle roofs are of fir timber, with very substantial trusses, those to the nave being of queen-post form, adapted to a high-pitched roof, and ornamentally treated. There are no intermediate trusses, the purlins being of additional strength in consequence, and the roof boarded and panelled to the under-side of the common rafters, with a view to ultimate decoration in colour. The windows are glazed with ornamental lead quarries of cathedral rolled glass of various tints mixed with clear white glass. The clearstory windows can all be opened simultaneously on Elsie's system. The piers carrying the nave arcade are of Pennant stone, the main walls of grey stock bricks with red brick (from Bracknell) bands of dressings. Doulton stone externally and Westwood ground Bath-stone internally have been sparingly used. The area for seats is paved with solid wood blocks, and ultimately the passages will be laid with encaustic tiles. The hot-water warming arrangements are by Messrs. Rosser & Russell, the gas-fitting by Mr. John Court of Brompton-road. The contractor is Mr. B. E. Nightingale, of Albert Embankment, and the architect Mr. B. Edmund Perrey, F.S.A. The church will at present accommodate about 420. The clerk of works was Mr. J. Gard.

**Railway in Honduras.**—Tenders are invited by the Crown Agents for the Colonies, on behalf of the British Honduras Government, for the construction, equipment, maintenance, and working of a railway, upon the land grant system, and of a landing pier at Belize. The line, ninety miles in length, will run from Belize towards the western frontier, and the contractor will be required to obtain a concession from the government of Guatemala for powers to extend the line into the latter territory; he will also be required to introduce 1,000 immigrants into the colony of Honduras. The Honduras Government is prepared to grant, by way of subsidy, land at the rate of 5,000 acres per mile of railway, and to pay, in instalments, a sum of 500,000l. towards the undertaking, but all preliminary surveys must be made at the contractor's expense.

## PRICES CURRENT OF MATERIALS.

| TIMBER.                      | £. s. d. | £. s. d. |
|------------------------------|----------|----------|
| Greenheart, B.G. .... ton    | 6 10 0   | 7 10 0   |
| Teak, E.I. .... load         | 8 0 0    | 14 0 0   |
| Sesuvium, U.S. .... do       | 2 0 0    | 3 0 0    |
| Asi. Canada, .... load       | 3 10 0   | 6 0 0    |
| Birch " " " " " " " "        | 3 10 0   | 6 0 0    |
| Elm " " " " " " " "          | 4 0 0    | 5 0 0    |
| Fir, Dautsch, &c. .... do    | 2 0 0    | 4 0 0    |
| Oak " " " " " " " "          | 2 0 0    | 4 0 0    |
| Canada " " " " " " " "       | 5 10 0   | 7 0 0    |
| Fine, Canada, red " " " "    | 3 0 0    | 4 0 0    |
| " " " " " " " " yellow       | 3 10 0   | 5 10 0   |
| Lath, Dautsch " " " " fathom | 4 0 0    | 6 10 0   |
| St. Petersburg " " " " " "   | 5 10 0   | 7 10 0   |

| TIMBER (continued).                           | £. s. d. | £. s. d. |
|-----------------------------------------------|----------|----------|
| Waincoat, Riga, &c. .... log                  | 2 15 0   | 4 5 0    |
| " " " " " " " " Odessa, crown                 | 2 15 0   | 3 5 0    |
| Deals, Finland, 2nd and 1st std. 100          | 9 0 0    | 10 0 0   |
| " " " " " " " " 4th and 3rd                   | 7 0 0    | 8 10 0   |
| Riga " " " " " " " "                          | 7 0 0    | 8 0 0    |
| St. Petersburg, 1st yellow                    | 10 0 0   | 15 0 0   |
| " " " " " " " " 2nd                           | 9 0 0    | 10 0 0   |
| " " " " " " " " white                         | 8 0 0    | 10 10 0  |
| Swedish " " " " " " " "                       | 7 10 0   | 18 0 0   |
| White Sea " " " " " " " "                     | 8 10 0   | 17 0 0   |
| Canada, Pine, 1st                             | 7 0 0    | 26 0 0   |
| " " " " " " " " 2nd                           | 11 0 0   | 17 0 0   |
| " " " " " " " " 3rd, &c.                      | 7 10 0   | 10 10 0  |
| " " " " " " " " Spruce, 1st                   | 9 10 0   | 10 10 0  |
| " " " " " " " " 2nd                           | 7 0 0    | 8 10 0   |
| New Brunswick, &c.                            | 6 15 0   | 8 15 0   |
| Battens, all kinds                            | 5 10 0   | 12 0 0   |
| Flooring Boards, sq., 1 in., prepared, First  | 0 11 0   | 0 14 6   |
| Second                                        | 0 8 0    | 0 10 9   |
| Other qualities                               | 0 6 0    | 0 7 9    |
| Cedar, Cuba, .... foot                        | 0 0 34   | 0 0 44   |
| Honduras " " " " " "                          | 0 0 34   | 0 0 44   |
| Australian " " " " " "                        | 0 0 3    | 0 0 34   |
| Mahogany, Cuba                                | 0 0 44   | 0 0 54   |
| Equine Stale, Colo Stale, &c., at Scarborough | 0 0 44   | 0 0 54   |
| St. Domingo, cargo average                    | 0 0 44   | 0 0 54   |
| Mexican " " " " " "                           | 0 0 44   | 0 0 54   |
| Tobacco " " " " " "                           | 0 0 44   | 0 0 54   |
| Honduras " " " " " "                          | 0 0 44   | 0 0 54   |
| Box, Turkey, &c.                              | 5 0 0    | 12 0 0   |
| Walnut, Italian                               | 0 0 44   | 0 0 64   |

| METALS.                                  | £. s. d. | £. s. d. |
|------------------------------------------|----------|----------|
| Iron—Bar, Welsh, in London               | 4 17 6   | 5 0 0    |
| " " " " " " " " Wale                     | 4 7 6    | 4 10 0   |
| " " " " " " " " Staffordshire, in London | 5 15 0   | 7 0 0    |

| METALS (continued).     | £. s. d. | £. s. d. |
|-------------------------|----------|----------|
| COPPER—                 |          |          |
| British, cake and ingot | ton      | 80 0 0   |
| Best selected           | 80 10 0  | 0 0 0    |
| Sheets, strong          | 84 0 0   | 86 0 0   |
| Chili, bars             | 78 0 0   | 0 0 0    |
| YELLOW METAL—           |          |          |
| lb.                     | 0 0 74   | 0 0 74   |
| LEAD—                   |          |          |
| Pig, Spanish            | ton      | 12 15 0  |
| English, common brands  | 13 0 0   | 0 0 0    |
| Sheet, English          | 14 0 0   | 0 0 0    |
| SPLITS—                 |          |          |
| Silesian, special       | ton      | 18 12 6  |
| Ordinary brands         | 18 10 0  | 18 12 6  |
| TIN—                    |          |          |
| Straits                 | ton      | 99 0 0   |
| Anstralian              | 99 0 0   | 0 0 0    |
| English Ingots          | 102 0 0  | 0 0 0    |
| ZINC—English sheet      | ton      | 22 10 0  |
| OILS.                   |          |          |
| Linseed                 | ton      | 18 5 0   |
| Cocanut, Cochui         | 28 10 0  | 29 10 0  |
| Ceylon                  | 27 0 0   | 0 0 0    |
| Palm, Lagos             | 58 0 0   | 23 10 0  |
| Rapeseed, English pale  | 31 10 0  | 0 0 0    |
| " " " " " " " " brown   | 30 0 0   | 0 0 0    |
| Cottonseed, refined     | 23 10 0  | 0 0 0    |
| Tallow and Oleine       | 19 0 0   | 45 0 0   |
| Lubricating, C.S.       | 5 0 0    | 8 0 0    |
| " " " " " " " " refined | 7 0 0    | 12 0 0   |
| TURPENTINE—             |          |          |
| American, in casks      | 1 14 0   | 0 0 0    |
| Tax—Stockholm           | 1 8 1    | 1 9      |
| Archeangel              | 0 12 0   | 0 12 6   |

## CONTRACTS, AND PUBLIC APPOINTMENTS.

Epitome of Advertisements in this Number.

## CONTRACTS.

| Nature of Work, or Materials.                 | By whom required.           | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-----------------------------------------------|-----------------------------|-----------------------------------|--------------------------|-------|
| Granite, Flints, and Slag                     | Acton Local Board           | C. N. Lally                       | Dec. 18th                | xi.   |
| Locelling Recreation Ground                   | Brentford Local Board       | Mr. Lacey                         | do                       | ii.   |
| Equine Stale, Colo Stale, &c., at Scarborough | North-Eastern Railway       | Wm. Bell                          | Dec. 19th                | xiii. |
| " " " " " " " " 1st Vans and arts             | Wile End Vestry             | Official                          | do                       | xiii. |
| Chimney Shafts and Furnaces                   | do                          | J. M. Knight                      | do                       | xiii. |
| New Wing to Infirmary                         | Woolwich Union              | J. O. Cook                        | Dec. 20th                | xiii. |
| Widening Bridge, Congleton                    | County of Chester           | S. Bull                           | do                       | xiii. |
| Street Lighting                               | Finchley Local Board        | G. W. Bramall                     | Dec. 21st                | ii.   |
| Public Market Hall                            | Rotherham Corporation       | A. Neill                          | Dec. 28th                | xiii. |
| New Water Heating Apparatus                   | Durham Union                | W. Crozier, Jun.                  | do                       | xiii. |
| New Bridge and Removal of Existing Bridge     | Glasgow, Hillhead, &c.      | Joint Bridge Com.                 | do                       | ii.   |
| Steam Cooking Apparatus                       | Thakeham Union              | Official                          | do                       | xiii. |
| Alteration at Cemetery                        | Com. of H. M. Yorks.        | do                                | Jan. 1st                 | xiii. |
| Recessing Gates, Finsbury-park                | Paddington Burial Board     | F. W. M. King                     | Jan. 3rd                 | xiii. |
| Formation of G.avel P-th, Remington-park      | Met. Board of Works         | Official                          | Jan. 8th                 | ii.   |
| Gravel Footpath, &c., Ravenscourt-park        | do                          | do                                | do                       | xi.   |
| Repairs, Victoria-park                        | do                          | do                                | do                       | xi.   |
| Construction, Equipment, &c., of Railway      | British Honduras            | do                                | April 8th                | ii.   |
| Eding School, &c., Newcastle-on-Tyne          | War Department              | do                                | Not stated.              | ii.   |
| Barracks Buildings (various towns)            | do                          | J. W. Dunford                     | do                       | xiii. |
| Removal and Re-erection of Hall, Walthamstow  | F. H. Morris, Esq.          | do                                | do                       | xi.   |
| New Church, St. John's, Carmarthen            | Middletown, Prothero, & Co. | do                                | do                       | xi.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment.           | By whom Advertised.   | Salary.    | Applications to be in. | Page. |
|----------------------------------|-----------------------|------------|------------------------|-------|
| Clerk of the Works               | Rotherham Corporation | 3l. a week | Dec. 17th              | xvi.  |
| Assistant Surveyors, R. E. Dept. | Civil Service Com.    | Not stated | Jan. 4th               | xvi.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursday.]

|                                                                                                                                                                       |            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>BEDFORD.</b> —For proposed villa residence, Goldington-road, Bedford, for Mr. E. W. Perry. Mr. James Hall, architect and surveyor, 17, St. Paul's-square, Bedford. |            |
| Poster                                                                                                                                                                | £1,171 0 0 |
| Haynes                                                                                                                                                                | 1,098 0 0  |
| Knight                                                                                                                                                                | 1,099 0 0  |
| Richardson                                                                                                                                                            | 1,080 0 0  |
| Laughton                                                                                                                                                              | 1,055 0 0  |
| Morton                                                                                                                                                                | 1,050 0 0  |
| White                                                                                                                                                                 | 1,040 0 0  |
| Smith                                                                                                                                                                 | 1,040 0 0  |

|                                                                                                                                                              |          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>BLACKHEATH.</b> —For the erection of a cricket pavilion near the Manor Way, for Mr. Geo. Valentine. Mr. B. Walsh W. Adlam, architect, 33, Walbrook, E.C.— |          |
| G. Davenport                                                                                                                                                 | £260 0 0 |
| Kennard Bros.                                                                                                                                                | 227 10 0 |
| H. L. Holloway                                                                                                                                               | 214 0 0  |
| G. P. Havell (accepted)                                                                                                                                      | 208 0 0  |

|                                                                                                                                                                                                                                                                                       |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>BURY ST. EDMUNDS.</b> —For the erection and completion of Salvation Army barracks buildings at Bury St. Edmunds, for General Booth. Seating capacity, 700. Estimates include lighting, heating, and fencing. Mr. J. Williams Danford, architect, 101, Queen Victoria-street, E.C.— |          |
| J. Robinson, Jun., Bury                                                                                                                                                                                                                                                               | £715 0 0 |
| Pemph Jones Bros., Cambridge                                                                                                                                                                                                                                                          | 698 0 0  |
| J. Robinson, Sr., Bury                                                                                                                                                                                                                                                                | 595 0 0  |
| D. Ellwood & Son, Sandy                                                                                                                                                                                                                                                               | 679 0 0  |
| W. Sortwell, Harlow                                                                                                                                                                                                                                                                   | 573 10 0 |
| S. Hipsley, W. Wick                                                                                                                                                                                                                                                                   | 558 10 0 |
| F. J. Coxhead, Leytonstone                                                                                                                                                                                                                                                            | 544 0 0  |
| Alderton & Wheeler, Cambridge                                                                                                                                                                                                                                                         | 510 0 0  |

|                                                                                                                                            |          |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>COWFOLD (Sussex).</b> —For removal and re-erection of wooden farm buildings. Mr. Frederick Wheeler, architect, &c. P. Peters (accepted) |          |
|                                                                                                                                            | £276 0 0 |

|                                                                                                                                                                                                                                 |        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| <b>COWFOLD (Sussex).</b> —For alterations and additions to Waltham Manor, Cowfold, Sussex. Mr. Fredk. Wheeler, architect, 22, Chancery-lane, W.C. Quantities by Messrs. Evans & Deacon, 1, Adelaide-street, Charing-cross, S.W. |        |
| Stone facing                                                                                                                                                                                                                    | £4,974 |
| Brook facing                                                                                                                                                                                                                    | £4,896 |
| Cottages                                                                                                                                                                                                                        | £2884  |
| Hill Bros.                                                                                                                                                                                                                      | 4,897  |
| Geo. H. Gibson                                                                                                                                                                                                                  | 4,817  |
| Maides & Harper                                                                                                                                                                                                                 | 4,887  |
| Geo. Shaw                                                                                                                                                                                                                       | 4,440  |
| G. Jarvis Smith                                                                                                                                                                                                                 | 4,396  |
| Foster & Dismore                                                                                                                                                                                                                | 4,337  |
| J. Potter                                                                                                                                                                                                                       | 4,330  |
| P. Peters (stone)*                                                                                                                                                                                                              | 3,781  |

|                                                                                                                                                              |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>FELIXSTOWE (Suffolk).</b> —For erecting two houses and shops, for Mrs. Finlay and Miss Hall. Mr. John Shewell Cordier, architect, 9, Thoro-faro, Ipswich— |            |
| Bennett                                                                                                                                                      | £1,460 0 0 |
| Girling                                                                                                                                                      | 1,450 0 0  |
| Ward                                                                                                                                                         | 1,397 0 0  |
| Grinwood                                                                                                                                                     | 1,295 0 0  |
| Durran                                                                                                                                                       | 1,229 12 9 |

\* Accepted subject to certain deductions.

|                                                                                                                                                                                                                         |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>KEITH, N.B.</b> —Accepted for rebuilding parts destroyed by fire on Sept. 30, and for completing the clock tower at Institute Buildings, Mill-street, for the Directors. Mr. F. D. Robertson, Eile-Kelth, architect. |  |
| Mason's Work—Alexander & Son, Portree.                                                                                                                                                                                  |  |
| Carpenter's Work—G. & R. Cameron, Keith.                                                                                                                                                                                |  |
| Slater's Work—A. & R. Wright, Keith.                                                                                                                                                                                    |  |
| Plasterer's Work—G. McKay, Keith.                                                                                                                                                                                       |  |
| Plumber's Work—R. R. Raithe, Keith.                                                                                                                                                                                     |  |
| Painter's, &c., Work—M. McCannachie, Keith.                                                                                                                                                                             |  |
| Rooflights and Glazing—Rendle & Co., London.                                                                                                                                                                            |  |
| Heating Engineer—J. Taylor, Aberdeen.                                                                                                                                                                                   |  |

[Amount of a rejected tenders, exclusive of gas-lamps and brackets, for rebuilding burnt parts, £1,227, 16s. 9d.]



**HARLESDEN.**—For new wing to manager's cottage at Messrs. Welford & Sons' Dairy Homestead, Harlesden. Messrs. Purves & Done, architects.

|                         |          |
|-------------------------|----------|
| Langley & Pinkham ..... | £994 0 0 |
| W. Goodman .....        | 996 0 0  |
| W. M. Dabbs .....       | 919 0 0  |
| Oldrey & Co. ....       | 923 0 0  |
| Martin & Wells .....    | 900 0 0  |
| Allen & Sons .....      | 895 0 0  |
| W. A. Proctor .....     | 830 0 0  |

**LAMBETH.**—Tenders for new reading-room and alterations to Lambeth Boys' Schools, Hercules-buildings. Messrs. Waring & Nicholson, architects, 65, Parliament-street.

|                                 |          |
|---------------------------------|----------|
| Ford & Sons .....               | £138 0 0 |
| W. & F. Croaker .....           | 496 0 0  |
| Laphorne & Co. (accepted) ..... | 426 0 0  |

**LONDON.**—For rebuilding Chubb's "Royal Hotel," Rupert street, W., for Mr. Joseph Challis. Mr. John Waltram, surveyor, 18, Craven-street, Charing-cross, W.C. Quantities supplied by Mr. Geo. Hackford, 6, Queen Anne's-gate, S.W.:

|                                                                                                  |            |
|--------------------------------------------------------------------------------------------------|------------|
| Contract No. 1, exclusive of fittings.                                                           |            |
| Patman & Fotheringham (accepted) £11,583 0 0                                                     |            |
| For <i>Constructive Ironwork and Fireproof Floors, &amp;c., in the above-mentioned building.</i> |            |
| Dennett & Ingle (accepted) .....                                                                 | £1,383 0 0 |

**LONDON.**—For erecting proposed station in Draycott-place, for the Chelsea Electricity Supply Company (Limited). Mr. Fredk. G. Knight, architect, 8, Great Collyer-street, Westminster:

|                               |            |
|-------------------------------|------------|
| Foster, Digby, & Co. ....     | £9,700 0 0 |
| Simpson & Son .....           | 7,594 0 0  |
| Higgs & Hill .....            | 7,329 0 0  |
| C. Kynoch & Co. ....          | 7,170 0 0  |
| Langdale, Hullett, & Co. .... | 7,000 0 0  |
| Simpson & Co. ....            | 6,890 0 0  |

**LONDON.**—For rebuilding No. 131, Finsbury-pavement, E.C., for Messrs. Warner Bros. Mr. H. Dawson, architect, 46, Finsbury-pavement:

|                       |            |
|-----------------------|------------|
| King Bros. & Co. .... | £2,950 0 0 |
| Ashby & Horner .....  | 2,790 0 0  |
| Kynoch & Co. ....     | 2,759 0 0  |
| Laurence & Son .....  | 2,598 0 0  |
| Allen & Son .....     | 2,579 0 0  |
| Colls & Son .....     | 2,532 0 0  |
| J. Woodward .....     | 2,420 0 0  |

**LONDON.**—For restoration after fire of 25, Commercial-street, Whitechapel, E., for Messrs. Konigsberg & Sons. Messrs. C. Stanger & Sons, architects and surveyors, 21, Finsbury-pavement, E.C.:

|                     |            |
|---------------------|------------|
| Colls & Son .....   | £1,410 0 0 |
| Adamson & Son ..... | 1,383 0 0  |
| Perry & Co. ....    | 1,315 0 0  |
| Scherin .....       | 1,283 0 0  |
| O. Craske .....     | 1,239 0 0  |
| J. A. Taylor .....  | 1,109 0 0  |
| W. Gladding .....   | 1,084 0 0  |
| Green & Lee .....   | 1,074 0 0  |

**LONDON.**—For the erection and completion of a Salvation Army cheap food depot, in Burne-street, Edgware-road, for General Booth. Mr. J. Williams Dunford, architect, 101, Queen Victoria-street, E.C.:

|                                           |            |
|-------------------------------------------|------------|
| Henley & Co., Nunhead .....               | £1,198 0 0 |
| E. Chubb, Southgate-road .....            | 1,018 0 0  |
| T. Kearny, New Southgate .....            | 963 10 0   |
| J. G. Smith & Co., Hackney .....          | 951 0 0    |
| E. Lake, Hackney .....                    | 915 0 0    |
| F. Gladwell, H. russey .....              | 897 15 0   |
| W. Toot, Hendon .....                     | 895 19 0   |
| A. Brickell, West Kensington .....        | 880 0 0    |
| J. M. Godwin, Kilburn .....               | 854 0 0    |
| D. Doubleday & Son, King'sland-road ..... | 853 0 0    |
| Bray & Pope, Paddington .....             | 798 0 0    |
| F. J. Coxhead, Leytonstone .....          | 777 0 0    |
| A. Martin, Battersea .....                | 750 0 0    |

**LONDON.**—For sundry alterations and repairs to Nos. 431 and 433, Commercial-road, E., for the Tower Hamlets Co-operative Society, Limited. Messrs. Clarkson, architects, 146, High-street, Poplar, E.:

|                   |            |
|-------------------|------------|
| Curtis .....      | £1,347 0 0 |
| Holloway .....    | 1,372 0 0  |
| Wood .....        | 949 0 0    |
| George Lusk ..... | 830 0 0    |
| Croft .....       | 819 0 0    |
| Ho land .....     | 750 0 0    |
| Walker .....      | 699 0 0    |
| Lubin .....       | 670 0 0    |
| Salt .....        | 647 0 0    |
| 199 .....         | 633 0 0    |

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|                                   |          |
|-----------------------------------|----------|
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| Macfarlane Bros. (accepted) ..... | 243 0 0  |
| J. Claverley .....                | 225 0 0  |

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|                                   |          |
|-----------------------------------|----------|
| Gibbin & Son .....                | £555 0 0 |
| Nunn, E. Z. ....                  | 497 0 0  |
| Head, W. B., & Son .....          | 340 0 0  |
| Macfarlane Bros. (accepted) ..... | 328 0 0  |

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|                      |          |
|----------------------|----------|
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| Drew & Cadman .....  | £380 0 0 |
| Dearing & Sons ..... | 350 0 0  |
| H. Bradley .....     | 348 0 0  |
| Bradford .....       | 345 0 0  |
| G. Hockett .....     | 330 10 0 |

A. With bakehouse and oven.  
B. Bakehouse and oven omitted.  
\* Accepted.

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|-------------------------------------|----------|
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| Bate & Son, Dudley .....            | 491 0 0  |
| Brooks & Son, Lye .....             | 485 0 0  |
| Coxhead, Leytonstone .....          | 444 0 0  |
| Horton (late), Brierly Hill .....   | 444 0 0  |
| Alderton & Wheeler, Cambridge ..... | 429 0 0  |
| Tibbets, jun., Dudley .....         | 425 0 0  |
| Wale & Co., Ludlow (accepted) ..... | 415 0 0  |

**ST. LEONARDS-ON-SEA.**—For corner-house and adjoining house at Western-road, St. Leonards-on-Sea, for Mrs. G. J. Mills. Mr. Arthur Wells, 35, Havelock-road, Hastings, architect:

|                              |            |
|------------------------------|------------|
| H. E. Crutenden .....        | £2,904 0 0 |
| Chas. Hughes .....           | 2,868 0 0  |
| P. Jenkins .....             | 2,870 0 0  |
| A. H. White .....            | 2,870 0 0  |
| C. & E. Harman .....         | 2,770 0 0  |
| W. W. Smith (Worthing) ..... | 2,737 0 0  |
| Ridridge & Crutenden .....   | 2,700 0 0  |
| Taylor Bros. ....            | 2,675 0 0  |

\* The rest of Hastings and St. Leonards.  
*Alternative Estimates for Corner House and Three Adjoining Houses similar to one another.*

|                                       |            |
|---------------------------------------|------------|
| H. E. Crutenden .....                 | £5,187 0 0 |
| C. Hughes .....                       | 5,060 0 0  |
| P. Jenkins .....                      | 5,720 0 0  |
| A. H. White .....                     | 5,050 0 0  |
| C. & E. Harman .....                  | 4,810 0 0  |
| W. W. Smith, Worthing .....           | 4,602 0 0  |
| Taylor Bros. ....                     | 4,939 0 0  |
| Ridridge & Crutenden (accepted) ..... | 4,628 0 0  |

\* The rest of Hastings and St. Leonards.

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|                          |          |
|--------------------------|----------|
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| Kenny .....              | 327 0 0  |
| Bennett (accepted) ..... | 328 0 0  |

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# The Builder.

Vol. LV. No. 2384.

SATURDAY, DECEMBER 22, 1883.

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### The Application of Ornament.



**T**HIS small book\* forms the third of a series of text-books of ornamental design by the same author, the other two of which we have noticed as they appeared. These

former books treated of the rudimentary lines on which ornament may be designed and distributed. The present book treats of ornament in relation to practical conditions, in regard to the position it occupies and the material in which it is worked.

We have now arrived so far at a consensus of feeling and critical opinion in regard to the principles and functions of decorative art, that every one who has paid any attention to the subject knows pretty well what line will be taken by any competent artist and critic in regard to main principles. Thus the advice and opinions embodied in Mr. Day's short treatise are only what we are prepared to hear, and what we have heard from various other writers already. This detracts, no doubt, from the novel interest which a book like Mr. Day's may yet have for those who are still in the Court of the Gentiles; but it is not otherwise a matter for regret, but rather for satisfaction, as indicating that we are at last arriving at something like a common ground, and of generally-admitted faith and practice in regard to decorative art. And every man has his own way of putting and of illustrating things, and his own minor points to enforce.

Mr. Day, for instance, commences by some remarks which form a kind of note of interrogation placed against that now much-worn word "conventional," pointing out that it does not literally mean what it is now almost universally taken to mean, and that in France it is used in a quite different and even contemptuous sense, as implying a kind of scholastic mannerism. We quite agree with the author that "conventional" is not, etymologically speaking, the correct word to use for the process or condition of design to which we apply it; but we do not know that there is any other word in the language which expresses the meaning any more precisely. Mr. Day suggests "apt," which

strikes us as very bald and incomplete. A better word is the French "choisi," which, of course, has a shade of meaning quite distinct from that of "chosen" in English,—though we have seen the latter expression used, half-playfully, by an English writer on art. But, in fact, the idea implied in "conventional" is a modern one; the thing, of course, was *done*, ages ago, but the theory on the subject is modern, and we had to find a word for it. "Conventional" stood ready, a fine-sounding word, with just sufficient etymological suitability about it to justify its application, and we have seized on it, and poured new meaning into it. We cannot get rid of it now; nor can we agree with the author that there is any confusion as to its signification. He says, "What a flood of light would be let in upon the question of decorative design, could we but agree amongst ourselves as to what is meant by the term 'conventional.'" We do not agree at all in this. We believe that "conventional" conveys, to the minds of all who have studied or thought about art at all, a perfectly clear and distinct mental idea: only different persons who might try to define the idea in other terms would probably vary their terms a good deal, because the idea is one difficult to express in words at all. The word "conventional" is, in fact, a kind of shorthand sign for a somewhat complicated mental perception, about the nature of which there is, we believe, no doubt or difference among those who have it: the difficulty is to convey it to those who have not.

The special quality about Mr. Day's text-books is not that they tell us anything which has not been told before, but that they are so well and aptly illustrated, and illustration is the soul of a book on this kind of subject. Plate 2, with the naturalistic human figures in a sixteenth-century German wall-paper repeated symmetrically opposite to each other, says more than pages of discourse would convey as to the radical unsuitability of thus turning the realistic nude figure into a repeating ornament. The following considerations, however, will bear quotation:—

"Presumably the reason for introducing figures into ornamental design is for the sake of some added interest there may be in them. But you cannot get up any absorbing interest in a series of figures all identically of one pattern. They suggest only the mechanism employed in producing them. The multiplication of the figures, far from multiplying its interest, diminishes it in proportion to the number of times it is repeated; and, though it be a very good thing that is repeated, the case is

not greatly mended,—it is so easy to have too much of a good thing.

The only safety is in toning down the repeated form until its recurrence ceases to be very obvious. This may be effected in various ways. In certain embossed leather and such-like designs, it is brought about partly by the low relief of the stamping, partly by the softness of the colouring, and partly by a more or less cunning complication of the figures with the rest of the design, so that they do not throw themselves into notice. That variety in the creatures, were it possible, would be desirable, no one can doubt."

In pursuance of this idea the author gives us an example of a German pattern of rich though not well-designed scroll-work, in which animal figures are introduced, symmetrically placed as to position, but varied in detail and in action. If, however, this is meant as one section of a repeating pattern, we question whether anything is gained by this partial variation, which can only be carried out within the limits of the "repeat." If a pattern is to be repeated, we should say that it is better to treat it as a purely artificial thing in every detail. The sight of two animal forms in varied attitude and action is all very well as long as we only look at one repeat; but when we find the same semblance of naturalistic action repeated at regular intervals all over the surface decorated, we only feel as if the designer had made a futile effort, in this way, to cheat us into a momentary belief that this was a hand-drawn design with no repetition.

As to the chapter on "Where to stop in ornament," it is hardly possible to lay down any general theory on such a subject. The too-much or too-little is so completely a matter of the circumstances and nature of the particular case that one would have to call for a fresh decision in each instance. Mr. Day comes, perhaps, as near as is possible to a general theory in saying that the work itself, its nature and what the material would lend itself to,—points out where to stop. This is true enough, but it requires a considerable insight to know when this limitation is reached. No words will teach it; they may possibly, however, suggest to the craftsman the direction in which to keep guard against over-elaboration of ornament. So long as the ornament itself is good, both in idea and in design, and nothing is introduced contrary to the nature of the material, or to the practical purpose of the object ornamented, we doubt whether ornament can be carried too far. In most cases where we have that impression, it will be found either that the ornament itself

\* "The Application of Ornament." By Lewis F. Day. Illustrated. London: B. T. Batsford. 1888.



is commonplace in design, or that it interferes with some practical requirement.

In the chapter on "Style and Handicraft" it seems to be pretty nearly assumed that these are practically the same thing; that it is the special conditions of each handicraft that insensibly produce or form their own style. Of course there is a great deal of truth in this, and it is well illustrated by examples of work in different materials, showing the influence of the material on the manner of work; but it will not do to confound "style" in its wider sense with the manner or character given by the influence of the tool and the material; there is something more than that implied in that subtle and untranslatable expression "style." The characteristics of work, as varied in accordance with material, are, however, admirably illustrated by illustrations of three works, an Egyptian granite statue, a Greek marble bas-relief, and a sandstone statue. The same thing is supposed to be shown in the examples of Arabic plaster-work, given on plate 21; but here the illustration rather fails; the style of work shown there, with its incised lines and flat cut-out forms, is by no means essentially and specially adapted to plaster: one may be apt to think so from seeing so much plaster ornament of this kind in Arabic work, and associating the style with that material, but in reality it would be just as applicable to some other very different substances. The author makes a really picturesque criticism when he says the "somewhat savage enrichment of our own Norman



Fig. 1.

of the tools—perhaps also the rudeness of the men who handled them.

The chapter on "the teaching of the tool"

the manner in which work of this kind almost inevitably proceeds, commencing by indenting the leading forms, and then connecting the indentations. "In beaten work you descend from the mass to the minutiae; in filagree, on the contrary, you ascend from the minutiae to the mass." The illustration appended (fig. 2) shows how nearly similar is the result of the same method of working, in things produced in different countries at an interval of five centuries or so. The characterlessness of seventeenth century work is due, Mr. Day thinks, in great measure to the absence of any direct impress of the tool on the design; "in the process of modern manufacture, everything is planed down to a marvellous and wondrous smoothness; the mark of the tool, which is the evidence of workmanlikeness, is popularly regarded even as bad work—want of finish, indeed." There are two sides to this, however. Some of those who protest against smoothed-out and over-finished work, rightly so far, seem rather in danger of going to the other extreme, and considering roughness of finish as a condition or indication of excellence; just as some painters delight in leaving prominent brush-marks on their canvas. That is not what we want pictures for, after all; nor do we want carving merely as an illustration of methods of tooling, which, after all, is the means, not the end.

A concluding chapter on "some superstitions" is a protest against the too ready acceptance of certain things as necessary articles of faith with the decorative designer;



Fig. 2.

buildings forcibly recalls the rude way in which it was done. It is, more properly speaking, chopped than carved," which is exactly the case. This seems to be the influence, not so much of the material as of the rudeness

carries the same idea further into detail. An illustration of foliate executed in rinceau work (fig. 1\*) forms a very good example of

\* Mr. Buttsford has kindly authorised us to reproduce two or three of the cuts, to aid in illustrating these remarks.

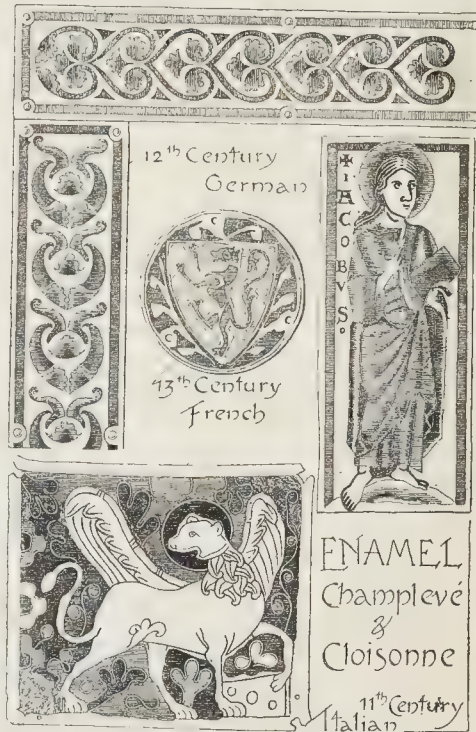


Fig. 3.

for instance, the necessity of strongly-marked outline. There are not many kinds of decorative design, however, in which a strongly-marked and firm outline is not desirable; but the author gives a good example as against



the universality of this faith in comparing champlévé work with cloisonné. In the latter, the soldered-on metal boundary gives a necessary outline, which is kept at a uniform thickness, not merely as a matter of taste, but as a matter of convenience of execution; whereas in the "digging out" process of champlévé there is no such reason for a regularly-treated outline, and it is often more convenient for the artist to forego the attempt to leave regularly-formed barriers between the enamel; and the characteristic distinction between champlévé and cloisonné should be, in fact, that the latter shows regularly-formed outlines, and the former does not. The emblem at the foot of the adjoining plate (fig. 3) shows both processes in one piece of work, the animal being champlévé, and the conventional foliage-ornament cloisonné; and in the pieces of border at the left hand and top of the plate the characteristics of champlévé are well shown; the enamel being obviously let into the metal ground, leaving the latter in irregular spaces between, and no regular outline confining the enamel pattern. The author points out also that in other forms of work, as in stained glass, thick outline may be a necessity of the construction; but "there is no law making outline compulsory"; and Mr. Day gives one illustration of appliqué work, with the design outlined by braiding sewn over the joining of the materials, in which the effect of the overpronounced outline is to our eyes very bad indeed, though we do not gather that the illustration is given as a warning.

The summary of the teaching of the book is perhaps in the last sentence: "What is called convention is not a hindrance to the workman, but a help. If he finds it an impediment, he would do well to ask himself if that may not be his fault."

#### REMARKS ON THE MILAN FAÇADE COMPETITION.\*

BY PROFESSOR MELANI.

**T**HE International Competition for the Façade of the Milan Cathedral may be considered one of the most interesting artistic events of the century, and one of the most powerful proofs of the historical tendency of architectural study. Inspired by the object of establishing a style for the Cathedral in its façade, the competition, both in its scheme and in its development, has not met with unanimous and strong approval; in fact, it has been quite the reverse. That which happened at Florence concerning the façade of the Cathedral was not the case at Milan. In the Milanese Cathedral the façade already exists, and various portions of it possess indisputable merit; in the Florentine Cathedral the façade was entirely wanting, and the rough wall contrasting with the gorgeousness of marble polychromy in the other portions of the building was a great and intolerable eyesore.

The present façade of the Cathedral of Milan is in two styles: the late Gothic style of Carlo Buzzi, an architect of the seventeenth century, and the fantastic style of Pellegrino Pellegrini (1532?-1596).

Having mentioned the name of Carlo Buzzi, you will allow me to direct your attention to the fact that this architect has had a large amount of influence on the present façade of the Cathedral, and on the one which is to be made in future, though this influence has been diminished by recent studies made of the work of Francesco Maria Richino (1533-1658), who was the author of a project for the façade of the Cathedral which was unknown until very recently.

The façade of our Cathedral has, however, been the subject of innumerable projects made in the last two centuries, as a drawing of the façade contemporary with the foundation of the church has never existed; in fact, the first who occupied himself seriously about

this matter was the Archbishop Carlo Borromeo, and this was not before 1571. Pellegrino Pellegrini appears on the scene at the same time as Carlo Borromeo, he having been invited to make two drawings for the façade, which he did, following in both cases the so-called "Baroque" style of his times. The two projects, which were forgotten for about twenty years, were not taken seriously into consideration until after the death of their author, and then not by him who had commissioned them.

The selection took place in 1609, by direction of the successor and cousin of Carlo Borromeo, the Cardinal Federigo Borromeo, and it was a selection subservient to the condition that important modifications should be made in the selected project. The works were commenced immediately; but, for various reasons, the principal of which was the difficulty in obtaining certain columns about twenty metres in height, it was only partly carried out.

The fact is, however, that the present façade of the Cathedral bears visible and praiseworthy impressions of Pellegrini's work, and that the studies for the façade of the Milanese Cathedral enter into an entirely new phase of study totally contrary to the previous one. After the Pellegrini project, Carlo Buzzi, following and enlarging on the ideas of Richino, was the architect who, when put to the practical test of constructing, disdained all the projects made on "Baroque" lines, and devoted his attention to Gothic architecture for the façade, as it had already been proposed by Francesco di Giorgio Martini, a man of considerable genius.\* This was in 1600, when the redundant and pompous style of art called, with great injustice, "Baroque" was in its prime. This eminent architect proposed three alternative designs, made between 1645 and 1653; the present façade may be said to be, in the main, his design of 1653, but miserably spoiled and debased by the modifications of the architects of the beginning of this century.

If there are two styles which are diametrically opposed both in plan and decorative system, they are the Gothic and the Rococo, but Buzzi had accomplished the difficult task of harmonising the Gothic design of the sides of the Cathedral with the Renaissance doors and windows.

But, as I have said, in the two projects, that of Pellegrini and that of Buzzi, the architects who from time to time undertook the direction of the works endeavoured each of them to fix on it their own individual imprint, and, therefore, while giving also to Francesco Maria Richino the place which he deserves in the arrangement of the present façade, I will sum up as follows:—The four minor doors and the windows above them are Pellegrini's work; the main door is in the upper part the work of Richino, as also the buttresses (he agreeing in this point with Buzzi); and the upper portion is Buzzi's. This is the present façade of the Cathedral of Milan, which, in spite of being in two styles and notwithstanding the mixture of various modes of construction, is in my opinion entitled to no little consideration. It represents a historical period; and portions of it, the doors for instance, are extremely beautiful; to destroy it might be considered an offence to the majesty of history, and this is why, before discussing the future façade, I have desired to point to the present façade, and to show under what circumstances it was erected.

But as in this world we cannot all have the same opinion, thus the feeling which I have here expressed, and which is supported by few, has met with opposition from those who desire uniformity of style in architectural monuments, and they have up to now triumphed. In September, 1884, a citizen of Milan, Aristide de Togni, died, leaving to the administration of the Cathedral the whole of his fortune, about one million Italian lire, for the specific purpose of reconstructing the façade; and with the proviso that the bequest should be devoted to its purpose within a specified time, viz., twenty years.

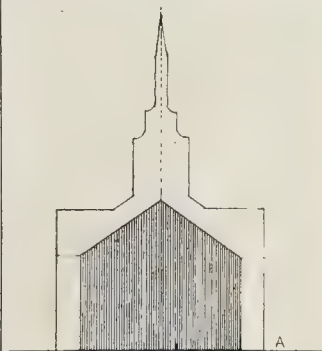
\* V. Springer, "Bilder aus der Neuen Kunstgeschichte," 1897, P. 152.

In the presence of this sacred obligation the administration of the Cathedral, which also cherished the idea of a new façade, found itself in the auspicious position of being able to establish a competition; and considering that foreign artists besides Italian ones took a large part in the works of our monument, it decided that the competition should be an international one. Besides this general clause, the administration of the Cathedral fixed another highly-important one, that is to say, that no estimated limit should be fixed for the expense. The administration of the Cathedral was induced to take this step, which was approved of by all, with the aim of removing all possible obstacles to the freedom of invention of the competitors, and, moreover, in doing this the constant rule in the history of the building was followed; in fact, since the great structure was begun, and this is exactly five centuries ago, there is no sign of any economical considerations having ever been entertained.

The programme of the competition having been drawn up, it was decided, as you already know, to establish two different degrees of test, leaving the greatest liberty to the competitors' imaginations, on one sole condition: to use the same marble as used in the construction of the Cathedral, and to comply with the plan and "special style" of the monument.

The international character of the competition having thus been decided upon, it was a logical consequence that there should be an international jury, and this was the case. The foreign representatives in the jury were the following:—A German architect (Federico Schmidt), a French architect (Fernand de Darstein),—he having been preferred in consideration of a work of his upon *Lombard Architecture*, greatly different in an artistic sense from that of your compatriot Gruner ("The Terra-cotta Architecture of North Italy"),—and an English architect (Alfred Waterhouse).

It was also decided that after, a public exhibition, the international jury should choose at least ten, and not more than fifteen, of the competitors for the second test, to be carried out according to a definitive programme. The first competition took place; its success in regard to numbers being astounding. The public at Milan was persuaded that the highly-important problem would call the attention of a great number of Italian and foreign artists, but nobody could have expected more than one hundred and twenty competitors, and nearly four hundred designs; and not only the great number, but the merits of a great part of the works, raised the present competition to the position of one of the most noble and keenly-contested struggles which have ever been opened to architectural art among civilised nations.



The competitors rose from every side,—German, English, French, and Russian,—and it was wonderful to note the astounding variety of conception which struggled against the difficulties presented by the present façade of the Cathedral; difficulties which have perplexed the boldest and most powerful minds. But amongst the different conceptions it was

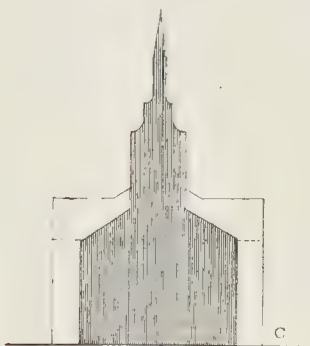
\* Translated from our correspondent's Italian. It will, perhaps, be of interest to English readers to have a criticism on the competition from the point of view of a Milanese architect.



possible to classify two main ideas, and to divide the designs into those developed according to the actual plan of the church (fig. A), and those having a compound basis,—that is to say, developed upon the turret lines of the transalpine cathedrals of France; for example, Rheims, Amiens, Notre Dame of Paris, Orleans, Bayeux, Rouen, Poitiers (fig. B). Another idea was developed, but in



a very timid fashion,—an idea that I might call a conciliatory one,—with the tower in the middle of the façade (fig. C). It is



scarcely necessary to add that the projects having for basis towers were mainly sent by foreign artists. Each of these types was represented in an effective manner at the competition.

The English competitors, as far as it is known,\* were two,—Mr. Brade, of Kendal, and Messrs. Pugin, of London (whose drawing unfortunately reached Milan too late to be legally accepted). Both proposed a façade with towers; both projects being very praiseworthy, but greatly open to criticism as to the interpretation of the style. And if I am allowed to express my opinion concerning the vital question of towers or no towers, I should frankly say that I strongly support the idea of a simple façade—that is to say, without towers. In our cathedral the towers at the two extreme ends of the façade are contrasting elements, which, as far as concerns the ground plan, inevitably spoil the simple and severe unity of the internal disposition, the principal merit of our Cathedral.

From the point of view of construction our temple is of a different nature from all transalpine Cathedrals. The dominant point in the Cathedral of Milan is the central spire, which is one of the main features of our traditional style. It was imagined and started at the very beginning of the construction, and by its size attracts the eye and impresses the mind. It is not the slender flèche of French Cathedrals, which naturally admits of the erection of towers in the façade,

and its artistic and ideal effectiveness would be destroyed if two steeples in the façade should imposingly spring up to more or less its height. The steeples in the façade would, moreover, have a bad effect, as the three spires would, so to speak, neutralise one another, leaving the eye uncertain which point to regard as the climax of the design. (See fig. B). In one word, in the centre spire is the key of the plan of our building. By removing its supremacy its decorative and structural functions are ignored, and this consideration is, in my opinion, vital.

The International Jury considered it advisable to state in its report that it could have chosen many more than fifteen projects in this first competition had it been permissible to increase in the second and decisive contest the small number of the elect. The selection was made as follows:—Among the fifteen eight were Italian, six of them being Milanese; two were German, two Austrian, one French, one English, and one Russian; nor is it to be wondered at that among the eight Italians six were Milanese, as the local competitors were extremely numerous, while the competitors from other parts of Italy replied in but a feeble manner, both concerning number and importance of projects, to the invitation of the administration of the Cathedral.

Were I asked how the proposals of the jury were received by the artists and by the intelligent portion of the public, I might occupy a very disproportionate amount of your space in replying; therefore, on this point, I will limit myself to stating that the first selection made by the jury did not bring any light to bear on the studies for the façade of the Cathedral. This selection being based on a very comprehensive system, offered us façades with or without steeples, with parallel slopes, or with converging slopes with horizontal ends, or five gables with a large window over the main door, or with a round window with three doors instead of five, &c. The jury seem, in fact, to have considered it advisable to select examples of each method of treatment proposed; on the merits of which decision it is not worth while to say anything now.

I will, therefore, proceed to the final competition. At the time fixed, September 15, the competitors presented their respective drawings. Ciaghin, of St. Petersburg, being dead, the competitors were only fourteen instead of fifteen. Therefore, there were fourteen projects—or rather sixteen projects—as two of the competitors, Signor Cesa-Bianchi, of Milan, and MM. Hartel and Neckelmann, of Leipzig, submitted a double solution of the problem, that is to say, the façade with terminal towers, and the simple façade without towers.

Mr. Brade, who had on the first occasion also submitted a project which in itself was highly praiseworthy, but which, considered in relation to the style and plan of the Cathedral, was totally out of harmony, being still persevering in the solution he had proposed, persisted in maintaining it in its former condition, to his detriment, as the jury was obliged, for the sake of justice, to exclude his project from any discussion, as it did not comply with the requirements of the programme; that is to say, it was not in harmony with the plan and style of Milan Cathedral. And I regret this, as Mr. Brade, whom I do not know either personally or by his works, has given proof in his project that he is a talented architect. But the fact is that the monument in question, having to be erected according to an original style, and it being a question of completing an ancient work, an international competition, though a noble and generous scheme in theory, is, in practice, in such a case, absurd. The style of a building is not the mechanical work of artificers, but the result of the co-ordination of many influences, arising from feeling, climate, and education, which vary according to the race of the people and according to the geographical position of a country.

Roman art, which was Roman because it could not be Greek, and notwithstanding the strong and constant influence of Greece on Rome, has characteristics of its own which arise from

the temperament of its people and its climatic conditions. For the same reason, the Gothic of an English abbey or cathedral is not, and cannot be, the Gothic of the Cathedral of Milan, of Santa Croce, or of Santa Maria del Fiore.

In this competition, therefore, the native architects conquered the foreign ones through their faithfulness to the original style of the cathedral; and this is an essential condition, as the monument in question exists already in the greater part, and is to be completed according to its own style. Among the foreigners, the project of M. Depertthes, of Paris, with very high towers, attracted the most attention, by its ambitious and imaginative character. But it was precisely this that prevented its success. It was too imaginative, and had too little reference to the actual conditions of the problem; and it had also the defect of being too obviously the design of a French artist born and educated under a French sky.

The turriiform pattern is, in my mind, not suitable to the plan and style of our Cathedral, but it found an intelligent advocate in Sig. Cesa-Bianchi, of Milan, of whose project I send you a drawing, together with that without towers by Sig. Brentano, which was the one chosen for execution. The Bianchi project is evidently the result of very careful consideration. The fact that its author endeavoured to Italianise a foreign element, in accordance with the requirements of the plan of the building, is a merit which must be taken into account in regard to it. The towers, perhaps, are deficient in height, considered in themselves, but it is evident that the author did not carry them to a great height for fear of injuring the predominance of the central feature. And the idea, in this plan, to isolate the three doors from the upper portion of the façade, joining them in the plan with the line of the towers, is good and picturesque.

Among the foreign designs, and especially those without towers, is to be specially noticed the project of Sig. Nordio, of Trieste, a design which has closely competed for success with that of Sig. Brentano.

The idea which has won the day, then, has been the simple one, the idea which followed the existing plan, and which was formulated on the basis of not altering in the slightest degree the structure, and leaving the central spire or lantern as the predominating feature.

The design of Signor Giuseppe Brentano, a very young Milanese architect, from the very first days of the Exhibition drew the attention of the connoisseurs as the one which, by its picturesque treatment and individuality, attracted the greatest attention. The piers are made to correspond with the internal piers: the lower portion is divided by long windows similar to those which exist at the sides of the cathedral, and in the central nave is a large window similar to those in the apses, which are among the most striking features of our monument.

How is it there are three doors instead of five, since there are five aisles? This is a question certainly open to discussion. The documents which refer to the first years of the construction of the cathedral do not contain any allusion to the number of doors in the principal façade. There is, however, in the deliberations concerning the beginning of the construction, an allusion to the idea of transforming the minor aisles into a series of chapels, as in San Petronio at Bologna, a church which was begun a few years after our cathedral, with the intention of emulating, or, rather, surpassing, the majesty of the Milanese church. But at Milan the old idea was in no way followed up. Therefore, as the plan of the cathedral, without chapels in the further aisles as it is now, is perfectly consistent, the idea of the three doors, followed also by another talented competitor, Signor Beltrami, has no logical reason in its favour.

You must not, however, suppose that the Brentano façade is to be carried out exactly as its author proposed; it will have to be modified in some parts, by the special desire of the jury, which, however, was nearly unanimous in selecting it from the sixteen

\* The greater part of the plans were distinguished by a motto, with the exception of a few which were signed, perfect freedom being allowed on this point.



projects submitted. Signor Brentano will, for instance, have to forego his idea of having sliding doors to his façade, and this because the idea is thoroughly modern, and because in a temple like ours bronze doors will have to be placed, for which, in fact, the Melleiro bequest of 100,000 lire is in store. In the meantime, before the demolishing hammer commences to attack the present façade, Signor Brentano will have to have a model of his design constructed under his supervision, and at the expense of the administration of the cathedral, on a scale of one-twentieth the size of the executed design, according to the model of the cathedral possessed by the administration. After the construction of the model, he will be entitled to the second half of the reward of 40,000 lire, which was fixed for the winner of the present competition. In speaking of Signor Brentano personally, I should say that he is at the very outset of his career, is twenty-six years old, and only two years have elapsed since he completed his studies, and that this is the first competition in which he has taken part. Undoubtedly, he begins his artistic career where many would be more than glad to end their own.

I must add that not everybody here believes that the new façade will be really constructed, and I know not what to tell you in this matter. It is certain that attacking the present façade with the idea of demolishing it from top to bottom is an irreverent and dangerous undertaking. But if so, why was the present competition for the new façade of the Cathedral of Milan promulgated? For myself, I find it convenient to close this lucubration of mine with the very opportune motto which distinguished the project of your compatriot, Mr. Brade,—"Chi vivrà vedrà."

ALFREDO MELANI.

Milan, November, 1888.

#### NOTES.

**T**HE financial crisis of the Panama Canal scheme must have been foreseen for some time past by all who had eyes to see. The refusal of the French Government to pass the proposed measure for permitting the company to ignore their responsibilities to their creditors for a specified time,—giving them, in fact, a legal permission to stop payment without the usual consequences of stopping payment,—may probably be attributed to political rather than moral motives. The French people would probably condone any eccentricity of special legislation in support of a scheme to the completion of which the honour of the country seems now pledged. But there is no doubt that any definite interference by the French Government in favour of the scheme would cause the American Government to regard it in a very different light from that in which they view it as long as it is in the nature of a private enterprise. That this is so has been significantly shown by a resolution proposed to be brought before the American Senate by Senator Edmunds, as reported in the *Times* of Thursday. That the canal can be completed if the French are disposed to go on spending money *ad libitum* upon it we have little doubt; the confidence of the contractor for the locks, M. Eiffel, who is, presumably at all events, a practical man, speaks strongly in this direction. How far this pouring out of money will have to go, however, is what no one can well prophesy; nor can it be ascertained, except by experience, how far the French people will continue to be enticed by M. de Lesseps's sanguine and contagious enthusiasm, and how far they will forgive M. de Lesseps for the light-hearted manner in which he has lured them along with golden promises, the solid grounds for which he seems never even to have explored himself. According to that wonderful person, the Paris correspondent of the *Times*, however, it seems that this neglect to ascertain the actual facts is to be regarded as M. de Lesseps's best excuse. In the Paris letter of the *Times* of

Monday we read, "It is but fair to M. de Lesseps to state that when he launched the scheme he had never seen the isthmus!" So that, according to this sapient gentleman, it is to be maintained to the credit of M. de Lesseps that when he launched a vast engineering scheme, which was to engulf millions of money entrusted to his company by private shareholders, he had never examined the site on which the work was to be done! It will be difficult for even M. de Blowitz to beat that.

**I**T may be remembered that, by an order of the Chief of Police of Berlin, issued on April 4, 1884, the use of cast-iron columns not protected against the action of fire under supporting walls of buildings in Berlin was forbidden, only wrought-iron columns, or piers constructed of Dutch brick, being permitted. The Association of German Ironfounders have taken steps to have the order cancelled, as injurious to the interests of the trade, and, with that view, have collected evidence to demonstrate that the order was unnecessary. At the recent general meeting of the Association, Herr Jungst, of Gleiwitz, reported on the progress made. He pointed out that, according to experiments made by Professor Bauschinger, both cast and wrought-iron supports lose in solidity, and are bent, when exposed to the action of fire, but that cast-iron columns are able to support the weights superimposed on them in a fire, whilst wrought-iron columns do not always possess that property. After hearing the report, the meeting unanimously resolved to ask the Chief of Police to annul the order, but to leave it to him to issue special instructions as to the conditions under which such supports should be employed, care being taken, however, that cast-iron columns are sound in the core, and not cast eccentrically. It is to be hoped that the official authority will not listen to an appeal, obviously prompted by trade interests, against a regulation which is a most desirable one for the safety of public buildings.

**T**HE immense advantages which, in addition to the saving in cost, result from the application of gaseous fuel to metallurgical operations are well known. Mr. B. H. Thwaite, C.E., who has been much identified with this branch of industry, has recently described in detail a bold scheme by which he conceives it possible to supply the towns of England with gas brought in pipes from the coal-fields of South Wales, Staffordshire, and South Yorkshire. The coal would be converted into gas at those localities, delivered into mains at great pressure, and thence conveyed to London, distribution being made to the large towns on the way. The gas would be available for heating purposes by day, and for illumination, by means of special burners, at night. Mr. Thwaite points out the great saving in fuel that would result,—the fact that there would be no expense for railway transit, or haulage, no middlemen, and no smoke. That the scheme is not impracticable is proved by the fact that natural gas is conveyed to a distance of 60 miles from the wells in Pennsylvania to distributing locations, and that within the last few years the mileage of the distributing pipes has increased to 2,300 miles. Mr. Thwaite even thinks that natural gas might be found some 1,500 ft. below the salt-beds of Cheshire, and probably underneath the coal-fields also, if we were enterprising enough to make the necessary borings.

**D**R. BRUCE LOW has made a report to the Local Government Board on an outbreak of diphtheria in the Ashbourne Urban Sanitary District. The town is divided by the river Memore into two parts, Ashbourne and Compton. In the neighbourhood of the market-place on the Ashbourne side—

"Dwellings are crowded together in back-yards or courts, entered by narrow passages. Compton, on the other hand, is low-lying on gravel and alluvium, and in rainy seasons is liable to be flooded by the stream. It is connected with Ashbourne by a bridge, and its main street runs almost due south. A large

proportion of the population here inhabit crowded back-yards or courts behind the main street. The dwellings in these courts are commonly old, damp, and in many cases overcrowded. As a rule, they have only doors and windows on one side, and, as in the houses behind the market-place, there is an absence of free movement of fresh air in and around them. The yards are mostly unpaved and irregular, so that the surface is often fouled by stagnant sewage."

The water supply is entirely from wells; and this is the condition of things, a condition occurring over and over again in these disease reports:—

"Most private houses have wells of their own. These houses which have none get their supply from one or other of the three public pumps, or beg from their more fortunate neighbours. The shallow private wells, and especially those in Compton, are very liable to pollution. In one instance observed, the urinal attached to a public-house was within two yards of the pump; the urine could be seen on the surface, soaking through the unpaved and unprotected yard above the shallow well. In other cases, pig-sty, dung-heaps, and other collections of animal matter were seen in close proximity to the wells. The nature of the subsoil is favourable to soakage."

We come again also on the old plague of waterclosets with no proper mechanical flushing apparatus, with its usual consequences:—

"Many of the poorer houses have in the back yards waterclosets, which have to be hand-flushed. In several cases these were found in a filthy state, crammed with excrement, and completely stopped. The scarcity of water, and the necessity of carrying it from the well or public pump to the closet, are not favourable towards keeping such closets clean."

The Medical Officer of Health receives 10*l.* per annum. His recommendations are not acted upon by the local authorities, and, adds Dr. Low, "the sum allotted to him as Medical Officer of Health may fairly be regarded as measuring the amount of service expected from him."

**M**R. J. H. SARGENT has communicated to the American Journal of the Association of Engineering Societies his experience of wood and brick pavement in the United States. Speaking generally, his opinion of wood as a material for paving does not appear to be very high. In some cases, where poor lumber made from dead timber was used, the blocks rotted and disappeared in a very short time. A pavement was, however, made from cedar poles cut into 8-in. blocks, and bedded in gravel. This has been found to last for several years without wanting repair, whilst white cedar will not rot for ten or twelve years. Mr. Sargent has found hard-burnt clay bricks very successful. Those bricks are burnt hard enough to vitrify the moulding sand on their surfaces, and they are thus proof against the attacks of air or water, being homogeneous, slightly elastic, and more resistant than granite. It is generally thought that bricks made from fire-clays are more suitable for paving than the common red clays, but in some parts of the United States bricks made from common clay have been in use for twelve years; some taken up after ten years had been worn less than  $\frac{1}{4}$  in. Porous bricks are specially made in the United States for paving purposes. They are impregnated with creosote or bitumen, and, according to the *Chicago Journal of Commerce*, have been largely used in Nashville, with very good results. The bituminising a little more than doubles the original cost of the bricks. One important point mentioned is that the wear is uniform, and this is accounted for by the fact that the more porous bricks absorb more bitumen, and so become harder, whilst they are impervious to wet, and, naturally, free from the disintegrating action of frost. An instance is given of a pavement of this description which was exposed to a heavy traffic for three years and a half, at the end of which time it was in excellent condition.

**O**UR contemporary *Engineering* gives in a recent issue some interesting particulars of steel beams used in the foundations of some of the buildings of Chicago. This city is built on a spongy alluvial soil, and some of the principal buildings are disfigured by unsightly cracks, due to settlement. Some of the later buildings have been sustained in



the most successful way by a system of independent foundations, wherein the various supports to the building rest upon foundations of an area calculated to sustain the load which will be imposed in a manner which will give a uniform intensity of load per unit of area upon the earth beneath. A different plan is followed in other buildings, in the endeavour to make the whole foundation as rigid as possible. Instead of accepting the condition of settlement and endeavouring to control results by arranging that such settlement shall be uniform, large beds of concrete have been laid to a depth of 2 ft., and upon these steel I beams are placed. These extend from 6 ft. to 7 ft. beyond the line of the building, and they are enveloped in concrete in order to prevent oxidation. Above the I beams there is laid a platform consisting of plates of cast-iron, upon which the structure is reared. In some cases, steel railroad-rails have been used.

A NOTE in the *Classical Review* for December, by Mr. A. S. Murray, on "A Vase Painting after Zeuxis," is sure to attract a good deal of attention. We are accustomed to think of the paintings of Zeuxis and his contemporaries as,—even in the matter of general outline and composition,—irrevocably lost. Here we have, in a large krater recently acquired by the British Museum, a design which is beyond a doubt, not indeed a reproduction, but "an artistic souvenir,—and the only one we possess,—of a picture which was famous for several centuries in antiquity." The scene shows the infant Herakles strangling the snakes in presence of Alcmene, Zeus, and other divinities. Pliny describes a picture by Zeuxis thus: "Magnificus est et Jupiter in throno adstantibus diis et Hercules infans dracones strangulans Alcmene maie coram pavente et Amphitryone." We advise our readers to take the number of the *Classical Review* with them, and carefully inspect the vase itself; they will see that, making due allowance for the exigencies of the vase-painter's craft, they have a very close copy before them. We must again repeat that the *Review* never serves the general public better than when it thus enables the ordinary educated person to understand and appreciate additions made to our national treasure-house, and paid for by our national money. At the same time a visit of inspection should be paid to the small case of objects presented to the museum by the Cyprus Excavation Fund. They are conveniently placed together, and will shortly be discussed in the *Journal of Hellenic Studies*. The most interesting object is a gold pin, with the head in the form of a Corinthian column, with four bull's heads projecting from the acanthus leaves, like the Persepolitan capitals and those of the "bull temple" at Delos. Above, on the abacus, are four seated doves, drinking out of cups. An inscription runs down the pin, recording the dedication by a lady to "Aphrodite of Paphos," in letters of about the end of the third century B.C. In the same case the most prominent object is the head of a boy, possibly Eros. It is of the unsatisfactory sort of work which the Greeks seem generally to have thought good enough for miniature subjects, and reminds us of the head of the infant Ploutus in the Central Museum at Athens.

WHEN the publications of the German Archaeological Institute were re-organised, it was part of the programme that from time to time supplementary volumes should be issued which should be in effect separate treatises on subjects not admitting of full discussion within the limits of an ordinary issue. The first of these ("Ergänzungsheft I.") has just appeared. It is from the hand of Dr. Josef Stürzgenowski, and deals with the "Calendar Pictures of the Chronograph of the Year A.D. 354." These pictures are preserved in copies of varying dates in the Vatican and Barberine Libraries and in the Royal Library at Vienna. They are now for the first time reproduced by photography, and placed in regular sequence. As their editor

rightly observes, they have, besides a high antiquarian interest, this special claim on attention, that they throw light on the gradual transition from Pagan to Christian art. The plates are thirty-five in number. Those representing personified forms are specially valuable. No one will deny that the first "Supplement Band" maintains well the reputation of the Institute, but subscribers to the "Jahrbuch" should bear in mind that they may expect from time to time to receive this trifling addition to their library at a cost of thirty marks.

THE fine ancient carved oak choir-stalls from the Monastery of Buxheim, in Bavaria, which we mentioned (*Builder*, May 12 of this year) when they were offered for sale by a London dealer, have been purchased for the Chapel of St. Saviour's Hospital, Osnauburg-street, Regent's-park, and are now set up there.

THE *Australasian Builder and Contractors'* News of October 27 gives illustrations of the three premiated designs for the Thomas Walker Hospital, to be erected on an extensive site near the Paramatta River. We give some particulars, extracted from the same journal, in another column. The accepted design, by Mr. Kirkpatrick, shewn in a bird's-eye view, appears to be planned in accordance with the most approved sanitary principles, as well as with a considerable eye to picturesque effect. The hospital consists of various one-story pavilions of a rather "cottage-hospital" appearance, connected by long covered corridors with each other, and with the administration block, which occupies, of course, a central position on the site.

IN an account which we printed last year\* of Canons we spoke of a project by the "Grand" Duke of Buckingham and Chandos to build himself a town mansion, as designed by John Price, architect, 1720, along the northern side of Cavendish-square. The middle portion of the site, however, was used for the two existing well-known stone-fronted houses, each having a rusticated basement supporting a classic order. These sister houses were designed, it is said, by James, a joint-architect, with Gibbs and Shepherd of Canons. As subdivided they are now numbered 11-14. The doorways are still marked by their lamp-irons. The freehold of No. 11, towards the east, will be offered for sale by auction, about three months hence, with possession. The opening between the two houses leads by an incline, turning to the left hand, down to the stables. The whole site, including the garden, with other vacant ground at the rear, extends over an area of 13,000 ft. superficial. This square was originally planned in 1717-8, but various causes delayed the completion of the scheme. It formed part of the dower which the Lady Henrietta Cavendish Holles brought (1713) to her husband Edward (Harley), second Earl of Oxford and Mortimer.

PRESSURE of other matters has prevented our giving adequate mention before to the remarkable winter exhibition of the Society of Painters in Water-colours, which is a real triumph for English Water-colour Art. We do not know when we have seen an exhibition with so large a proportion of really fine and interesting work, to which it would be impossible to do justice in the space we can afford to matters not architectural. A special feature in this year's exhibition is the collection of studies for figures by Sir F. Leighton, Mr. Burne Jones, and Mr. Poynter, which are hung at the top of the room, and some of which are of great interest and beauty. Mr. Burne Jones reappears also, as a Member, with a very large water-colour (so-called, it seems to be all in opaque colour), "Caritas" (30), a richly-draped ideal figure in a style similar to a good many others of the kind which he has done; the interest is rather that of decorative effect than of human expression. Among other figure-subjects, Mr. Arthur Hopkins is exceedingly

interesting with his group of foreground figures in "The Golden Hour" (43), a scene of which Whitty promontory and town form the background; the old woman on the right is an admirably characteristic study. So is Mr. Marks's old gentleman musing over "The Sundial" (35). Mr. Glindon's "Revolutionists" (139) is a clever if disagreeable study of some disagreeable persons of the French Revolution epoch. Mr. Walter Duncan contributes a fine bold study of a rather over-blooming young woman under the title "English Roses" (313), the work of an artist who is not afraid of bright colour, and knows how to deal with it. Mrs. Allingham's "Rhoda" (382) is a beautiful female study of another type. The strength of the exhibition is, however, in its landscape, as is usually the case. The number of fine things is not less remarkable than the diversity in the style and manner of treating landscape, which would form an instructive study in itself, if we could go into it here. The finest works are really those in the broad style of water-colour, such as Mr. Eyre Walker's "Autumn in the Woodlands" (146) and "A Wet Day on Emory Down" (109), the latter a grand painting on a small scale. But it is impossible to refuse admiration for such an exquisitely finished bit of topographical art (if one may so call it) as Mr. Gregory's "On the Vire, St. Lé" (49), a scene so picturesque in itself as to require nothing but accurate setting forth to make a picture. Mr. A. Hunt has never done anything more poetical than his "Wind of the Eastern Sea" (359), and "On the Way to the Maelstrom" (196); in the latter, the colour of the water is strange and ominous in a remarkable degree. Sunlight,—actual sunlight,—glitters in Mr. Powell's "Autumn: Tor-aluinn Woods" (154), and on the hill in Mr. Marshall's large drawing, "Landing Nets, St. Ives Pier" (176), in which, perhaps, the foreground wants force rather. Several small landscape studies by Mr. Walter Crane are of interest, both for their powerful style and for the fact that they are his; we may mention especially "A Study from the Sand, Harlech" (65). Among other works may be mentioned Mr. R. W. Allan's "In Holland" (12); Mr. Thorne Waite's "Dividing the Flock" (22); Miss Maud Naftel's "The Fields breathe sweet" (50), an exquisite little summer landscape, and Mr. Robertson's "An English Meadow" (51)—a work of rather the same stamp; Mr. Hardwick's study of "Raspberries and Strawberries" (73), almost equal to the late Mrs. Angell, but not quite; Mr. Pilbury's little country-house scene, called "Evening" (96); Mr. Thorne Waite's "Lunch-time" (120), an idyll equally charming in figures and landscape; Mr. Gregory's "Bay of St. Michael" (140), a large sketch from a high point of view, with an immense amount of detail indicated; Mr. G. A. Frispp's "Dunstaffnage Castle" (160); Mr. Albert Goodwin's "Durham" (187); Mr. Henry Wallis's "In the Porch of the Mosque of Sultan Hassan, Cairo" (199), a brilliant piece of painting of architectural detail; Mr. Robertson's "The Harem Door" (209), an odd but unquestionably powerful work; Mr. T. J. Watson's "Queen's Bower, New Forest" (254); Mr. R. W. Allan's "Dordrecht Cathedral" (265); Mr. Andrews's "Study from my Bedroom-window, Rotterdam" (327), a clever architectural subject; Mrs. Allingham's exquisite "Spring Days" (333), and "On the Sunny Shore" (337), the latter with a charming little girl figure; and Mr. Marshall's "Amsterdam" (381). In referring to Mr. Walter Crane's contributions, we should have mentioned that he sends also some studies from the remains of Athenian architecture—a "Sketch of the Propylæa" (59), "Sketch of the Acropolis" (243), and "Sketch in the Ruins of the Parthenon" (371).

**A Russian School of Painting in Rome.** The Russian Government has decided upon establishing a State-supported school of painting in Rome, at which rising young Russian artists may study at a minimum cost under the best teachers.

\* See the *Builder* of June 25, 1887.



## THE DOOM OF NEWGATE.

A CHRONOLOGICAL SKETCH.

His [Dance's] *chef d'œuvre*, however, was the design for the prison at Newgate, which, though only a prison, and pretending to be nothing else, is still one of the best public buildings of the metropolis. . . . There is nothing in it but two great windowless blocks, each 90 ft. square, and between them a very commonplace gaoler's residence, five windows wide and five stories high, and two simple entrances. With these slight materials he has made up a façade 297 ft. in extent, and satisfied every requisite of good architecture.

JAMES FERGUSON, "History of Architecture,"

ii, 298. (Edit. 1862.)

TWENTY-FIVE years ago an exceptionally extensive clearance was made in the ward of Farringdon Without for the construction of Holborn Viaduct. A fine and rare prospect over the Fleet-valley then lay before anyone who stood over the uncovered site of the old bridge, at a short distance from the City's later wall. At that spot, on the ancient Watling-street, his range of view extended eastwards to Smith-field and Clerkenwell, Ludgate and Blackfriars, on either hand the steeples of St. James's and St. Bride's rising loftily from their midst. In the foreground appears the pinnacled tower of St. Sepulchre-in-the-Bailey; beyond this the steeple of Christ Church, Newgate-street, stands out from above the still vacant site of Giltspur-street Compter; in the farther distance emerges the beautiful stone spire, Wren's handiwork also, of St. Vedast, Foster-lane. Even more striking, perhaps, than any of these was the aspect, as seen from the hollow of Holborn-hill, of the massive majestic pile whose walls, their own doom at length decreed, will echo to Robert Dowe's execution bell at St. Sepulchre's no more. For more than a hundred years Newgate Prison, as we know it, has stayed in solemn state just without the wall upon the brow of that acclivity which, with a rapid river coursing turbulent below, had in ages remote afforded defence for the capital. Why, then, a "new gate" in so pristine a quarter?

Stow's circumstantial account of the origin of this name, being to the effect that it was the fifth and latest gate in the City wall, is commonly rehearsed with approval, though we are inclined to think without due inquiry. We have never felt able to accept his explanation as altogether satisfactory, any more than those he gives us in respect of certain other of the City Gates. It is likely enough that the additions made by Bishop Richard to St. Paul's in the interval 1108-27, did oblige the citizens to take for their traffic westwards some route different from their former way through Lud Gate. Yet the fact that another road is chosen does not in itself demonstrate the fresh track to be a new one. And a new one it was not, by any means. Controversial questions apart, it will suffice here to observe that at the modern Newgate, or at least very near to it, just northwards, the old highway, possibly a British road from the North-West, entered London, traversing the later rampart that had here been thrown across its path, *circa* 865 A.D. Continuing south-eastwards, past the Querne, it pursued its course towards the crossing over the Thames, on a route which is still commemorated, if not actually marked, by the street to which it gave a name beyond St. Paul's. And this, be it noted, before the metropolitan cathedral was built. These and other points considered, it would be scarcely unreasonable to contend that the successor of the earlier West Gate, afterwards known as Chamberlain Gate, represented one of the oldest rather than latest of the City gates.

Chamberlain, or the Chamberlain's, Gate was standing, *temp.* William I., across the street between the now prison and Warwick-lane. It may have borrowed its style from William le Chamberlain, who was seised from the King of land in the neighbourhood. That holding, of 13 acres, known as "No Man's Land," and cited in Domesday, is by some considered to have been the site of the Charterhouse, whilst others would identify it with a vineyard by Holborn. This gate was rebuilt in the reign of Henry II. or that of Richard I. Like others of the City gates, it was soon used as a prison. It certainly so served *temp.* Henry III., for in 1218 that sovereign writes to the sheriffs, Joyce le Pesur (bell-founder) and John Vye, already charged with its custody, a command to repair the gaol, and says their expenses shall be allowed to them upon their account with the Exchequer.

From about this time, too, it became the scene of those annals of misery, dissipation, and disease whose story has been told too often to need repetition here. Whether in some hope thereby to assuage such evils cannot be said;

but it is known that in 1400 Henry IV. gave a charter to the Corporation for the control and ward of the gaol. What was even then described as its ruinous and horribly loathsome condition excited the reforming spirit of Sir Richard Whittington. In terms of his will a licence was granted, in 1st Henry VI., to John Coventre, Jenken Carpenter, and William Grove, executors of Whittington's estate, "to re-edify the gaol of Newgate, which they did with his goods." And thus our tale comes down to the veritable Newgate, in both form and name. The new building was of the familiar type, oblong on plan, with archway and northern foot postern, four flanking octagonal towers, and battlements. Later enlargements, — to be noticed hereafter, — mainly along the southern side, changed the ground-plan to something like a letter H; whilst the added portion, facing down Old Bailey, had an entrance and gaoler's lodge, with the cruel motto, *Veni sic fur*, above. The gate's two fronts carried ranges of pilasters with entablatures, in the Tuscan order, in the niches whereof stood seven symbolical statues — one of them, in honour of Whittington, representing Liberty with a cat at her feet. The survivors of these figures, as left after the Gordon Riots, stand, four in number, in the southern wing of the present fabric. In response to the gaoler's petition, the eastern part of the gate was subsequently repaired. That work, together with the restoration after the Great Fire, was recorded by an inscription which we find in Hatton: — "This part of Newgate was begun to be repaired in the Mayoralty of Sir James Cambel, Knt., Anno. 1630, and finished in the Mayoralty of Sir Robert Ducie, Baronet, April, Ann. Dom. 1631; and, being damaged by the fire in 1666, it was repaired in the Mayoralty of Sir George Waterman, Ann. Dom. 1672." He further says: — "Here are these arms: Sable a Fess Chequy or and azure with an annulet for a difference." He also refers in laudatory terms to the interior economy of the gaol. Meanwhile, the prison had been refronted — in 1638; and during the Commonwealth the Phoenix tavern, in Newgate-street, was added thereto. The repairs of 1672 are said to have been carried out by Wren.

Having compared various accounts of the interior arrangements of the gaol at this stage of its history, we find they all differ, and this not only in the names but in the situations of the several rooms. Yet since Major Griffiths's recent work\* should be the most correct in this regard, we classify his particulars as follows: — The wards consisted of four divisions, known as the Master Debtors' (1), Common Debtors' (2), Master Felons' (3), and Common Felons' (4) Sides. We find that the ground-floor comprised to the north, part of the Keeper's House, beneath it the Condemned Hold; to the south (along the street), the Lodge; Jigger, or visitors' room, and having below the drinking-cellar (3); Stone Hall (2), and Partner's Room within; Stone Hold (4); (along the back) Hall Ward (1), being 21 ft. by 15 ft.; Tangier (2); and Lower Ward (4); west of Stone Hold and Lower Ward was Yard of Press Yard, or exercising-ground. First-floor, north, — Stone Hall (1); My Lady's Hold; Middle Ward (4) — south, King's Bench Ward, 21 ft. by 15 ft.; 15 ft. First Ward (3); and west of these, part of Press Yard. Second-floor, north, the Billbows; Press Room; Jack Ketch's Kitchen; Waterman's Hall for women (4); Debtor's Ward (2); south — Second and Third Wards (3); part of Press Yard; west of these, and overlooking Holborn-hill, was the Castle. Third-floor, north — Second Ward, for women (3 and 4); Women's Ward (1 and 2); High Hall, 33 ft by 28 ft 12 ft. (2); south — the Chapel. The Women's Second Ward on this floor corresponds with the "Red Room" up to which Jack Sheppard made his way, and so through the chapel, on to the lower and upper leads on the night of Oct. 15, 1724. Major Griffiths avers that Harrison Ainsworth's graphic account of this feat is in substance authentic; he quotes from it in his book. We fancy that Cruikshank's illustrations of the escape are based upon a set of views published by T. Bowles and J. Bowles [no date]: —

In the year 1766 an Act, 7 Geo. III., was

\* "The Chronicles of Newgate." By Major Arthur Griffiths, one of H.M. Inspectors of Prisons. (London: Chapman & Hall [Edit. 1864].)

† Where so otherwise indicated, we pass in each floor from west to east.

‡ Many escapes have been made on one or two occasions by tearing up the cellar floor and so through the sewers. On March 10, 1716, Thomas Forster got away in the night, and on May 4, some years later, Brigadier Macintosh and fifteen others overcame the warders by sheer force and released themselves.

passed authorising the Corporation to raise moneys for divers useful works at 3½ per cent. interest, payable by a tax of 6d. per ton upon coal or culm imported into the City. Of these moneys £50,000 was apportioned for the rebuilding of Newgate. Eleven years later another Act was obtained for further subsidies in that behalf. The work, indeed, proved more expensive than was anticipated. The foundations alone cost £19,000. As the site chosen lay over the wall ditch, it was found necessary to excavate to a depth of 40 ft. for a solid base whereon to lay the brick vaulting. In exchange for the new prison and sessions-house site the Corporation surrendered to the public a plot of land at the corner of Old Bailey and Newgate-street, estimated at that time as worth 10s. per foot, running measure, and at 15s. for building purposes. They spent, moreover, out of their own funds £14,464. 13s. 9d. upon the sessions-house, and £8,250 in purchasing the freehold of some houses for making better approaches. For this work George Dance, City Surveyor, was employed. His prison elevation, 99 yards long, is so impressive, yet so plain and unadorned, that every one of the rugged, weather-beaten stones seems eloquent of its purpose. On the page of Ferguson's volume which is quoted above will be found a drawing of the original elevation, showing the pediment of the central house, which was afterwards replaced with an additional story above the cornice. The inclination of the ground, southwards, along the whole front is now 7 ft. 3 in. below level. Dance's plan embraces a central block and two wings. In the central block stands the Governor's quarters, between two turnkey's lodges, which are distinguished by the fetters above their portals. Behind the house is an arcade bearing the chapel. The remaining area of the central block was assigned to the Men Felons' quadrangle, wards, taproom, and a range of cells for the refractory. This quadrangle is now subdivided, and in one of the two exercising courts stands the shed which contains the gallows. The ward and cells to the east have been converted into day-wards and an infirmary. In one of the day-wards stands the whipping-block. The southern wing formed the Women's and State-prisoners' side. The northern wing was appropriated to debtors, and had its own taproom, quadrangle, and wards. The first stone of this building, whose outer wall is nearly 4 ft. in thickness, was laid on May 31, 1770, by Lord Mayor Beckford, who died on June 21 following. Seven years afterwards the old gaol was finally demolished, a portion of its site being taken for the ordinary's house in Newgate-street, and the north-eastern corner of the new block. The larger wards measured about 38 by 15 ft., the smaller wards about 24 by 15 ft. The chapel was built to admit 350 people, a number that was largely exceeded when the public were permitted to crowd in to hear the condemned sermon. Its interior has since been altered, and though the condemned yet sit apart from his fellows, a stove occupies the place of the central condemned pew, with the coffin which did duty there. Each of the two condemned wards, communicating with the press-yard between them, measured 31 by 18 ft. The condemned cells, of stone, and vaulted, were ranged on three floors, five cells to a tier. Their areas, as given by John Howard, who surveyed the gaol in 1779, ranged from 9 ft. to 9 ft. 6 in. by 6 ft. Some water-colour drawings of these are in the copy of Pennant's "London" (Soane Museum), which belonged to Fawcett, who was hanged at Newgate on Nov. 30, 1824, for forgery. This prison was unfinished when, on June 6 and 7, 1780, it was pillaged and burnt by the "No Popery" rioters, who — bent upon freeing their own comrades — set some 300 prisoners at liberty. Their attack, at first directed against Governor Ackermann's house, was witnessed by the poet Crabbe, then friendless in London. Dr. Johnson, in company with Lord Stowell, went to Old Bailey, where, as he writes to Mrs. Thrale, "the Protestants were plundering the Sessions House. . . . There were not, I believe, a hundred, but they did their work at leisure, in full security, without sentinels, without trepidation, as men lawfully employed in full day. Such is the cowardice of a commercial place." The damages involved a further outlay of 30,000l., of which the greater part was voted by the Commons.

Upon the advocacy of the philanthropist Howard, the place of execution was removed from Tyburn to Old Bailey in December, 1783, when, as we gather, was pulled down the block of mean houses — Middle or Hart-row — at the northern end of the street. Henceforward



"black Meggie" was put together overnight, as occasion required, before the door—still known as the "debtors' door"—in the northern wing. The apartment within now serves as a kitchen. The doorstep is 2 ft. 1 in. above the footpath; beneath, and on either side, remain six staples by which the scaffold and steps were fastened on to the prison wall. These form the last external relics here of public executions, abolished in 1868. On the building (1813-5) of Whitecross-street prison, William Montague, architect, the confinement of debtors ceased in Newgate, and their wing was added to the felons' side. By 3 Vict., cap. 56, it was enacted that prisoners might be lawfully kept in solitary confinement. On April 10, 1840, was laid the first stone of Pentonville Model Prison, on Colonel Jebb's plan, for 520 cells, at a cost of over 90,000. Several prisons, upon the separate system, were speedily built in different parts of the country. A proposal to enlarge Newgate resulted in the construction of Holloway City prison, which was opened in 1852. The design is by Bunning, who introduced some fantastic elements copied from Warwick Castle. But the condition of Newgate still called for amelioration. In 1857-9 the felons' side, northern wing, was reconstructed within the outer wall, so as to contain 150 cells, with two cells, double-sized, for the condemned, and twelve more for reception and punishment. Within the next three years, nearly fifty cells were ready for women in the southern block. By the Prisons Act of 1877 the management of all our prisons was committed to the Home Office, and under a new scheme for concentration, Newgate was no longer required, save for the detention of prisoners awaiting trial during sessions, or under sentence of death. On opening sessions at the Central Criminal Court on January 30, 1882, the Recorder prefaced his charge to the grand jury with some interesting observations upon the events which, since the last previous commission of 1835, had rendered it necessary to issue a new commission of oyer and terminer and general gaol delivery. Having spoken of the City wall, we will add that the so-called "Bird-cage Walk," which forms one of the approaches from the prison to the Court, runs along what we are informed is a fragment of the ancient wall. On the wall-side are cut the initials of some of the criminals, who after execution are buried beneath the flagstones, a grating, open to the sky, being overhead.

#### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary meeting of this Institute for the present session was held on Monday evening last, at Conduit-street, Mr. Alfred Waterhouse, R.A. (President), in the chair.

##### Obituary.

Mr. W. H. White (Secretary) announced the decease of Mr. C. F. Hansom, of Bristol (whose death was recorded in the *Builder* a fortnight ago, p. 423, ante), and Mr. Henry J. Paull, of London, and lately of Manchester, Fellows.

##### The Ashpitel Prize.

Mr. J. Macvicar Anderson (Hon. Sec.) said that at the last meeting of the Institute, the names of those candidates who had passed the recent Examination in Architecture held in London were announced. It was then stated that from want of time the Board of Examiners had not been able to make their recommendation to the Council in respect to the Ashpitel Prize, which was awarded to the candidate who, throughout the examinations in one year, had obtained the highest marks. The Board of Examiners had now recommended that the prize should be awarded to Mr. Henry Ernest Stelfox, of Manchester, who had most highly distinguished himself throughout the two examinations held in London, and the one held in Manchester during the past year. Two gentlemen ran Mr. Stelfox so extremely close in point of merit that the Board of Examiners had recommended that an unusual prize should be given to each of those gentlemen, viz., Mr. Paul Waterhouse, M.A. London, and Mr. Henry William Burrows, London. It was a source of gratification to have the pleasure of awarding a prize of merit to the son of one so justly respected as was their President (applause).

\* For list of the names, see *Builder*, p. 436, ante.

##### Election of Members.

A ballot then took place, when the following new Members were elected, viz.:

*As Fellows.*—Messrs. Henry Lord, Manchester; Henry Bridgford, Manchester; William Horton, Manchester; John Ely, Manchester; John Littlewood (Associate), Manchester; William Henry Littlewood (Associate), Manchester; Joseph Stretch Crowther, Alderley Edge; John William Tronson, Penzance; James Maxwell, Manchester; William Charles Tuke, Manchester; Thomas Edward Bridgen, Manchester; Edward Schröder Prior, M.A., London; Oswald Cane Wylson (Associate), London; and William Taprell Allen, London.

*As Associates.*—Messrs. Philip Edward Barker, Manchester; James Diggle Mould, Manchester; and John Arthur Berrington, Liverpool.

The President added that it must be gratifying to the Members to find so many of their Manchester brethren coming up for admission as Fellows (hear, hear).

##### Musical Requirements in Church Planning.

Mr. John Belcher next read a paper entitled "Musical Requirements in Church Planning." The following is an abstract of the paper:

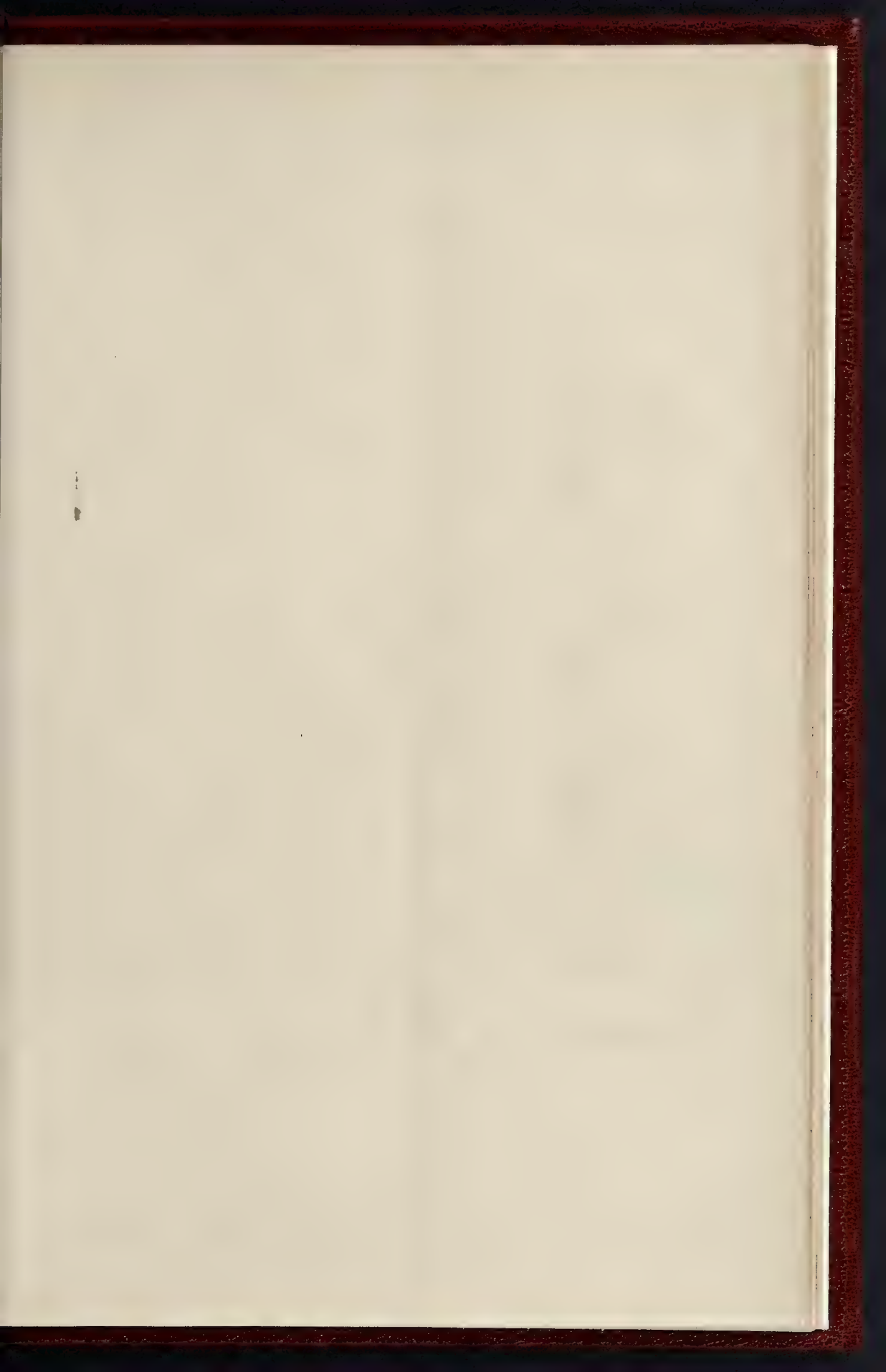
The author considered that the development of ecclesiastical music of late years forced certain problems upon the attention of the architect, and that in church planning the position of voices and instruments had now to be considered. The first introduction of organs was in the seventh century, but they were generally used in conjunction with other instruments. Minstrels' galleries might still be found in small churches, the west end being the favoured position. During the period from Henry VIII. to Queen Elizabeth instrumental music was still adhered to, but the objections of the Puritans were such that in 1643 nearly every organ in use had been destroyed. From the Restoration, however, to the present day, organs were recognised as essential. It was only fifty years ago that 32-ft. pipes were first used in England, although on the Continent the organ became very large at the end of the fifteenth century, reaching a climax in the seventeenth and eighteenth centuries. In most cases they were forced to migrate from the chancel to the west end, in some to the transept, and where neither position was available they were relegated to the triforium of the nave. The choir being seated in the chancel, the position of the organ near them seemed essential, but other eventualities, such as additional bodies of singers and an orchestra, had to be remembered. In future church planning these requirements would have to be considered. The organ should be in a position not less or much less in height than the nave and transepts, the so-called "organ-chamber" being a mistake. The size of an organ should not be regulated by the size of the building, but by the number of "stops," the combination of which regulated the extent of the volume of sound. A good foundation tone was always necessary, to secure which speaking-room had to be provided for 8-ft., 16-ft., and even 32-ft. pipes on the pedal-organ. These dimensions had to be considered in providing sufficient space. The top of a chancel-screen or rood-loft was hardly a suitable position for an organ of any size, as, although it possessed attractions from an artistic point of view, it was prejudicial to the organ tone. Organists and organ-builders generally considered that in fairly large churches the organ should be raised about 12 ft. above the ground, and a divided organ could not be recommended. Proper and easy access to every part for repairs and tuning should be provided, and attention given to the position and space for the "feeders." An equable temperature was also important. The organ-case might be treated as an enclosure, in the way usually adopted by the Italians, having no special relation to its contents, wholly or in part concealed; or in the general, and as the author thought appropriate, way, of using some of the pipes work enclosing the other parts of the organ. The use of iron in the construction of an organ-case he protested against, while wood was a material in sympathy with the organ, and the most consistent for the construction of its case. Sound travelled so slowly that any division of choir-organ or orchestra was destructive of precision, and they should therefore be compactly arranged, and as far as possible on the same plane. Mr. Belcher then described a sketch of a plan by himself to illustrate his meaning. The organ was placed in a special transept, east of the great transept, equal in height to the rest

of the church, and forming the western end of the morning chapel; it was virtually open on three sides, but was slightly sheltered; outside the main wall, and between the buttresses, a staircase with a wide landing served as a tuning place for an orchestra before entering the gallery; this gallery, projecting into the chancel, gave space for an orchestra, which might be extended eastwards if required. The floor of the organ was 12 ft. from the ground, the music gallery was lower, and as the floor of the chancel was raised by steps, all the performers were brought into close relation with each other and the organ. The usual north transept afforded an excellent position for grouping large bodies of voices adjoining the organ and orchestra, and easily under the control of a conductor at the western angle of the gallery. A corresponding gallery on the opposite side of the chancel would provide for female singers at ordinary services.

The President said he would call upon Mr. Statham, who was both an architect and a musician, to open the discussion.

Mr. H. H. Statham proposed a vote of thanks to Mr. Belcher for his exceedingly practical paper, which had the merit of showing how much useful suggestion could be got into a very short space. To have the subject taken up from a musical point of view by an architect of Mr. Belcher's ability showed that architects were coming to consider the importance of the subject, and to look at it in a practical manner. After the remarks which had been made that evening, he hoped they might all feel that the "organ-chamber" was doomed. He had suffered from that for many years, for to put an organ in such a position was one of the most cruel things that could be done. The difficulty, however, was that the subject was a complicated one, which could not be considered purely from the musical point of view. The architect had to consider, in the first place, ritual; in the second place, the position of the organ with regard to the singers; and, in the third place, the painful subject to which Mr. Belcher had referred, viz., money. Now, ritual was a thing he (Mr. Statham) did not profess to know much about; but he believed that if they proposed, in accordance with some of the illustrations shown, to put the organ at the end of the chancel, or behind the high altar, most clergymen would look rather black upon them. Musically speaking, however, he considered that to be the best position for the instrument. The organ should have a central position, where it would sound well down the church; it should be near the choir, which again should be in front of the congregation in the chancel; so that all these requirements tended to indicate that position, unorthodox as it was, as the best from a musical point of view. Next to that, there was no question that the best situation, especially for a large organ, was the old position at the west end. Such an instrument as would be placed there was, of course, far larger than was necessary to accompany the choir, but it must be remembered that the organist also wanted to show off his powers, and play his fugue after service. An organ placed at the west end was, however, in a disadvantageous position for supporting the choir. There was one way out of the difficulty, which Mr. Belcher appeared rather to object to, viz., the long movement system, for which we had now the aid of electric action. In a large church, and where there was plenty of money, the solution would be to have a small choir-organ close to the singers, and a large organ, for grand musical effects, at the other end. Both instruments could be controlled from the same key-board, and he was compelled to differ from Mr. Belcher when that gentleman said it was a disadvantage for the organist to be away from his instrument. So long as the connexion was all right, it was rather an advantage than otherwise, for the player near a large organ seldom knew fully what he was doing, or how the instrument sounded at the other end of the building. Therefore, when there was unlimited money, it would be well to have a small organ to support the choir, and a large one for grand organ purposes, and for accompanying the congregation when necessary. With regard to the choir-organ on the screen, after many years of hearing and playing cathedral organs, he believed that if an organ sounded harshly in that position, it was the fault of the instrument. It was curious to hear this position now referred to as architecturally good but musically bad; a century or two back the opinion was the reverse, and Wren

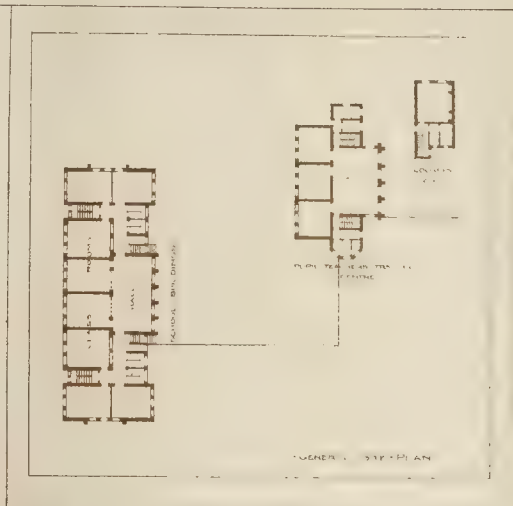




SCHOOL BUILDING FOR LONDON  
LEINSTER HILL, SCHOOLS  
THOS. J. BALEY, ARCHT.





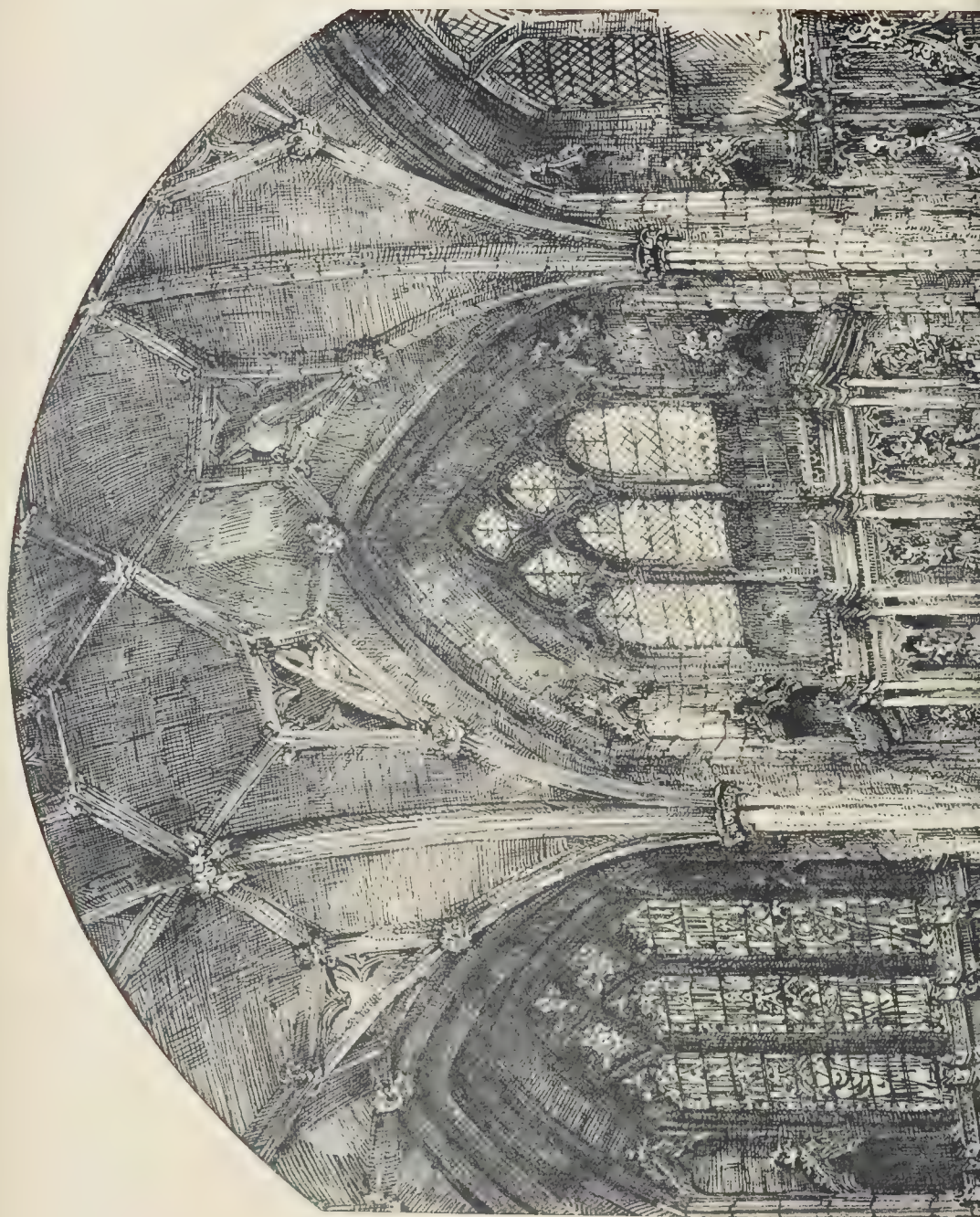








THE BUILDER. DECEMBER 22, 1888



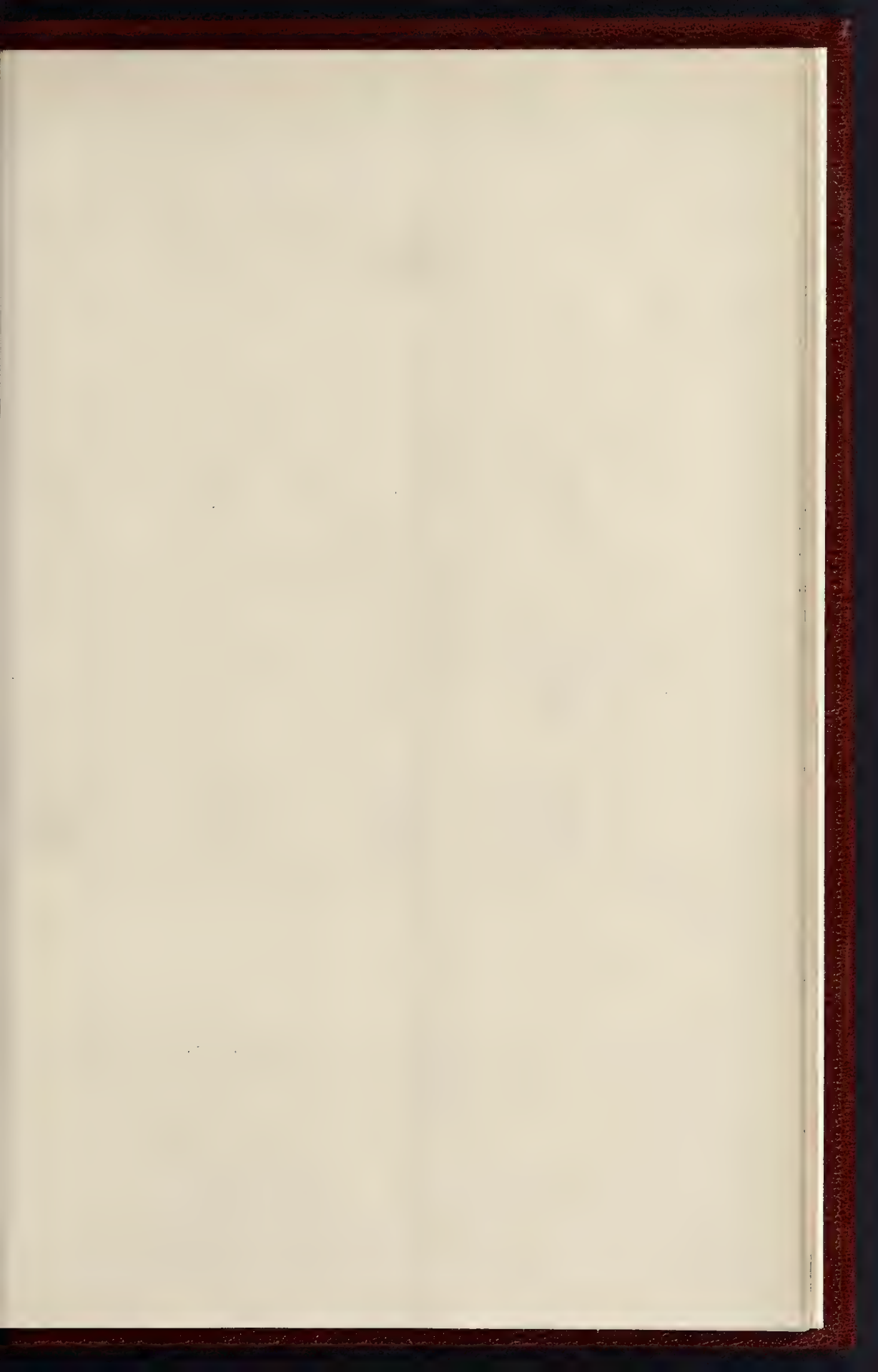


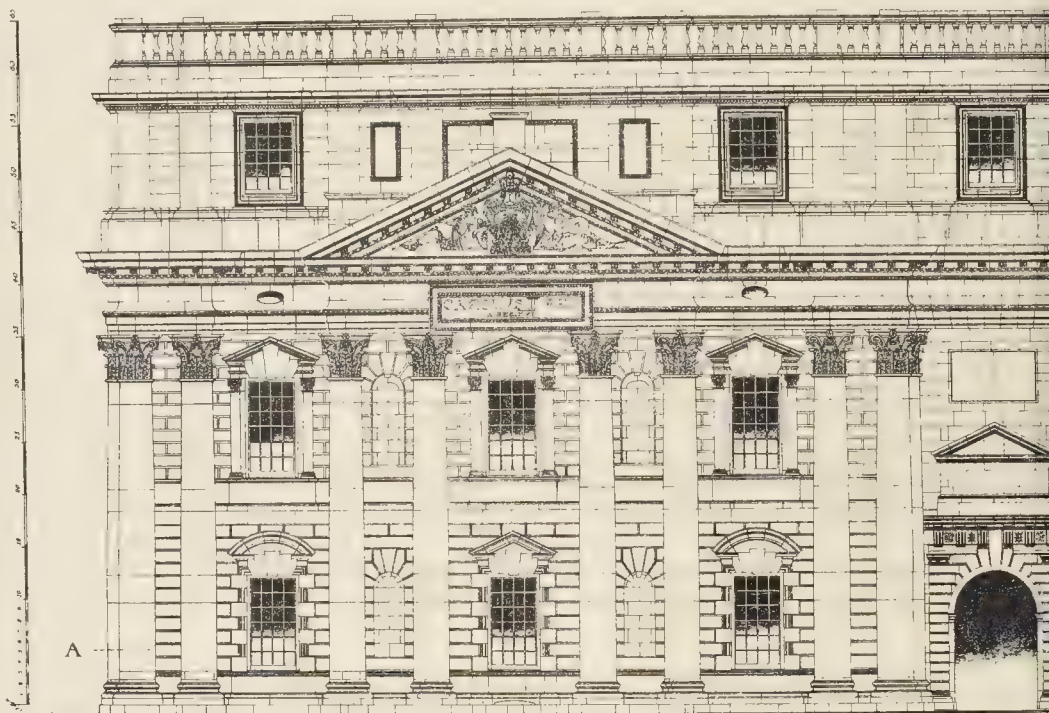


THE TRIFORIUM, WELLS CATHEDRAL.—DRAWN BY MR. A. BERESFORD PTE, A.R.I.B.A.



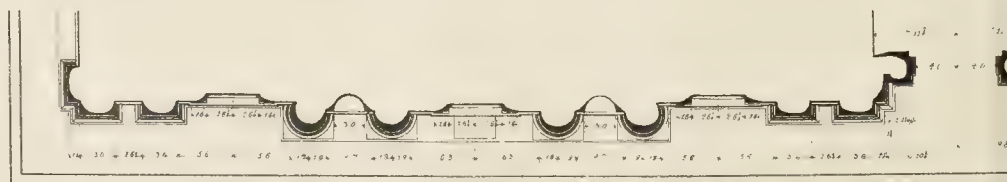






VERTICAL  
SCALE  
OF FEET

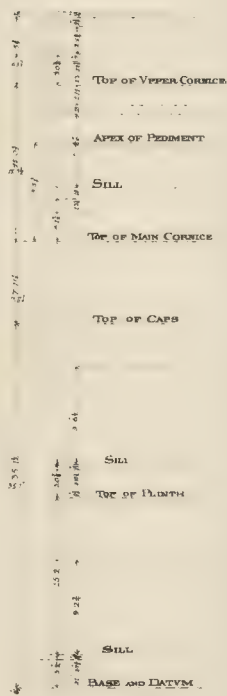
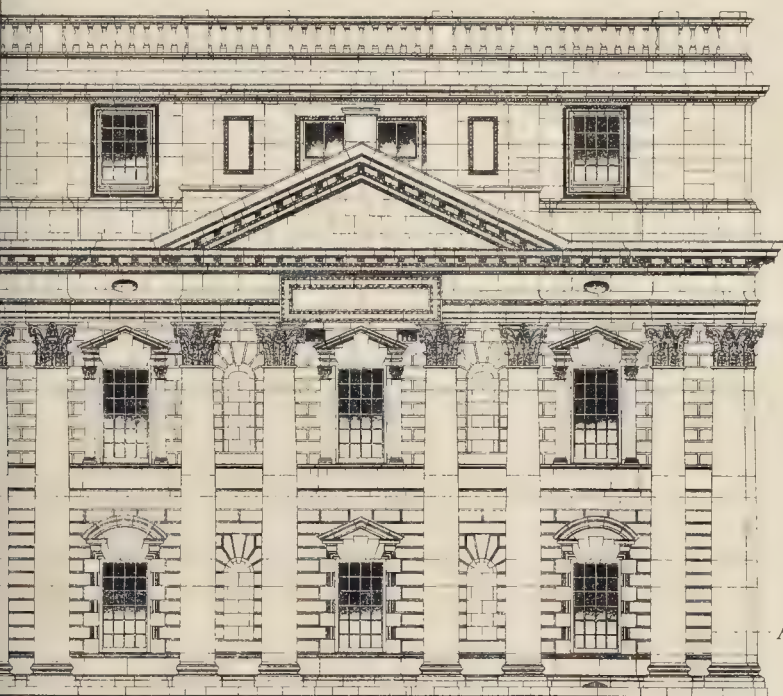
ELEVATION  
FACING THE F



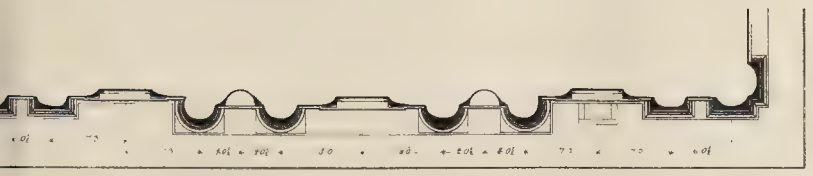
PLAN AT LEVEL

SCALE OF FEET 6 - ONE INCH



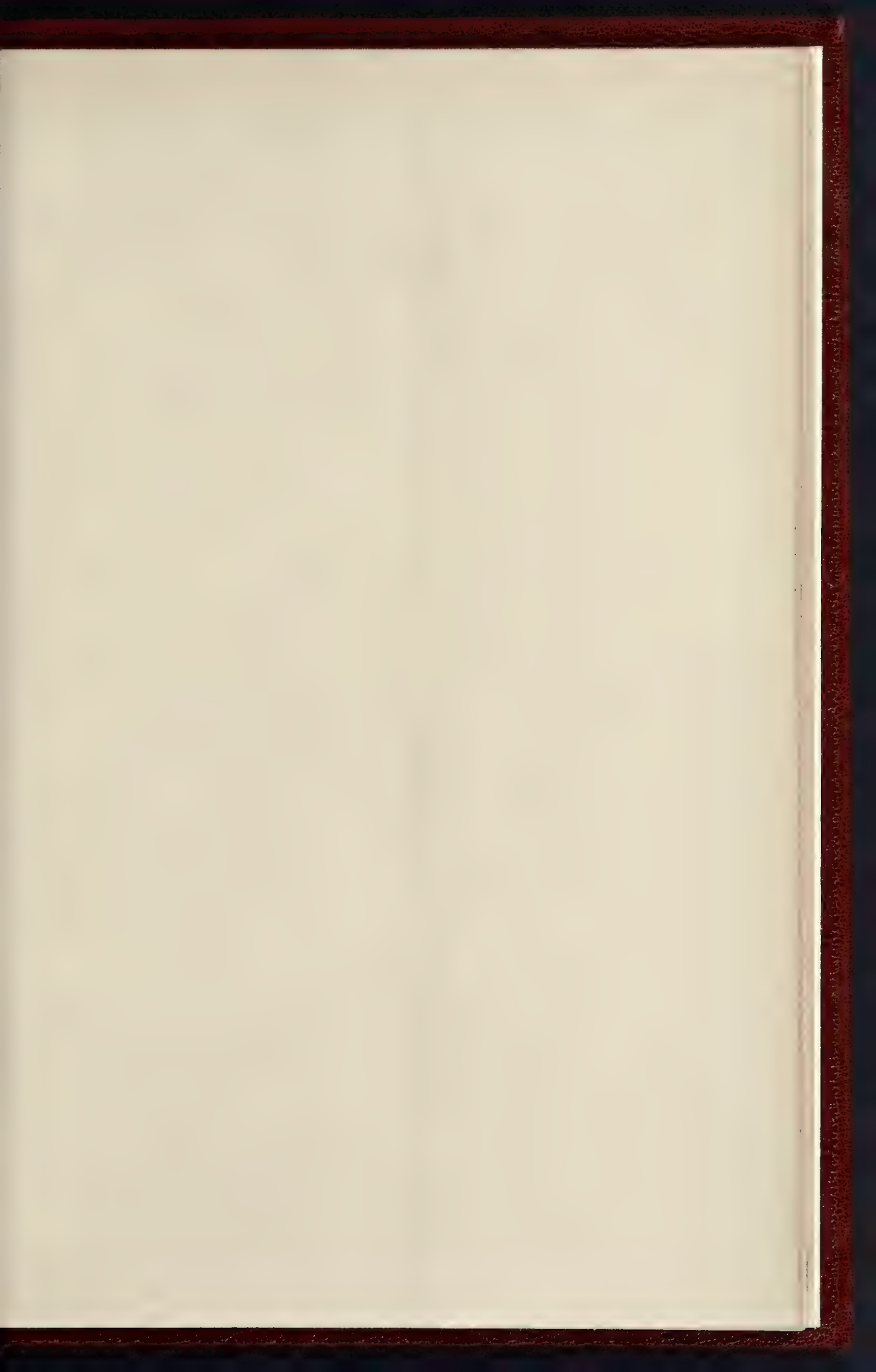


SKELETON SECTION  
OF  
DIFFERENT HEIGHTS



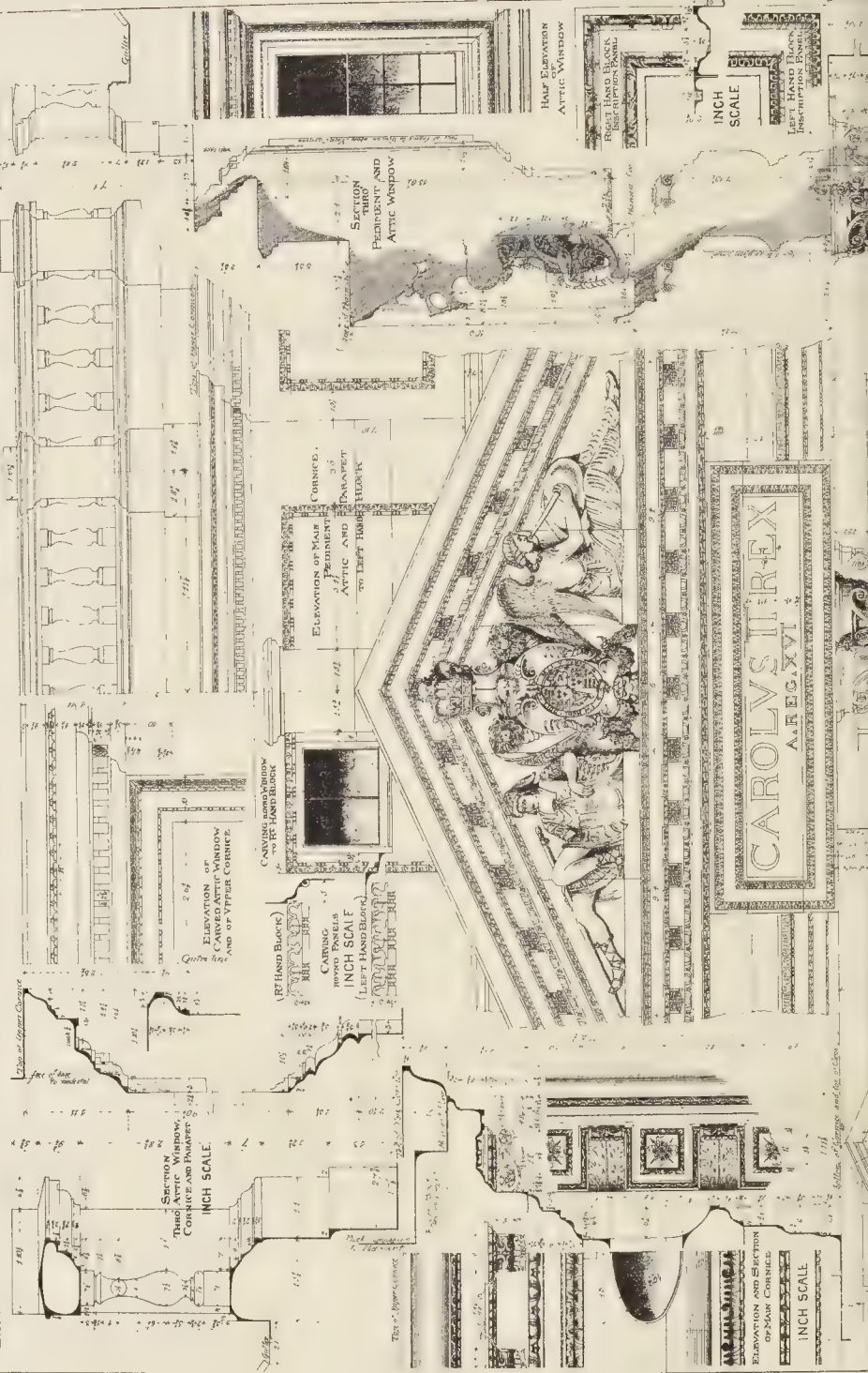




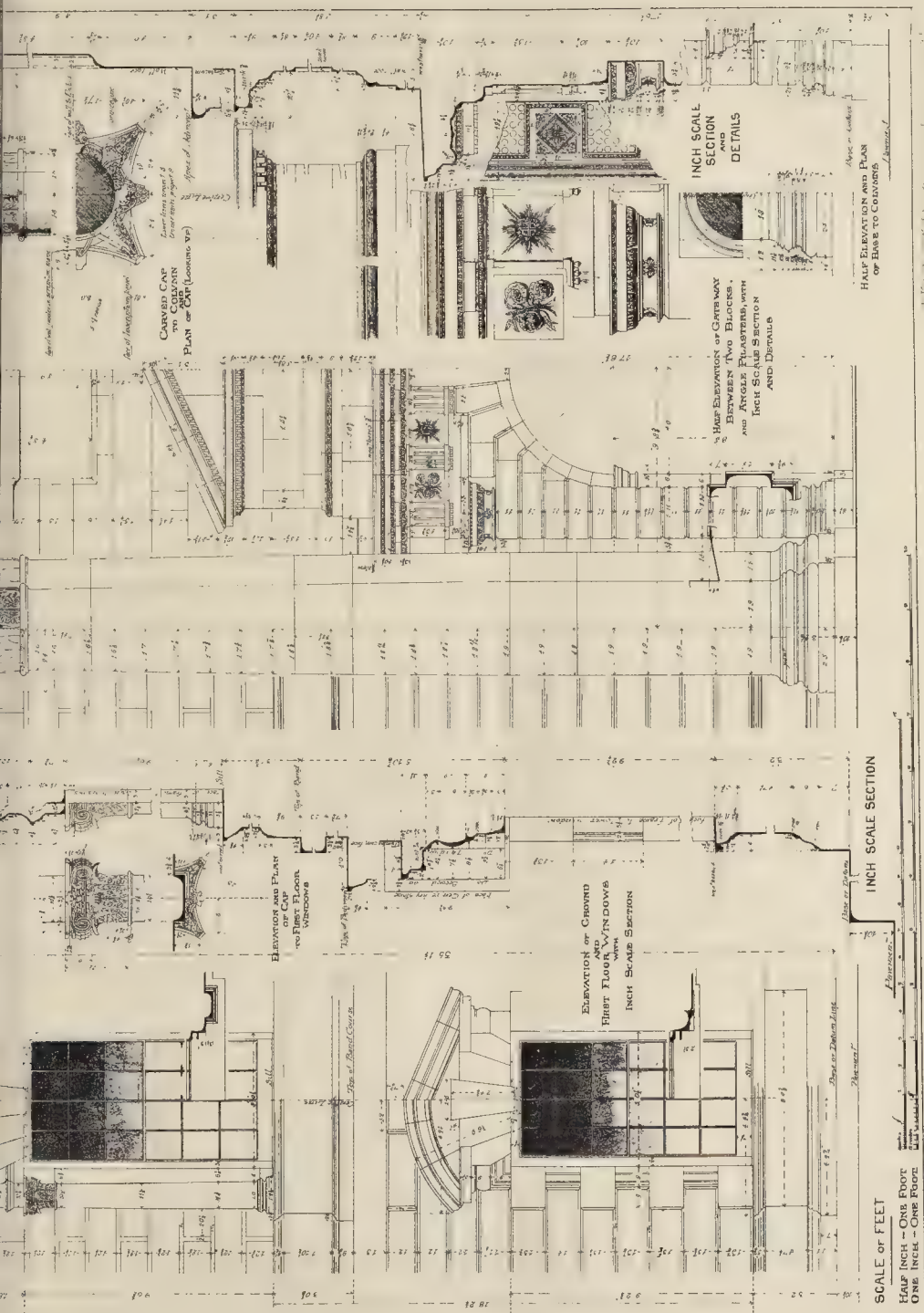


R. A. ARCHITECTURAL SCHOOL  
MEASUREMENT DRAWINGS FOR 1888

SCALE: HALF INCH - ONE FOOT  
EXCEPT ENLARGED DETAILS AND SECTIONS WHICH ARE ONE INCH - ONE FOOT







KING CHARLES' WING, GREENWICH HOSPITAL.—MEASURED AND DRAWN BY MR. C. S. HAYWOOD.  
DETAILS OF FRONT.





complained that St. Paul's was spoiled by the prominence given to the "box of whistles." He (Mr. Statham) thought that musically the position was a magnificent one, the instrument having full space to develop its sound; but the reason why the organ was taken off the choir-screen in cathedrals was that it began to get so large, and the system of sticking it all about the building was then adopted. He was astonished, on his first visit to Worcester Cathedral, to find the organ-pipes standing about in all directions in the choir aisles; and that, of course, took away all unity from the instrument. In a cathedral where there was a large organ, he would be inclined to put the manual-pipes in the old position on the screen, and the pedal-pipes by the side down below. From a musical point of view, he maintained that the old screen position was a fine one, and if the organ sounded harsh there, it was probably a bad instrument. He very much agreed with what Mr. Belcher had said as to some of the modern organ-cases, and the mere sticking-up of the pipes without any attempt at design, so often to be noticed. He liked to see the pipes in the front of the instrument, better than a mere ornamental case, which had no suggestion of an organ. The pipes, however, should not be taken far from their wind-chest. When pipes were taken off the place whence they received their wind, the wind was conveyed to them by tubes, and it was desirable not to have these too long and too complicated; so that when an architect was planning a case for a large organ, he should be content with a few pipes in front, and let the organ-builder have the pipes as near the sound-board as possible. Sometimes the pipes were planted here, there, and everywhere, and the unfortunate builder was at his wit's end to get the wind to them. In regard to the design of the cases, the large pedal-pipes were mostly of wood, and were generally kept in the background, but he had sometimes thought they might be made fine use of in designing, as a contrast to the metal pipes. One place where they had been so used was at St. George's Hall, Liverpool, where Cockerell designed the organ-case, placing the metal-pipes in front, and putting the 32-ft. wooden pedal-pipes in a semicircle behind the organ, where they formed a fine background to the design of the front.

Mr. William White seconded the vote of thanks, and said that this was a subject which he did not remember having heard discussed by the Institute before, though it was one of the most practical questions of English Church arrangements with which architects had to do. He entirely agreed with Mr. Statham as to the necessity for two organs in large buildings. These would hardly be required in the case of small buildings, but in large buildings there ought to be a choir-organ and an organ for purposes apart from the choir. The choir-screen was a very good situation for the choir-organ if it was kept sufficiently low, and prevented from interfering with the general effect of the building; in other words, a large choir-organ ought not to be erected in a small building in a position that it would entirely screen the architecture of the chancel, and bring the pipes so near the roof as to be unpleasant. Reference had been made to the western organs in the Roman churches, but he did not think it was quite a question as between the Roman and English Churches in regard to that matter; the question was as regards the manner in which the service was conducted, because in the English Church they had chiefly to look to the congregational use of the organ; or, in other words, it was to be a congregational service, and not merely an æsthetic one. There were portions of the service which ought to be æsthetic, and to be merely listened to by the congregation, and on that account the western organ was essential. A great deal had been lost in the English Church by the utter abandonment of the orchestral support of the singing, and its being superseded entirely by the organ. That was caused, no doubt, by the very low and slow dreary tunes which the old performers in the western gallery used to play, and which some present might remember. When there came a change in the services of the Church, there necessarily came also a change in the descriptions of the accompaniment; and instead of its being a reformation, reforming the orchestra in the western gallery, there was the radical measure of simply sweeping it away. As regards the purpose of the æsthetic part of the service, it was impossible to look for any æsthetic service in the bulk of village churches; therefore the service must be almost exclusively

congregational, supported by the choir in front of them, and not drowned by the organ. There was no doubt that the organist, thinking of musical effects apart from the congregational service, would strive for a large organ, and, he believed, there was not one organist in ten who did not care more for his organ than for the choir. With regard to placing the seat under the front of the organ, he had met organists who very much preferred that arrangement, because it gave them a little shelter from the great noise of the instrument. His first desire in constructing an organ-case was to ascertain the views of the organ-builder and the organist, and then to adapt them to the purposes of the building.

Mr. C. F. Hayward said he was particularly pleased to hear what Mr. White had said, because he felt that organs were very often overdone in churches, not only in the manner in which they were used by the organists themselves, but by the organs being made too large for the building. He knew a case in point where they had not suffered from the unfortunate disease of want of money, but where, on the contrary, they had had rather too much of it, and where it would have been really better had a few hundred pounds less been spent upon the instrument. The result of it was that the pipes reached the top of the building, and he was afraid if the organ was played at its full power it would almost blow the roof off. The result of this organ was that every time the service was performed the choir was drowned, and the congregational worship was overridden by the amount of actual noise that came from this huge "box of whistles." This same instrument was blown by hydraulic power, which was applied in such a way that there was a continual squeaking going on even during the period of the service when there should be absolute quiet. That was, he believed, one of the difficulties connected with the hydraulic arrangement. It was delightful to him to hear Mr. White revive the desire for instrumental music of another kind than that of the organ. The organ nowadays seemed to take away all sort of interest in the instrumental music which used to be performed in the churches. He was old enough to remember when the village choir had flutes, violins, and every kind of instrument that could be employed in the service; but now it would be extremely difficult, he believed, to get such a support to the organ. When that occurred, it was extremely delightful to him, as in the case of some recitals he had heard in Westminster Abbey, where the organ was supplemented by violins and harps. With regard to cases, the finest organ he believed, in a secular building, was one with no case, and where the pipes could not be seen. He referred to that designed by the late Mr. W. Burges for the Speech Room at Harrow School. There the organ was placed behind the platform, which was 5 or 6 ft. away from the end wall, the place between the platform and the wall being occupied by the instrument. That seemed to bear out what Mr. Statham had said that the best position for the organ in a church was between the altar and the east-end, and if the altar could be placed some 10 or 20 ft. away from the east wall, the organ might be built behind it. As to placing the organ at the west end, he believed that the organ in Amiens Cathedral was placed 40 ft. high on brackets against the western wall. The effect was very fine when the choir-organ was being played, supplemented by bursts of music from the western organ, which gave the æsthetic effect that had already been spoken of.

Mr. Ralph Nevill observed that there were many tempting byways to lure them from the strictly architectural discussion of the subject. One of the most important practical points brought forward was that of placing the organ at the east end, behind the altar, which they had been told by Mr. Statham—who was an authority on the matter—backed up by Mr. Belcher, would be an excellent place as far as regards sound. If an architect went to an ordinary parson, however, and suggested such a thing, he would hold up his hands in horror; but, on the other hand, there were plenty of parsons who were always on the look-out for some novelty (laughter), so that he did not think it was absolutely hopeless that such a plan might be carried out. He himself did not see any possible objection to it, because most of the church builders were only too glad of an excuse for not having to put in an east window, because, for artistic effect, it was better without a light

there. It was not necessary to show the organ-pipes in such a position; but he saw no reason why the face of the organ towards the congregation should not be treated like a large reded, coloured with painting and woodwork. That would be a most appropriate cover and screen for the altar, and would add to the ornamental ending of the church, especially if it utilised the apsidal form. He specially if it utilised from studies he had made in connexion with sound,—that a certain amount of compression was desirable to give the full value and volume to the sound which came from the organ, and he also considered it would be well to have the organ a little way off from the choir. By so doing the choir would have a better chance of being heard than where the organ came nearer to the congregation. Mr. Statham had spoken of the screen being a good place for the organ, but that depended upon where the congregation were seated. In a cathedral there would be sometimes the congregation in the choir, and sometimes the congregation in the nave. When the congregation was in the choir, the screen might be a good place for the organ, because then the organ was further from the people than the choir. But he did not consider it was a good plan to have the choir in the ordinary place, and the organ standing between them and the people in the nave. No doubt a western gallery was the finest place for the organ. At the Pro-Cathedral at Kensington, in Monsignor Capel's time, they had the most magnificent singers, and the effect of the music from the fine organ rolling over the congregation was certainly superior to anything he had heard. But then came in the difficulty that it was necessary to have the choir-organ as well, and he could not agree that an organist could produce the best effects on detached organs by means of electricity.

Mr. E. J. Tarver said that in Mr. Belcher's plan the organ was placed on the north side, and he believed that organ-builders considered that the best place for equality of temperature.

Mr. George Aitchison, A.R.A., said that there was little of the beautiful to be seen in the organ-cases. In fact, he only remembered one which showed any merit, viz., one at Siena, to be seen in Mr. Hill's book on organs. The Spaniards also were the only people who set out their organ-pipes like the trumpets to be seen on the bassi-relievi of the ancient Romans. The vote of thanks was then put, and carried by acclamation.

Mr. Belcher, in replying, said that Mr. Statham had spoken rather from the organist's point of view, while he had rather treated the subject from that of the architect. When the organ was put on the screen, the volume of sound was apt to overshadow the voices of the choir when the congregation were in the nave, and that arrangement was only adapted to an organ of small size. For ordinary purposes, where the choir were seated in the chancel, the west-end organ was inconvenient. He had been rather considering the best position for the organ in a moderately-sized church, in which case it would hardly be wise to provide two instruments, though in a cathedral some such arrangement might be attempted. He gathered from Mr. Statham that both organs might be played from the chancel. (Mr. Statham: "It has been done.") He did not think it had been very successful, because a good deal of the organist's touch must be lost. The Amiens Cathedral organ was a fine one, but, even in that case, there was a little too much reflected sound. The Haarlem organ had the advantage of being spread out, so that it could all be seen. It had no swell, and therefore required a great number of stops to give diversity. Plenty of space was necessary for an organ, so that there might be easy access to every part of it from the inside. The proceedings then terminated.

**Trade Smoking Concert.**—On Saturday last, Dec. 16, the office staff of Messrs. Wm. Brass & Son, Old-street, St. Luke's, held their fourth annual smoking concert at the "Falstaff," when the clerks and friends to the number of 300 spent a very enjoyable evening.

\* This is quite an illusion. Mr. Belcher and others who objected to this idea are probably not aware that in English all large organs of the best make are now built with artificial mechanical means of helping the touch, even when the keyboard is close to the organ. The object is to save muscular labour to the player, which becomes considerable in the action of a large organ. There is, therefore, already an artificial touch interpolated between the player and the valve, and when once this is done the distance, more or less, between the two makes little difference. You could not tell by the mere feel of the key whether there were five yards or fifty yards between it and the pipe.  
—Ed.



## Illustrations.

THE TRIFORIUM OF THE PRESBYTERY,  
WELLS CATHEDRAL.

**T**HE drawing shows portions of three bays of the south wall of the Presbytery, which illustrate an eventful period in the history of the Cathedral. The ground story arches to the right are those of Bishop Jocelyn's choir (1206-42), while that to the left is the work of Bishop Drokensford, who added three bays a century later, the crown of the Bishop's throne just concealing the junction. The singular disregard of the Mediaeval architects for the inventions of their immediate predecessors is remarkably illustrated in the design of the triforium story, which, with the whole of clear-story and vault, was continued from Drokensford's eastern bays over Jocelyn's earlier work as far as the crossing. The string course over the great arches is not continued, and there is an alteration of level at the cornice of the triforium, entirely Drokensford's work, which is probably intended to emphasise the general freedom of treatment. A. B. PITE.

## BOARD SCHOOLS, LAVENDER HILL.

The proposed Board School at Lavender-hill, Clapham Junction, will accommodate 800 children, and will be erected with a capacity for extension to 1,600. It will be of three stories, for boys, girls, and infants, and graded in the ordinary manner.

Upon the same site (which is an extensive one) will be erected a school for the instruction of pupil teachers, containing approximate accommodation for 216, and consisting, on the ground-floor, of three class-rooms for thirty-six each, with a large assembly-hall (suitable for examinations, lectures, &c.); on the first-floor three similar class-rooms, and a large chemical laboratory; and on the upper floor a drawing class-room, with covered and open gymnasia. The pupil-teachers are taught in mixed classes, but have their separate entrances and exits, cloak-rooms, lavatories, offices, &c. The class-rooms will be seated with single desks.

The general scheme will also include upon the site a school for instruction in cookery, and a house over same for the school-keeper.

The illustration is reproduced from the drawing in this year's Exhibition at the Royal Academy. The architect is Mr. T. J. Bailey, architect to the School Board.

THE CHARLES II. WING, GREENWICH  
HOSPITAL.

THESE measured drawings of a very good bit of Wren's work were made by Mr. Haywood in competition for the Royal Academy silver medal for drawing of this class, which was awarded to him. The details are carefully given, and should be of interest to some of our readers in the present enthusiasm for architectural detail of this class.

It should be observed that the notes as to "inch scale," "6—one-inch," &c., on the drawing, are not correct on the reduction; they apply to the original drawing, which was on a much larger scale. There were too many of these notes of scale to make it convenient to remove them in the lithographed reduction, but there are sufficient drawn out scales and figures to give the correct data as to scale.

**No. 78. Cornhill.**—In reference to this building, illustrated in our last, we learn that the brick panels typical of Marine Insurance, to which reference is made in our description of the building, were modelled and carved by Mr. Gilbert Seal.

**Boyd & Sons' New Stoves.**—An "Automatic Ventilating Stove," just patented by Messrs. Alexander Boyd & Sons, offers a very convenient means of drawing a current of fresh warmed air into a room, and extracting the vitiated air. The stove has hollow chambers beneath and at the sides, into which air is drawn from an inlet communicating with the outer air, and an extract draught is formed by the smoke-flue. It is simple in construction and in working, and likely to answer its purpose well. The same makers' "Patent Coke Battery," which we have also inspected, is the gill stove with some peculiarities; the gills are corrugated so as to increase the heating surface, and internally project into the fire so as to pick up as much heat as possible, and they are grooved together so as to leave no possible direct outlet for the heat from the fire. The heating efficiency of this stove, in proportion to the cost of fuel, appears very high. Both are for slow-burning coal.

## MR. BRETT ON DECORATION.

THE following is extracted from the paper, to which we have already referred, on "The Relation of the Pictorial to the Decorative Arts," read by Mr. John Brett at the Liverpool Art Congress:—

"Whilst it is the function of the artist to exalt natural images and to fix on canvas those that are fleeting and evanescent, it is the business of the decorator to take only such elements of them as can be harmoniously interwoven with the rigid forms of the structures to which they are applied without crippling their usefulness.

Now, the usefulness of the walls of a house, beside and beyond the rudimentary one of keeping the wind away, is to minister to the intelligence and taste of the dwellers therein. Inasmuch as the walls are perpendicular, they confront the spectator whichever way he turns, and are most favourably placed for being looked at; so that, if you possess any specially beautiful image, common sense dictates that it should not be painted on the ceiling, because your eyes are not conveniently situated for seeing it there. Neither would you place it on the floor, because you want the floor to walk upon, and for other practical purposes. The walls, therefore, are the necessary source of your intellectual entertainment, the home of your pictures and your books; and it is well known to cultivated people that no room can be attractive without pictures or books. It is true that it can be made comfortable by means of cabinet work, or wood-panelling, or upholstery, as in the cabin of a yacht; but this treatment violates one fundamental condition of good decoration, for it interferes with the usefulness of the walls, inasmuch as the intellectual entertainment to be got out of panels is not considerable. They have the advantage over plaster or whitewash, being of a pleasanter colour, and not so chilly to the touch.

Panels, of course, might be filled in with poetical or historical pictures or with views of the Himalayas; but there is a practical objection to this, viz., that portability is a valuable attribute of pictures, and that their shapes are necessarily dictated by the subjects you choose, whereas panels are permanent parts of the house, and their size and shape are not variable. The conclusion I arrive at, therefore, is, that walls should only be panelled below the line of sight, where pictures would be in danger and impede the free occupation of the room.

I do not refer to tapestry as a method of decorating walls, because, being portable, it may be considered as a form of pictorial art. The object of all these forms of decoration is to relieve the inmates from the distressing monotony of the blank wall enclosing them, the said blank wall being suggestive of a curtailment of one's liberty, and very consonant with the sentiment of a prison. The great desideratum is to vary the colouring of the wall, and for this purpose the area must be divided up, so as to provide for different intervals of colour in varied quantities.

This leads me to the practical inference that internal walls are best treated by what is known to architects as Diaper, which they sometimes pervert from its true use, that of a setting for colour, and carve in stone, as at the Law Courts. This I call illegitimate sculpture, because, being handwork, no more expense or trouble would be incurred in carving fine organic forms than mere geometrical ones frequently repeated. Diaper is quite harmless, if it be not obtrusively painted, on internal walls.

The true function of the floor is to be walked on. The function of the ceiling is to reflect light. The function of the wall is to serve as a background or setting for your guests and your pictures. In order to see these to advantage the background should be subdued in colour, so as not to intrude itself on your notice; also it is important that the upper part of it, or frieze, should be kept as light in colour as possible, so as to reflect light to the opposite wall. Nothing is more fatal to the usefulness or pleasantness of a room than a dark ceiling. Reflected light is necessary to enable us to see into the shades of objects, and if the light which enters by the window is not reflected by a bright ceiling and frieze, the shades on the faces of the people, as on all other objects, will appear black. In my opinion, white is the proper colour for a ceiling.

In modern times, when poverty and ignorance have walked hand-in-hand, an effort has been made by our manufacturers to provide the world with cheap art wherewith to cover its

walls; but a moment's consideration will convince any one that art and cheapness are incompatible, since the faculty to produce art is comparatively rare, and rare things are choice, not cheap.

It is true that in early times a great deal of art of the utmost value was done for nothing, or at least not paid for in coin of the realm: the notes then current, viz., promises to pay in a future state, were deemed more than equivalent. These works were done in endowed monasteries by artists who neither had nor wanted any property of their own. The finest hand decoration in the world was done by them on manuscripts. It is probable that equally good work could be done now, but it would have to be paid for as it was then, and, therefore, is wholly outside the region of practical commerce. We have no parallel institutions now, and our artists are glad to conspire with the manufacturers in the effort to provide cheap art for the masses; and it is now for me to show that, although they have had in one sense a tremendous success, inasmuch as they may be said to have covered every room in England, of rich and poor alike, with their wall decorations, their work in its present condition is rather a curse than a blessing; that its tendency is rather towards the degradation than the exaltation of taste, and leads to intellectual torpor.

Let me point out, first, that unity is one of the fundamental principles of all art. It has always been recognised as such. By artistic unity I mean that each of the parts of a design shall be necessary to the other parts, and that none shall be redundant. Two hands, for instance, are necessary to the completion of the figure of a man, but two right hands would be redundant. In a society composed of men and women of different capacities and different ages, each has a special function in supplementing the deficiencies of the others; but if all were made exactly alike or turned out in similar groups, human life in any high sense would be impossible—at all events, its graces and beauties would disappear.

You see, therefore, that artistic unity, a fundamental principle of good design, cannot be had in stamped or printed ornament, for its members must inevitably be repeated many times in one field of view. Now human sensibilities are capable of being quickened and developed, or, on the other hand, of being dulled and debased by what you offer for their contemplation. A series of ideas, or of forms, or of intervals of colour such as constitutes an artistic design, may be entirely delightful, but its frequent repetition without any relief will first weary, next disgust, and finally dull your sensibility and destroy your capacity for enjoyment of that kind. The effect in the first case is exalting, in the last depressing. Whatever quickens is good; whatever deadens is bad.

The walls of my own picture-gallery were decorated by one of the most esteemed London firms. The chief feature is a rose set in the undulations of a foliate pattern. The same rose appears about 500 times. Even if it were well drawn, and if your sensibilities remained awake enough to recognise the resemblance to nature, the effect would be to make you hate the smell of roses for the rest of your life. To familiarise the eye with the gross violations of vegetable physiology which are inevitable in a foliated pattern is, as I said before, to promote intellectual torpor; instead of being roused to indignation you sink into indifference. The result is that I take a vindictive pleasure in driving nails into the roses to hang pictures by, and am glad to obliterate the decoration.

The repetition of the shaft in a colonnade is not a case in point, because the shaft is a constructional, not a decorative, member, and its multiplication confirms the sense of security of the structure.

In those cases where a work of fine art is adapted to perfect reproduction by casting, let us say, sculpture, or engraved plates which can be reprinted indefinitely, its intrinsic value and its artistic importance are in no degree diminished by repetition, as each copy is isolated. Five hundred prints of the Raising of Lazarus are not usually hung in one room. If every town in England possessed a cast of the Theseus of Phidias the intrinsic value of that incomparable work would remain the same as it is now.

I do not despise decorative art produced in factories because it is cheap, but I broadly affirm, as a general principle, that it is not only valueless, but, strictly speaking, vicious; that to say its tendency is to dull the people's sensi-







Circle occupies the second tier with seven rows, and the twelve rows of the Gallery occupy the third tier.

A Vestibule and large "Foyer" behind an enclosing corridor, 6 ft. wide, are provided for visitors to the Stalls and Balcony Stalls, the latter being on a level with the street. Right and left of the main corridor are stairs leading down to the Stalls. On the first floor, in rear of the Upper Circle corridor, is the Grand Hall, 30 ft. long, 16 ft. wide, and 18 ft. high, which is intended as a lounge and refreshment-room, but which is specially adapted for concerts and entertainments on a small scale, when performances are not going on in the theatre. Arrangements have also been made by the proprietor for the supply of refreshments to the occupants of the Pit and Gallery, for whose accommodation bars, and refreshment and smoking rooms, are provided.

The scheme of colour of the auditorium is pale lemon, white, and gold, relieved with pale grey-blue. The hangings are gold and coral brocatelle. The seats are covered with Genoa velvet, carrying out the blue tone introduced into the decorations. The walls of the Dress Circle, Private Boxes, Second Circle, and Staircase, are covered with a gold-stamped leather paper. The frame of the Proscenium is of a brown and white alabaster, and the sides of the Stalls and Pit are lined with panelled walnut and gynaecore, with carved moldings, specially designed and manufactured in Germany.

The Grand Hall in the Second Circle is early French Renaissance of the Henry II. period, with geometrically ribbed ceiling and cornice, tapestried walls, panelled dado, doors, and fireplace. The colour is a turquoise-blue and green. The windows are filled with leaded glass, and the hangings are of silk brocatelle: the floor being an oak parquet, with an inlaid border of various woods.

The Vestibule, Crush Room, Stall Entrance, and passages outside the auditorium are decorated in Pompeian style; the Entrance Hall being red, the Crush Room blue, with tapestry hangings, and the Dress Circle corridor light in colour, with a cinnamon and golden dado.

The Royal Room is panelled on walls and ceiling with wood moldings, and carton-pierre in the Adams' style, the colours being blue, white, and platinum. The walls have Venetian mirrors in the centre of panels. The furniture is of mahogany, enamelled and decorated, the settees and chairs being covered with silk damask. The draperies and curtains are lemon colour.

The Stall Foyer and Smoking Room is an imitation of an early Dutch interior—the ceiling being supported by heavy beams, with panels in pitch-pine and plaster decorations. The high dado is entirely copper bronze, the upper part of the wall being covered with a very rich leather. The mantel is stone, surmounted by a heavy over-mantel, containing two old Dutch portraits.

The Iron Curtain dividing the Stage from the Auditorium has been painted by Mr. E. G. Banks, the painting representing the Old Iron Gates leading to the Avenue of Chestnuts at Bushey Park. The Drop Scene is from the brush of Mr. W. Telbin.

It has been decided to light the Theatre exclusively by electric light, and to have no gas at all in the building. The light is generated by machinery in adjacent premises belonging to the proprietor, and the electric current is conveyed to, and stored in, accumulators. The entire installation has been carried out under the direction of M. Emil Sechehaye, the Electrical Engineer of the Grand Opera and Hof-Burg Theatres, Vienna. The electroliers have been supplied by Messrs. Benham & Froud, Limited, Messrs. Shoolbred & Co., and Messrs. Hess, Wolff & Co., of Vienna. The whole of the Stage Electric Lighting arrangements are the patents of M. Sechehaye—all the fittings having been manufactured in Vienna.

A large organ for the stage is in course of construction; the manuals will be placed in the orchestra, and connected with the organ by pneumatic tubes.

The sanitary arrangements are described as being on an unusually complete scale, especial care having been taken to provide ample convenience in every part of the house. Lavatories, with hot and cold water supplies, are placed in the cloak-rooms; and in the Stall lavatory, provided for gentlemen, a dressing and bath room has been arranged for the convenience of visitors desiring to dress at the theatre. Especial regard has been paid to

ventilation, and the whole of the buildings are heated by hot water.

The following contractors have been engaged on the works:—Messrs. Stephens & Bastow, builders; Messrs. Morland & Son for the iron work; Messrs. Jackson & Son for the plaster ornamentation; Messrs. Campbell Smith & Co. for the whole of the decorations of the theatre, and the designs for the large foyers; Mr. R. Davison for the marble proscenium and mosaic floors throughout the theatre; Messrs. Clark, Bunnell, & Co. for the iron protected curtain, and hydraulic motors and machinery for the stage; Messrs. Merryweather & Sons for the fire hydrants; Mr. F. Beer for the hot-water apparatus and speaking-tubes; Messrs. Shoolbred for the furniture, seating, upholstery and drapery, and electric wiring, also the wood panelling in the stalls; Mr. Rhodes for the stage; the Electrical Power Storage Company for the accumulators; Messrs. J. G. Statter & Co. for the dynamos; Messrs. J. H. Andrews & Co., Stockport, for the engines; the Edison and Swan Lamp Company for lamps; Messrs. Woodhouse & Rawson for lamps and electric appliances; Messrs. E. L. Berry & Co. for the electric bells.

#### COMPETITIONS.

"The Hydro," *Buxton*.—As stated last week, the first premium was awarded to Mr. Dawes, Messrs. W. Sugden & Son obtained the second, and Mr. G. Statham, Matlock and Nottingham, the third. It is expected the first-named design will be carried out with modifications. In all, twenty-two sets of plans were sent in.

Thomas Walker Convalescent Hospital, near Sydney. — We learn from the *Australasian Builder and Contractors' News* that by the will of the late Thomas Walker, of Yarralla, Concord, N.S.W., the sum of 100,000l. was bequeathed for the erection and maintenance of a hospital for convalescents, and a peninsula of about 30 acres in extent, at Rocky Point, on the Sydney side of the Parramatta River and near Ryde township, was included in the bequest. The trustees decided to obtain competitive designs for laying out and erecting the proposed institution, and offered three premiums of 250l., 150l., and 100l. respectively. The adjudicators were Mr. Thomas Buckland, Mr. T. Rowe (nominated by the Institute of Architects of N.S.W.) and Dr. McKellar (nominated by Messrs. Buckland and Rowe). Designs were invited in March last, and the latest date for sending them in was advertised to be July 31, up to which latter date twenty-one sets of drawings had been received, some coming from New Zealand and some from Tasmania, and two sets were not delivered by the time specified in the conditions. The first premium has been awarded to the design bearing the motto "Pro Opere Beneficio," by Mr. J. Kirkpatrick, of Pitt-street, Sydney. The second premium went to the design bearing the motto "Comfort," by Mr. James Barnett, jun., of Castlereagh-street, Sydney. The third premium was adjudged to the design bearing the motto "Hospice," by Messrs. Wilshire & Shaw, Castlereagh-street, Sydney.

#### ARCHITECTURAL SOCIETIES.

Manchester Architectural Association. At the fourth ordinary meeting of this Association, held on Tuesday, at the Diocesan Buildings, Mr. A. H. Davies Colley, A.R.I.B.A., the President, in the chair, a discussion was opened by Mr. H. B. Bare, F.R.I.B.A., upon "Architects and Handicraftsmen." The foundation of a Chair of Architecture and the allied arts, such as sculpture and decorative painting, was suggested as very desirable at Owens College, Manchester, and other colleges of the Victoria University. The professor would direct a course of mental and adopt any work for those who afterwards might adopt any of the special branches of artistic professions or handicrafts. The result would be a sounder and wider education in arts, and a greater sympathy between all professions and all handicrafts, which must before long improve art of every kind. Messrs. Hodgson, Mould, Stelfox, Mee, and the chairman, took part in the discussion which followed.

The Sheffield Society of Architects and Surveyors.—An interesting lecture was delivered at the monthly meeting of this Society on the 11th inst., by Mr. H. W. Brewer, of London, on "The Smaller Mediaeval Municipal Buildings of Central Germany." Mr. Flockton (the President) presided, and there was a large attendance of

members, including Messrs. C. J. Innocent, J. B. Mitchell-Withers, C. Hadfield, E. M. Gibbs, W. F. Hemsoll, W. C. Fenton, H. W. Lockwood, W. H. Lancashire, C. F. Wyke, and others. The lecture was illustrated by a fine collection of unique pencil and water-colour drawings, over sixty in number, made by Mr. Brewer on the spot at different times; and these are enhanced in value from the fact of the disappearance of some of the buildings during the past few years through the rage for modern improvement. Mr. Brewer explained the origin and marvellous development of municipal institutions in Germany and the Low Countries during the middle ages. They suited the character and genius of the people, and were especially vigorous in the free towns, and those under the sway of the Prince-Bishops. Municipal life and character flourished throughout the German Fatherland at that period to an extent unknown elsewhere,—and in its free and bracing atmosphere, architecture and all the arts and crafts flourished. The lecturer proceeded to describe in detail the interesting Rathhouses or Municipal Halls of Würzburg, Münster, Hildesheim, Ratibon, and Prague; and those of a smaller and less known type, such as Rothenburg and Dettelbach. Referring to the latter, he pointed it out as an example of the ingenuity and inventiveness of the old architects, who generally turned difficulties to advantage. This building, so to speak, stood on no ground at all, being partly over a street and a river, and there were many such examples of the utilisation of difficult town sites which were invaluable to the architect of to-day. He alluded to the interesting Rathhaus of Ochsenfurth, where the Council Chamber has the original tables and furniture of carved pine wood, and a unique bronze pint or measure now in daily use, and dating from the fourteenth century. The President passed a high encomium on Mr. Brewer's drawings and research, and called upon Mr. C. Hadfield, who, in moving a vote of thanks, remarked that Mr. Brewer's drawings had the graceful touch, feeling, and accuracy of a Proust, and evidenced that the labours and researches of the lecturer had been a labour of love. The important question of new municipal buildings in Sheffield was within measurable distance, and he had every confidence that the municipal life and character of the town to-day would be able to produce happy results if only the work was undertaken in the common-sense, practical, and artistic spirit that characterised the buildings of the old German burghers. Mr. Hemsoll seconded, and a hearty vote of thanks was awarded to Mr. Brewer for his interesting paper. As we need hardly remind our readers, many of the buildings mentioned by Mr. Brewer in his paper have been illustrated in the *Builder* from his drawings.

Edinburgh Architectural Association.—The usual fortnightly meeting of this Association was held on the 18th inst. in the Architectural Hall, 42, George-street. Professor G. Baldwin Brown in the chair. After the usual preliminary business was disposed of, Mr. Archibald C. Elliott, D.Sc., assistant to the Professor of Engineering in the Edinburgh University, read a paper on "Recent Departures on Electrical Engineering." The subject of artificial lighting, he remarked, belonged to the utilitarian rather than to the artistic side of the architect's business, and in his vocabulary was one of a set of three—lighting, warming, and ventilating—none of which had, unfortunately, hitherto received from him all the attention which was justly its due. Restricting the scope of the paper to the recently developed systems of distribution at high pressure from main generating stations, Dr. Elliott hastily glanced at the history of the subject, which, he stated, might be said to commence with the lighting in 1884 of several of the stations on the Metropolitan Railway by the system of Messrs. Gaulard & Gibbs. Until then engineers had thought that there was no help for it but to let from 50 to 75 per cent of the prime cost of an installation be sunk in copper mains; but on the new system the electrical energy was transmitted through comparatively light mains at enormous pressure—from 1,000 to 10,000 volts.—and by means of "transformers," placed at convenient points, was delivered to householders at the quite harmless but useful pressure of 50 to 100 volts. Dr. Elliott then showed how, in the modern transformer, the usually intractable property of self-induction turned itself to good account, and was the means of rendering the apparatus almost perfectly self-regulating. The



efficiency of a transformer was rather difficult to measure; and that in some degree accounted for the distrust with which it was at one time regarded. The theory had, however, all along pointed to a high efficiency; and it might now be said with safety that the efficiency of a good transformer at full load was considerably over 90 per cent. In order to show the great advance which had been made, he had calculated the cost of a distributing main for 5,000 lamps, extending, say, from some distance west of St. Mary's Cathedral to somewhere beyond St. Andrew-square, to be, on the old parallel system, 14,000*l.*; the three-wire system, 10,500*l.*; and on the new high-pressure transformer system, 4,200*l.*; and, in addition to the saving in cost, the transformer system, he pointed out, had the advantage of a much more constant pressure in the mains. Mr. Ferranti, the engineer to the London Electric Supply Corporation, whose company at present worked the Grosvenor Gallery installation, had decided to use in the new Deptford installation, which would be, without exception, the largest in the world,—no less a pressure than 10,000 volts. The expansion would be carried out in two stages,—first, from 10,000 to 2,400 volts, and then from 2,400 down to 100 volts in the consumers' mains. On the advice of Sir William Thomson, Mr. Ferranti was going to use for the 10,000 volts mains a conductor of two concentric hollow copper tubes, separated by an insulating compound. The outer tube would be at the potential of the earth, so that although the main might be transmitting energy at the rate of 5,000 horse-power, it might be touched with impunity. Mr. Heaviside had shown that the copper near the axis of a conductor carrying alternating current was, owing to self-induction, much less effective than the outer part; and it would be interesting to see how far this conclusion was borne out practically at Deptford. Through the kindness of Mr. Ferranti, an actual 2,400 volt transformer and some other apparatus for the Deptford installation were exhibited to the meeting. At the close of his lecture, a hearty vote of thanks was accorded Dr. Elliott for his paper.

## OBITUARY.

Mr. Richard Redgrave, R.A. (retired), died on the 14th inst. at his residence, Kensington, after a short illness. According to "Men of the Time," he was born in Fimbo, April 30, 1804, and during his early youth he was employed under his father, William Redgrave, a manufacturer, who, says the *Times*, was working with Bramah, the inventor of the hydraulic press. Richard was employed in designing and in the drawing of specification work, and this employment seems to have acted upon his whole life. He had long supplemented his business work with sketching from nature, and when he, at the age of 21, entered the Royal Academy as a student, he supported himself by giving instruction in landscape drawing. MacIse was one of his contemporaries during his student life, and in a contest for the gold medal, MacIse was successful against Redgrave. For the next ten years very little is heard of him; but about the year 1836 he exhibited his first well-known work, "Gulliver on the Farmer's Table," at the British Institution. It was not till 1838 that a picture of his was hung on the line at the Academy, and it is stated the work—an illustration from one of Crabbe's poems—had been already rejected by the Institution. The picture was immediately sold, and from this time his success was assured. In 1839 he again exhibited at the Academy, and in 1840 he was elected an Associate. For several years he was a constant contributor to the annual collection at the Academy, and he by no means confined himself to landscape; and in 1851, when he produced his "Flight into Egypt," he was elected R.A. It was about this time that, with the help of Mr. H. Cole (afterwards Sir Henry Cole, K.C.B.), he formed the museum of ornamental art at Marlborough House, the nucleus of the present Museum of Art at South Kensington. Both the fellow-workers rendered service to the nation in the carrying out of the scheme of the Great Exhibition in 1851. Cole was one of the executive committee, while Redgrave was named one of the jurors in the Fine Art Section, and he further wrote a report on design applied to manufacture as shown in the exhibition. In 1855 the two were again employed together in representing Great Britain at the Paris Universal Exhibition. Cole was British Commissioner; to Redgrave were intrusted the

arrangements of the British Art Section, and here he drew up a report similar to the former one. For his services in this connexion Redgrave gained the Cross of the Legion of Honour. In 1858 the Queen appointed him Surveyor of Crown Pictures, and for many years he was engaged in preparing a catalogue of all pictures belonging to the Crown. In 1866 he joined his brother Samuel (who died in 1876) in preparing a history of British art from the time of Hogarth, under the title of "A Century of Painters." For many years he kept up his connexion with South Kensington, where he took the chief part in forming an historical collection of water-colours for the Museum. In 1880 he resigned both his appointment as Surveyor and Keeper of the Royal Pictures, and also his post in the Department of Science and Art at South Kensington, and from that time he seems to have painted but little. The funeral took place on Wednesday last at Brompton Cemetery. Mr. H. J. Paull.—The death was announced at the meeting of the Institute on Monday of Mr. Henry John Paull, F.R.I.B.A., of the firm of Paull & Bonella, and formerly of Manchester. He was elected a Fellow of the Institute in 1867.

WIDTH OF ROAD BORDERING A COMMON:  
A CURIOUS POINT RAISED.

At the Woolwich Police Court, Mr. C. H. Congdon, of No. 10, The Pavement, Lower-road, Charlton, builder, was summoned by the Metropolitan Board of Works for continuing penalties for not making a road leading out of the Chesham-road, Plumstead, of the statutory width of 40 ft., contrary to 25 & 26 Vic., c. 102, Vic. 98, and By-law.

Mr. Burton, solicitor, appeared for the Board, and Mr. Besley for the defendant.

The facts were as follows:—The defendant built twelve houses in a way only 27 ft. wide, leading out of the Chesham-road, and to give the statutory width it would be necessary to take in 13 ft. of Plumstead Common.

Mr. Besley, in defence, stated that the road was amply sufficient with its present width, as no houses could be built upon the other side, and called Col. Hughes, M.P., and Mr. Talfourd Hughes in support of this view.

Mr. Fewlick, the magistrate, stated that he found the way was "a new street," and subject to the provisions of the Act of Parliament and By-law, and he fined the defendant 10*s.* and 2*s.* costs.

## QUANTITIES AND SURVEYORS.

SIR,—In your issue of the 1st inst., you inserted an important paper read at a meeting of the Institute of Builders (at which I was present as a visitor), but no report was given of the interesting discussion which followed.\*

As this paper was, in the main, depreciatory of the status and capabilities of quantity surveyors, and has, hitherto, received no answer, I will ask you to insert this letter as a protest against, and a correction of, several statements made at the meeting.

1. It was asserted that no body existed to represent or guarantee the respectability and competence of surveyors. This remark must have been made in ignorance of the existence of the Surveyors' Institution, to which most surveyors of standing belong, and which has an entrance examination, with a special division for the mensuration of building work. This provides for the professional training of its Associates. Membership also guarantees respectability in various ways. Candidates have to be proposed and seconded by six Fellows and Associates, the applications being afterwards considered by the Council, and then voted on by a general meeting. Although cases of black-balling are not numerous, they are sufficient to prove the existence of the safeguard, and their scarcity is owing probably to the fact that undesirable persons are discreet enough not to court a defeat.

2. The author of the paper, and several speakers at this meeting, brought instances of ridiculously inadequate bills of quantities, both in description and dimensions, thereby inferring a general charge of incompetency against surveyors.

Such exceptional cases can be found, if searched for, in every trade and profession. The only protest against the general tone of depreciation was made by Mr. Chappell, the contractor, who was fair enough to admit that on the whole, builders have reason to be thank-

\* We have not space, of course, to report all the papers and discussions that take place.

ful to the skilful and honourable body of London surveyors.

3. As to the repeated assertions of exorbitant charges of 2*½* and even 5 per cent., these cases must be rare in London, and the more usual commissions of 1*½*, 1*¼*, and the frequently inadequate charge of 1 per cent. or less, was not set off against the instances of excess.

No notice was taken, either, of what I believe is the fact, that these excessive fees are generally charged in the unusual case of architects who take out their own quantities, and repudiate any responsibility.

No practical remedy was proposed for getting over the difficulties created by the late legal decisions on the liability for errors and payment of quantity surveyors, which, as I supposed, the meeting was called to discuss.

This question, however, is now about to come under the consideration of a joint committee of members of the Surveyors' Institution and the Institute of Builders, and may safely be left in their hands.

Builders are naturally disturbed at the decision in Priestley v. Stone, but insinuations are sometimes unjustly made that by this case surveyors have endeavoured to evade their responsibilities for errors, which, on the contrary, they have always acknowledged and frequently paid for. The abstract justice of this liability I do not intend to discuss now, but the defence went on different lines altogether, and does not justify such unfair insinuations.

Another question also in the present state of uncertainty is, do such insinuations tend to the advantage of any one concerned?

SIDNEY VIGERS.

18, Abingdon-street, Westminster,  
Dec. 17, 1888.

## UPHOLLAND CHURCH.

SIR,—In the last number of your journal (p. 434) the church of Upholland is spoken of as "probably the only church in England dedicated to St. Thomas à Becket." This is very far from being the case. The dedication to St. Thomas of Canterbury, popularly known as St. Thomas à Becket, let me say, by the way, that the archbishop's true name was simply Thomas Becket; there is no authority for the intrusive *a*,—is not so very infrequent in England. There are no fewer than sixty-four churches bearing his name—nineteen more than are dedicated to his namesake, St. Thomas the Apostle, who only has forty-five. Of these, seven are in the county of Lincoln, while in his own county of Kent there are only two dedications to the martyred archbishop. At Lincoln, the chapel on the High Bridge, long since destroyed, was dedicated to St. Thomas of Canterbury, as was the far larger and more stately chapel on London Bridge. After the canonisation of St. Thomas, it became the fashion to call freshly-founded churches after the new saint. I may instance the churches of Portsmouth, and of Newport, in the Isle of Wight. In other cases the dedication was altered to suit the reigning fashion, the name of St. Thomas being either substituted for the former dedication, or associated with it. At Abingdon, in Berkshire, the monastic church was dedicated to St. Mary, while the parish church, which formed part of it, was called after St. Thomas. At Newton Valence, in Hampshire, we also have the same two saints associated.

EDMUND VENABLES.

\* The statement was made on the authority of Mr. Champneys, the architect for the additions to the Church, who, we presumed, had some grounds for it, as he had recently been practically interested in a church dedicated to Becket.

## WARMING OF VILLAGE CHURCHES.

SIR, Referring to the letter of your correspondent, signed "Engineer," in your issue of the 15th inst., my name is mentioned in such a way as to be calculated to lead the uninitiated to consider my patent warm-air system of heating buildings to be less safe and healthy than his low-pressure system. Perhaps "Engineer" is not aware that I make low-pressure apparatus, but, for a lofty or very spacious building, I not only do not recommend it, but utterly repudiate it. A life's experience on matters pertaining to the heating of buildings has convinced me that to raise the temperature of a building that is lofty to 55 deg. Fahr. in frosty weather, innumerable pipes would have to be supplied, and even then the cold down-draughts would be unbearable. Those whose churches are heated on the low-pressure system can best testify to this, especially if the churches be spacious and lofty.

It has been my good fortune to warm thousands of buildings,—public and private,—and in no single instance have I known the premium to be advanced by the fire insurance companies. On the contrary, not only have most of the leading fire insurance companies complimented me on the safety of my scheme, but many have employed me to warm their offices in London and the provinces.



With regard to the purity of the method I employ as my speciality, take the fresh air from outside and convey it through earthenware tubes to the heating-chamber, which is constructed with bricks and covered with stone. In that brick chamber the warm air is generated, and from thence is conveyed, through brick channels, under the floor of the church, and admitted, pure and warm, through perforated gratings, which are placed flush with the floor. By this means an equable and agreeable temperature is obtained throughout the building, within two hours from the time the apparatus is in operation. JOHN GRUNDY.

#### LONGTON COTTAGE HOSPITAL COMPETITION.

Sir, Will you afford us space for protest against "another unsatisfactory competition?" The above named was limited, by special invitation, to some seven or eight local architects, amongst whom we had the misfortune to be included.

At the outset we obtained a conditional promise that an assessor should be appointed, or we should not have entered the competition.

In due course the secretary apprised us officially of the assessor's appointment, and in reply we wrote, expressing satisfaction that the trustees had adopted this course.

Later (Nov. 28th) he informed us: "The trustees have now decided upon two sets of drawings to select from—viz., Mr. Ford's and Mr. Taylor's." He added: "It only remains to say that your plans are at your disposal, and may be removed by you whenever it suits your convenience."

Now, from inquiries that have since been made, the following facts have been ascertained:—"1. The assessor never saw any of the designs sent in, except those of the two favoured competitors already named, the plans of the other invited competitors being virtually suppressed. 2. The two favoured competitors had access to view the whole of the designs before the assessor entered upon his duties; whilst, on the other hand, the unfavoured competitors (such as ourselves, Mr. Lynam, and all the rest), some of whom had asked for, or been promised, that privilege, were never allowed to see the designs at all. Comment appears needless.

Leek, Dec. 18, 1888.

W. SUGDEN & SON.

#### "THE NEW LAW COURTS BRANCH OF THE BANK OF ENGLAND."

Sir,—With reference to the description of this building, which appeared in your last issue, will you permit me the opportunity of stating, and thus correcting an impression calculated to mislead your readers, that the private offices and residential apartments throughout the Bank are warmed and ventilated by means of "The London Grate," an improved ventilating grate in terra-cotta, recently introduced and manufactured by me, which ensures a constant inflow of agreeably warmed fresh external air, while its extraction after use is provided for by the introduction of my "Air Chamber Smoke Flues," a continuous circulation and change of air being, by these means, maintained at all times without draught, and a large return secured from the great percentage of the heat which in ordinary fire-places passes wastefully away.

Stangate, Lambeth, Dec. 20.

GEORGE JENNINGS.

#### Spanish Exhibition in London, 1889.

We are informed that all matters have now been definitely settled for holding a Spanish Exhibition next year at Earl's Court, upon the site of the late Italian Exhibition, when the President will be the Duke of Wellington, Grandee of Spain, and the vice-President, Colonel G. T. North. The Industrial Section of the Exhibition will consist of a display of the various manufactures of Spain and her colonies, whereby the public will be enabled to form some idea of the latent resources of the Spanish peninsula. A special selection of paintings and sculpture by Spanish artists, and representative collections of articles from the chief centres of the Spanish industry, including laces, Cordova leather, Toledo steel, Damascus ware, &c., will be included. Many descriptions of products will also be on view, including the raw materials, food stuffs, minerals, &c.; and a great feature will be made of the costumes worn in the different provinces. Spanish streets, villages, and shops will be erected and peopled by the men and women from the different districts, in their picturesque dresses. There are even to be daily exhibitions of bull-fights,—but, we are told, "with one very strong point, viz., without the accompanying cruelty usually practised." How a bull-fight can be a bull-fight without cruelty we have yet to learn. It is anticipated by the promoters that the exhibition will be open to the public about the middle of April next.

## The Student's Column.

### ARTIFICIAL STONES.—XXV.

Methods of Indurating Artificial Stone by Exposure to Gases (continued).

NICHOLLS and MILLAR'S decorative compound, patented in 1885, is formed of a mixture of powdered brick-dust, pumice, slag-wool, and Portland cement, moistened in solution of chloride of magnesium (or bitterne water), carbonates of soda and ammonia and caustic soda. The caustic soda and carbonate would cause the formation of a portion of hydrate and carbonate of magnesium, which, uniting with undecomposed chloride, would form the desired oxychloride. The addition here of an ammonium salt seems at first sight of doubtful utility, as such compounds tend to prevent the precipitation of magnesium compounds, yet it may in virtue of this very property be useful in preventing the too rapid setting of the mixture, and owing to its volatile character, its expulsion, and the removal of its retarding influence, would only be a matter of time and temperature. To impart strength and flexibility to the compound, the inventors mould it on wire or perforated metal-work, or incorporate it with tow. In some cases the soluble silicate and chloride of calcium treatment is applied, and the stone finally washed with a solution of bichromate of potash.

Erdmenger states that magnesia calcined at a low temperature possesses the property when added to Portland cement of resisting the influence of the salts of sea-water. The temperature of calcination has an important practical bearing upon this matter, for M. Lechartier has pointed out\* that magnesia calcined at a high temperature has a most evil effect upon the durability of Portland cement, in consequence of its peculiar property, first noticed by St. Clair Deville, of uniting with water to form a hard hydrate, an increase of volume at the same time taking place; this hydration, in the case of over-calcined magnesia, only takes place after a prolonged contact with water, so that in some cases investigated by Lechartier (the cement having been made from dolomitic marl, and which seemed to set very hard, and to be in all respects most satisfactory), in a year or two disruption of the cement and destruction of buildings in which it had been employed showed the practical effect of a neglect of Deville's observation.

The indurating effect of ammonium salts is disputed by some, but they are nevertheless used by several patentees in artificial stone mixtures. Bodmer and Wilson in 1862 prepared artificial stone by adding to various mixtures of stones, cements, sand, &c., solutions of sal ammoniac or other ammonium salts.

In O'Neill's patent (1881, pat. 5,033) the stone is made from equal parts of Portland or blue lias cement, cinders or coke-dust, and powdered marble mixed with water containing one per cent. of borax; the mixture may be run into moulds, allowed to set for twenty-four hours, rubbed down with sand-paper and coloured or enamelled by usual processes.

Barium salts are often useful additions to stone-forming cements, and Meyn and Armack in their patent (1885, pat. 13,595) employ them. In carrying out their invention very fine cement is mixed with baryta: if a variegated marble or stone is to be formed, separate portions of the cement are mixed with appropriate colours and formed into stiff paste with water, then suitable pieces are kneaded up with dry cement, which naturally adheres to the wet lumps and imbeds them. The articles are shaped when sufficiently dry and hard, polished by grinding and application of lime water and water glass, and finished off with putty powder, tripoli, &c.

In the artificial stones patented by J. Potter in 1864, the well-known binding power of sesquioxide of iron is utilised; iron filings being added to sand and mixed with water containing either chloride of ammonium or common salt in solution. The iron, in these circumstances, rapidly undergoes oxidation, and the desired cementation takes place.

A material known as "Metallic Cement," which produces a dark stone-like mass, is formed by adding iron filings to blue lias lime.

A stone introduced in Belgium for paving purposes was formed by placing small and well-

dried stones in moulds and then running in either molten iron or lead to bind them in one mass; the great weight and cost of the product, even if the agglomeration of the small stone were satisfactory, render the invention of little practical value.

### RECENT PATENTS.

#### ABSTRACTS OF SPECIFICATIONS.

494, Fireproofing Mills and Buildings. J. Hilton.

This invention relates principally to fireproofing existing mills, which are built with wooden beams and joists. To these parts of structure wrought-iron casings are fixed, and secured to the beams and pillars by brackets, or such-like fixtures. H or T iron joists are placed from beam to beam, or from wall to wall, and secured by bolts. Between these joists concrete is fixed, bricks or slabs being specially made to suit the spaces, and then the whole is plastered over, thus preventing any direct action of the fire thereon. This method will (it is claimed) only diminish the height of the rooms by about 5 in., and by fireproofing the underside of the roof in the same way, the rooms are kept at a more even temperature, and the expense of insuring the building and machinery will thereby be greatly reduced.

495, Roofing Felt. S. & T. Cooper.

For this purpose "Wood Wool" or "Wood Straw" is used, in which the length of the staple has been reduced by the aid of special machinery. The product is treated in the same way as fibrous materials, being mixed with tar or compound. The cost is lessened, while the material is quite as effective as roofing felt made in the ordinary way.

559, Supporting Sliding Windows. H. A. Ivatt.

According to this invention, a rail or flap is kept in a vertical position by a spring, but when it is desired to support the sliding window it is pushed forward so as to engage with recesses in the window-frame; or when the window is lifted entirely above it, it may be placed horizontally, and on the window being lowered down upon it, the rail will support the window.

4,012, Sash-fastener. T. Dykes.

The subject of this invention is a locking-fastener, the chief feature of which is a kind of handle hinged to the fastener bar. This handle serves the purpose of (1) a convenient part for grasping in operating the fastener, (2) a means of automatically locking the fastener, and (3) a device for guiding the window-blind past the meeting-rail of the sashes.

4,493, Chimney-cowls. J. W. & A. L. Sizer.

In the funnel of an ordinary lobster-back cowl, vanes are, according to this invention, disposed around the spindle on which the cowl revolves, and a short nozzle extending laterally from the back of the cowl directs the wind on these vanes, which, then revolving, assist the up-draught.

8,542, Raising Girders. G. Anderson (of Madras).

According to this invention, instead of derricks or scaffolding upon the tops, say, of bridge-piers, a vertical superstructure is constructed, from the top of which project, at right angles with the line of the bridge, two cantilevers, one on each side, for the actual lifting screw or hydraulic jacks and lifting rods are employed. The girders are floated out to or put together at the foot of the piers, one above the other below stream. Two bars are fixed to the end of the girder, so as to form with it a triangle. During the lift the upper of the two bars will be in compression and the lower in tension, the junction being the point at which the lifting-rod is connected. As both girders are lifted at the same time there is no lateral strain on the superstructure.

10,801, Sanitary Traps. G. H. Garrett.

In order that the water-seal may not be broken by a sudden rush of water carrying all the water from the bend, a branch-pipe or chamber (only open at the end connected with the trap), is, according to this invention, fixed near the dip or bend. The action is then, when the rush of the fluid syphons the bend, the branch chamber is left full, the reserve immediately flowing through the opening and re-charging and re-sealing the trap.

#### NEW APPLICATIONS FOR PATENTS.

Dec. 7.—17,879, H. Watts, Water-closet Seat Protective Covering, &c.

Dec. 8.—17,949, R. Hudson, Metallic Furniture for Gates or Doors.—17,959, J. Williamson, Self-attaching Door-chain.—17,970, W. Lindsay, Window-sashes.

Dec. 10.—17,980, W. Balmforth, Securing Door-knobs, &c., to Spindles.—17,991, J. & A. Duckett, Water-closets.

Dec. 11.—18,038, J. Strachan & J. Alcliff, Securing Sash-lines to Sashes.—18,049, J. Gibson & W. Glazier, Step-ladders, &c.—18,070, T. Aldridge, Chimney-pot and Ventilator.—18,073, J. Ferguson, Fireproof Ventilating Hearth.

\* Compt. Rend., vol. 102, p. 1,223.



Dec. 13.—18,185, H. Heaton & W. Knight, Chimney-pots.—15,285, C. Roe, Fire-grates.

#### PROVISIONAL SPECIFICATIONS ACCEPTED.

14,665, W. Cottam, Flushing Water-closets.—14,743, J. Martin, Draught and Dust Excluder for Windows.—15,420, F. Lamcraft, Windows and Window-fastenings.—15,421, W. Hucks, Washing and Sifting Sand, &c., for Building Purposes.—15,541, C. Hennam, Bits or Fastenings for Doors.—15,543, E. Newton, Horticultural Buildings, &c.—15,568, W. Smith, Wood-planing Machines.—16,113, P. Evans, Cement.—16,131, A. McKechnie, Stone-dressing Tool.—16,169, F. Abbey & A. Walshaw, Chimney Pot.—16,234, J. James, Calculating Combs, Materials, &c.—16,354, R. Taylor, Concrete-mixing Machine, &c.—16,789, R. Jackson, Securing Cords to Sash-windows.—16,940, W. Bendall, Paint Brushes.—17,415, A. Katz, Building Blocks.

#### COMPLETE SPECIFICATIONS ACCEPTED.

##### Open to Opposition for Two Months.

17,326, J. Hill, Opening and Closing Fanlights and Skylights.—284, M. Adams, Floor Tiles.—1,295, R. Harrison, Opening, Closing, and Adjusting Fanlights, &c.—1,394, C. Heaton, Ornamental Work for Walls, &c.—1,587, K. Garbe and K. Ross, Attaching Door-knobs, &c., to Spindles.—2,131, H. Wiers, Window-work and Pier Seats.—2,272, J. Bassett & F. Seyde, Fireproof Ceilings and Partitions.—2,815, M. Pawcett, Fireproof Floors.—7,211, I. Hawkins, Construction of Sewers.—16,272, B. Holbrook, Ventilators.

#### RECENT SALES OF PROPERTY.

##### ESTATE EXCHANGE REPORT.

Dec. 10.

By J. P. HOPE.  
Acton—2 and 3, Burlington new, 88 years, ground-rent, £8. 6s. 2550

By EASTMAN BROS.  
Islington, Byron-road—Five plots of freehold land 75

Dec. 11.

By B. BROWN.  
Old Ford-road—No. 386, Freehold..... 970  
Victoria Dock-road—No. 147, term 99 years, ground-rent, £8. 6s. 610

By REYNOLDS & EASON.  
Clapton—183, Glensarm-road, and 8, 8 to 11, Clarke's terrace, 38 years, ground-rent, £30. 870  
Dalston—155, Queen's-road, 31 years, ground-rent, £8. 255

Dec. 12.

By F. HARDS.  
New Woodrow—The freehold licensed beerhouse in Hamilton-road..... 775  
Deptford—4, Crossfield-lane, freehold..... 108  
New Cross—63, Railway-grove, 67 years, ground-rent, £3. 10s. 125  
Blackheath—37, Tranquil-valle, 70 years, ground-rent, £45. 225

By DEBENHAM, TEWSON, & CO.  
Notting Hill, Pottery-lane—Freehold land, &c. 7p. 8,500  
Hackney—211, Richmond-road, 78 years, ground-rent, £7. 350  
213 to 221 odd, Richmond-road, 78 years, ground-rent, £7. 2,150  
1 to 4, Gladstone-buildings, 97 years, ground-rent, £36. 10s. 1,810

By J. H. HURPER.  
Rotherhithe—19, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

By C. W. MILLAR.  
St. John's Wood—23, Wellington-road, 32 years, ground-rent £3. 8s. 400

Holloway—65, Corwallis-road, 68 years, ground-rent £5. 195  
111, Marlborough-road, 68 years, ground-rent £8. 325  
30, Sussex-road, 61 years, ground-rent £5. 5s. 320  
35, Gratton-road, 61 years, ground-rent £3. 6s. 230

By HOBSON, RICHARDS, & CO.  
Chelsea—25, Tetcott-road, 94 years, ground-rent £6. 16s. 260

By H. N. NEWTON & CO.  
Regent-street—4, King's Arms-yard, 3 years, no ground-rent 85

Hampstead-road—17, Robert street, 33 years, ground-rent £2. 630

St. John's Wood—70, Abbey-road, 40 years, ground-rent £17. 860

Finbury—5 and 6, Clifton-place, freehold..... 900

Hampstead-road—17, Robert street, 33 years, ground-rent £2. 630

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Finbury—5 and 6, Clifton-place, freehold..... 900

Hampstead-road—17, Robert street, 33 years, ground-rent £2. 630

Spitalfields 10 and 11, Great Pearl-street, and 7, 8, and 9, Little Pearl-street, freehold..... 1,000  
29, Great Pearl-street, "The Prince of Wales" beer-house, freehold..... 620  
Bow-road—7, Coborn-street, 28 years, ground-rent £2. 430

Dec. 13.

By NEWSON & HARDING.  
Haymarket—1 and 2, Archer-street, and 18 and 19, Great Windmill-street, freehold..... 10,000

Battersea—19 and 21, Ingrave-street, 68 years, ground-rent £10. 4s. 500

20 and 23, Ingrave street, and a cottage, 63 years, no ground-rent..... 905

123, Plough-road, 91 years, ground-rent £7. 10s. 225

Finbury-park—31, Florence-road, 90 years, ground-rent £7. 350

Islington, Fickering-street—A plot of freehold land..... 110

By F. J. BISLEY.

Rotherhithe—109, Albion-street, freehold..... 150

By E. SIMMONS.

Brixton—11 to 17 odd, Poplar Walk-road, 78 years, ground-rent £18. 855

Peckham—39 and 41, Burchell road, 78 years, ground-rent £8. 10s. 358

Comenich-road, E 83, Sutton-street, 10 years, ground-rent £4. 10s. 120

89, 91, and 93, Grosvenor-street, 5 years, ground-rent £7. 960

Poplar 23 and 25, North-street, and 1 to 6, Speeding-gardens, copyhold..... 120

By WOSEFOLD & HAYWARD (at Dover).

Dover—79, Bigden-street, freehold..... 920

10, Albert-road, 77 years, ground-rent £2. 12s. 355

Charlton, Edred-road—Freehold house and stabling. A plot of freehold land..... 440

Dec. 14.

By C. & H. WHITE.

Walworth—19 Arthur-street, 44 years, ground-rent £3. 250

6 and 8, Arthur-street, 44 years, ground-rent..... 600

Forest Hill—1 to 9 odd, Ewart-road; and a plot of land, freehold..... 640

By J. REVILL.

East Mouley, Manor-road—Ordinance Lodge, freehold..... 458

#### Miscellaneous.

**West London School of Art.**—The annual distribution of prizes in connexion with this school took place on Friday, the 14th inst., at the school in Great Titchfield-street. Mr. G. A. Thrupp, Chairman of the Committee, presided, supported by Mr. Seymour Lucas, A.R.A., and Mr. G. A. Storey, A.R.A. In distributing the prizes, Mr. Seymour Lucas highly commended the work of the students, which he considered of much greater merit than that usually done at such schools, and he also bore eloquent testimony to the ability, earnestness, and experience of Mr. John Parker, the new head master, as a teacher. Mr. Storey read an interesting paper on "Mosaicism," tracing in all his works evidences of a close and ardent study of nature. The Committee have recently engaged Mr. John Parker, R.W.S., as head master, and other changes have been made in the teaching staff, which will increase the future efficiency of the school. Separate life classes are now opened for male and female students, and a special class for flower painting from nature has been formed under the direction of Miss Louisa Aumonier (a frequent exhibitor at the Institute, Dudley, and other galleries), while the class for design is ably conducted by Mr. M. Coulson. The "Mence Smith" Travelling Studentship (given for "colour decoration" by a member of the Painter-Stainers' Company, and open to all the schools of art in London) was taken by Mr. James West; and Messrs. Wm. Woodlams & Co.'s annual prize for the best design for a wall-paper was awarded to Miss Amy Woodall.

**Alloa Town-hall.**—On the 14th inst., the inhabitants of Alloa were formally presented with a town-hall and public library. For the munificent gift, which is of the estimated value of 30,000l., they are solely indebted to a native of the town, Mr. John Thomson Paton. The building is erected on a site in Marshall, at the south-east corner of Glebe-terrace, not far from the Sheriff Court-House. Mr. Thomson Paton employed Mr. Alfred Waterhouse, R.A., London, architect, and under his direction a structure has been erected which (according to the *Glasgow Herald*), while it is picturesque, so far as its exterior is concerned, is commodious and attractive inside. The style of architecture is a very broad treatment of domestic Gothic. The building consists of two portions, one four stories in height, and covering nearly the whole width of the site towards Church-street, and the other two stories in height, extending backwards at right angles from the front portion. The library, reading, and recreation and class rooms are to the front, while the Town-hall occupies the whole back portion. The central block of the front part projects beyond the general building line.

#### Unremunerative Property in Glasgow.

—On Monday evening, Mr. James Chalmers, architect, delivered an address entitled "Some Considerations Affecting Unremunerative Property in Glasgow," to the members of the Architectural Section of the Glasgow Philosophical Society. Mr. James Thomson, President of the Section, occupied the chair. Whether a property was remunerative or unremunerative depended, Mr. Chalmers said, on the return or the rate of interest it yielded on the money invested. The Glasgow City Improvement Trust, in order to save a certain loss, combined with the pleasure of providing a few houses for the poor, were willing to consider a small interest as an ample recompense for their expenditure. But a distinction must be made between business and philanthropy. Property was remunerative or otherwise according as it returned an adequate or inadequate interest. Mr. Honeyman thought 5 per cent. a fair interest on the housing of the poor, and others considered 4 per cent. sufficient, holding that plenty of capital would be forthcoming at that rate. When it was believed that property was the investment of the future, speculators rushed into building operations, with the result that the supply exceeded the demand, and the investment became an unremunerative one. That was the case at the time of the building mania, twelve or fifteen years ago, the result of which was that the public had no confidence in property as an investment. If property were bought when at its cheapest, and the investor could afford to hold it, he was sure to gain; but if bought at its dearest he was sure to lose, unless he could hold until another inflated time came. Regarding the houses inhabited by the poor, Mr. Chalmers said that if they were not remunerative it was because these slums had changed hands at an inflated value, and the present holders must be taking extraordinary means to retain a sufficient interest on this value. He thought that after allowing for taxes, repairs, and depreciation, the risk in this class of property should be amply covered by a return of 4 per cent. Referring to the tenements erected by the Improvement Trust in Stenmark, he said it seemed to be admitted on all hands that they were not dwellings for the poor. The rent the poor could afford was 7s. 6d. to 10s. per month, and as the rent charged was more than that, they were valueless to the poor. He thought property was taxed too highly, and that all real property, or actual income, should be taxed as well as property. At the close of the paper a short discussion took place, the speakers being Mr. A. Lindsay Miller, Secretary of the Section, and the President; and the author of the paper was awarded the best thanks of the meeting. There was a large attendance. At the next meeting of the Section Mr. Henry Dyer, M.A., B.Sc., C.E., late Principal of the Imperial Engineering College of Japan, will read a paper on "The Training of Architects."

**Some New Periodicals.**—The Christmas numbers of the *Boys' Own Paper* and the *Girls' Own Paper* form excellent supplements to those admirable magazines for boys and girls. They are published for sixpence each, at the office of the *Leisure Hour*, 56, Paternoster-row. The last-named periodical commences a new volume with the January number, which contains the first of a series of articles by Mr. W. J. Hardy, F.S.A., on "The Handwriting of our Kings and Queens," with *fac-similes*. The *Sunday at Home*, published at the same office, also commences a new volume with the New Year.—"The New Popular Educator" (London: Cassell & Co.) is a new re-issue of Messrs. Cassell's "Popular Educator," which has been almost entirely rewritten and re-arranged, and brought up to the level of modern requirements. New illustrations, new maps, new type, and the re-arrangement of the pages in a more convenient form than hitherto, are all features likely to render this important educational work increasingly useful and more "popular" than ever.

**The Sanitary Institute.**—At a meeting of the Council, held on Wednesday, December 12, Sir Douglas Galton, K.C.B., F.R.S., in the chair, it was decided to hold three examinations next year,—one for Surveyors in July, and two for Inspectors of Nuisances in May and November. Special courses of lectures and demonstrations for sanitary officers were decided upon, and a course of lectures on Domestic Hygiene for Ladies to be given in Lent. Fifty-nine Members and Associates were added to the register, and forty-three applications read for election at the next meeting.



**The Athens Exhibition.**—An Athens correspondent writes:—The exhibition here, which was opened on the occasion of King George's Jubilee, is due to the exertions of two merchants, the brothers Evangelos and Constantinos Zappos, both of whom are well known for their philanthropy. The exhibition building, which is surrounded by a park, and for which the Royal Gardens serve as background, stands by the Olympian Zeus Temple at the foot of the Acropolis. The building contains twenty large rooms, in which the various exhibits have been arranged with great taste. In the first section are found collections of ores and metals by the Greek and French mining companies at Laurion, and models and drawings of the machinery and plant used in cutting the Isthmus of Corinth. The second section contains specimens of all minerals found in Greece, among which the various samples of marbles attract particular notice. The third section contains a collection of woollen and silk fabrics, Oriental carpets, portières, curtains, &c. In one of the other sections are samples of work of the pupils at the Polytechnic School at Metsovo, consisting of maps, models, and drawings; further, for the exhibits of the first Greek stearine candle-factory at Korkyra, and the collection of furniture, the latter showing a curious blending of Paris imitations and Oriental originals. Next follows the sections representing the Greek wine, agriculture, cotton, tobacco, and engineering industries. Finally, there is a fine art collection, containing many splendid paintings and pieces of sculpture. The whole exhibition is a significant demonstration of the remarkable progress made by Greek industry during the last twenty-five years.

**The English Iron Trade.**—The approach of the Christmas holidays is having a quieting effect upon the English iron market, which, however, on the whole, remains pretty steady, and in some branches shows a rising tendency, in anticipation of a brisker trade in the New Year, which is confidently expected by those best able to judge. Pig-iron has been somewhat weaker this week,—in the North of England at least. Although the Glasgow warrant market has shown little animation, and quotations have been gradually going down, Scotch makers' prices are stiff. Middlesbrough pig is 3d. a ton lower,—at 33s. 9d. Mixed numbers of north-west hematites have declined 4d., and are now 44s. 8d. Values of pig-iron in Lancashire and Staffordshire are firm. There is very little change either in the finished iron and steel trades, both as regards the tendency of the market and prices. The tone is strong, and rates have an upward tendency. Common bars are 2s. 6d. a ton higher. Tin-plates are quieter, but large shipments are being made. Shipbuilders continue to book orders, thus making up for the tonnage launched. Activity is being maintained in the engineering trade.—*Iron.*

**The National Standard Theatre again in the Auction Mart.**—It is only two months since this theatre was offered for sale at the auction mart under the will of the late Mr. John Douglass, when it was withdrawn in consequence of the biddings not having come up to the reserve. On Monday last it was again submitted to competition, the auctioneer being Sir J. W. Ellis, as on the former occasion. Sir J. W. Ellis, in submitting the property, pointed out that, as a freehold estate, covering an area of 17,100 ft., the site alone, at the lowest estimate, was worth not less than £30,000. The biddings commenced by an offer of £20,000, two advances only on this sum being made, when the bidding stood at £21,000, which was the highest offer, being £10,000 less than was bid for the property so recently as October last. In again withdrawing it, the auctioneer said it was considerably below the moderate reserve which had been fixed.

**The New Government Buildings in Christiania.**—The jury adjudging upon the designs sent in for the new Government buildings at Christiania have now decided upon the programme for the final competition. Five designs have been selected, the architects being anonymous, and they will have nine months in which to prepare the final designs according to the suggestions contained in the programme, and will each receive a fee of 120l. In addition, the successful competitor receives 160l. for his design.

**Removal.**—Messrs. John Knowles & Co. give notice that on January 1, 1889, their head offices will be removed to larger premises at 38, King's-road, St. Pancras, N.W., adjoining their new dépôt, Star Wharf, on Regent's Canal.

**The Liverpool Engineering Society** held its fortnightly meeting on the 12th inst., at the Royal Institution, Colquitt-street, Liverpool, the President, Mr. C. H. Darbishire, Assoc.-M.Inst. C.E., being in the chair. A paper entitled "The Supply of Salt Water to the Public Baths, Bootle," was read by Mr. W. M. Blair, Assoc.-M.Inst.C.E., Surveyor to the Corporation of Bootle, who described the details of pipeline, pumping, machinery, and filter-tanks. The engine and pumps are placed about a quarter of a mile from the Brocklebank Dock, from which the water is drawn through a 9 in. pipe and forced up to the baths, which are about 80 ft. above the Dock. The water is also used for street watering purposes, for which hydrants are provided at suitable intervals. The filter-tanks are constructed entirely of wrought-iron, the main framing being of rolled joists spaced about 4 ft. apart. The filtering material, consisting of broken stone, gravel, and sand to the depth of about 3 ft. 6 in., is placed on a floor of gratings about 7 ft. above the bottom of the tanks. The water from the pumps is delivered at the top of the tanks, and, after being filtered, is retained in the space below until required in the baths. The total capacity of the tanks is about 150,000 gallons, and the contents of the two swimming-baths 100,000 gallons and 45,000 gallons, the water being changed three times weekly in summer. The Corporation of Bootle have decided to extend the salt water mains through the principal streets of the borough for street watering, as the cost of the water is only 2½d. per 1,000 gallons, this price covering all working expenses and repayment of capital. Several drawings were exhibited showing the construction of the filter tanks and machinery, &c. There was an interesting discussion, and Mr. Blair was thanked for his paper.

**A New Recreation Ground at Notting-hill.**—What has for many years past been known as the Tile and Pottery Works at Portland-road, Notting-hill, is about to be converted into an open space and recreation ground for the benefit of the residents in the locality. The land, which is freehold, occupying an area of four acres, was last week offered for sale by Messrs. Debenham, Tewson, & Co., at the Auction Mart, when it was sold for 8,500l., being at the rate of upwards of 2,000l. an acre. This is the highest price which has been obtained for freehold land in the neighbourhood of Notting-hill for some years past, but it now appears that the unusually high price which it commanded was owing in a great measure to a desire on the part of several influential gentlemen in the locality to prevent it being covered with buildings of the jerry class, which was threatened. Since the sale it has been resold to a committee of gentlemen resident in the district, who have purchased it for the purpose of laying it out as a recreation ground for the use of the public.

**Improved Window Fittings.**—We have a model and specification, by Mr. George Evans, for facilitating the cleaning of the outside face of sash-windows, in which each sash, as required, is pulled inwards towards the room by the upper rail, the sash turning on two small flush bolts in the bottom rail, which, when shot, act as pivot hinges; the beads are hinged to open inwards. Youton's "Accident-prevention Window Fitting," a rather more recent patent, is worked in a somewhat similar manner, but with the important difference that the bottom rail is pulled inwards, the top rail being kept in its place by a simple contrivance, and the sash being still suspended to the lines and weights, a method which, in the case of a heavy plate-glass window, throws less strain on the sash. The beads in this case are also hinged. An inspection of the model shows that it is a very cheap and workmanlike method, easily made, and capable of ready adaptation to existing windows.

**Sanitary Engineering at Edinburgh University.**—At a meeting of the Edinburgh University Court, held on Monday, on consideration of a minute of Senatus, the Court approved of the opening by the Professor of Engineering of a class on Sanitary Engineering in connexion with graduation in Science in the department of Public Health.

**Landing in England of the Prince of Orange.**—The Brixham Committee for celebrating the bi-centenary of this event met on Wednesday, and decided to entrust the commission for the statue to Messrs. W. & T. Wills, Sculptors, London. The statue will be in marble, 8 ft. in height, on a grey granite pedestal 10 ft. in height.

**Peruvian Railways.**—At a meeting of the Civil and Mechanical Engineers' Society, held on Wednesday evening at the Westminster Palace Hotel, a paper was read on the Oroya Railway, Peru, by Mr. W. Alfred Eckerlesley. The author, in commencing, chiefly attended to recent Peruvian history, and the way in which during unnatural inflation money was borrowed in the most reckless manner for railways and other public works which were only half executed when such a series of national reverses and disasters ensued as to almost paralyse the commerce and trade of the country. The natural resources of Peru, however, are so great that the author expressed the greatest confidence in the future prosperity of that country. Proceeding to describe the Oroya Railway, he stated that the line was now open to Chila—a distance of 87 miles from Callao, but until completed to Oroya, a further distance of 50 miles, the object of the line and the development of the rich mineral and productive districts of the interior would not be accomplished. The present terminus is over 12,000 ft. above sea-level, and is gained by an uninterrupted series of ascending gradients, the steepest being 1 in 25. The sharpest curve allowed is 6 chains radius, but in several places single and double bank shunts have been found necessary. The river Rimac and numerous gorges are crossed by viaducts of the American pin truss description, the spans varying from 91 ft. to 205 ft., and resting upon lofty but spidery-looking iron piers, sometimes over 250 ft. high, and the author seemed much impressed with the suitability of this description of ironwork for such situations, and considered it far superior to riveted structures. In making the surveys for the line, and also in constructing the viaduct, men and materials were slung along ropes across the lofty chasm, and much courage and energy must have been displayed; one of the largest of these examples of engineering skill having been erected in four months. The author tested the viaducts with heavy rolling and stationary loads, and found them to be very satisfactory, the deflection at the centre being generally less than 1 in 2,000, and the recovery perfect.

**All Saints' Church, Northampton.**—This well-known "Wren" church was re-opened on the 13th inst., after being closed several months for restoration. Outside nothing has been done beyond small necessary repairs. In the interior, the leading features of the church have been jealously preserved. The principal alteration is in the chancel. Here the east window has been blocked up on the inside, and a new reredos erected. Corinthian columns and pilasters, resting on a double pedestal, have been introduced. The centre compartment, with a semi-circular arched head, contains a painting of the Crucifixion, by Messrs. Heaton, Butler, & Bayne, of London. The carving is by Mr. Harry Hems, of Exeter. Formerly the entrance into the chancel was bald and meagre in the extreme. This has been remedied by the introduction of coupled Ionic three-quarter columns, supporting an enriched semi-elliptic arch, with large pilasters facing the nave, corresponding with the stone columns which carry the roof of the church and the central dome. The chancel possesses an exceedingly rich ceiling of modelled plaster work of the true Wren type, and to harmonise with this the walls have been covered with ornamental plaster work, executed by Messrs. George Jackson & Sons, of London. A new pedestal in oak, of appropriate design, supports the pulpit, (which, by the bye, contains some very characteristic carving), and takes the place of a modern paneled base. Among minor alterations may be mentioned a new metal corona lighting the centre of the church, manufactured by Messrs. Winfield, of Birmingham, and a new sunlight in the chancel, by Messrs. Stode & Co. The walls and ceilings have been coloured with light and warm tints. The whole of the works, costing about £2,500, have been executed from the designs, and under the superintendence, of Mr. Edmund Law, F.R.I.B.A., Northampton. The contractors for the interior work were Messrs. Smith Brothers, and for the outside restoration Mr. W. Beardmore.

**New Athenæum Club.**—The first of a series of dinners was held at the New Athenæum Club on Wednesday, December 12, Major Flower presiding. Mr. H. L. Florence congratulated the members upon the position of the club, and said he was of opinion that this dinner, the first given since the incorporation of the United Arts Club with the New Athenæum, augured well for the continued success of the club.



## PRICES CURRENT OF MATERIALS.

| TIMBER.                                   |           | £. | s. | d. | £. | s. | d. |
|-------------------------------------------|-----------|----|----|----|----|----|----|
| Greenheart, B.G.                          | ton       | 6  | 10 | 0  | 7  | 10 | 0  |
| Teak, B.L.                                | load      | 9  | 0  | 0  | 14 | 0  | 0  |
| Sequoia, U.S.                             | foot cube | 0  | 2  | 0  | 0  | 3  | 0  |
| Asb. Canada                               | load      | 3  | 10 | 0  | 5  | 0  | 0  |
| Birch                                     | 3         | 10 | 0  | 6  | 0  | 0  | 0  |
| Elm                                       | 4         | 0  | 0  | 5  | 0  | 0  | 0  |
| Fir, Danisic, &c.                         | 2         | 0  | 0  | 4  | 0  | 0  | 0  |
| Oak                                       | 2         | 0  | 0  | 4  | 10 | 0  | 0  |
| Canada                                    | 5         | 10 | 0  | 7  | 0  | 0  | 0  |
| Pine, Canada red                          | 3         | 5  | 0  | 4  | 0  | 0  | 0  |
| " yellow                                  | 3         | 10 | 0  | 5  | 10 | 0  | 0  |
| Lath, Danisic                             | 4         | 10 | 0  | 5  | 10 | 0  | 0  |
| St. Petersburg                            | 5         | 0  | 0  | 6  | 10 | 0  | 0  |
| Wainscot, Ripa, &c.                       | 2         | 15 | 0  | 4  | 5  | 0  | 0  |
| Oak, crown                                | 2         | 15 | 0  | 3  | 5  | 0  | 0  |
| Danls, Finland, 2nd and 1st. std. 100     | 9         | 0  | 0  | 10 | 0  | 0  | 0  |
| " 4th and 3rd.                            | 7         | 0  | 0  | 8  | 10 | 0  | 0  |
| Riga                                      | 7         | 0  | 0  | 8  | 0  | 0  | 0  |
| St. Petersburg, 1st yellow                | 10        | 0  | 0  | 15 | 0  | 0  | 0  |
| " 2nd                                     | 9         | 0  | 0  | 10 | 0  | 0  | 0  |
| " white                                   | 8         | 0  | 0  | 10 | 0  | 0  | 0  |
| Sweden                                    | 7         | 10 | 0  | 18 | 0  | 0  | 0  |
| White Sea                                 | 8         | 10 | 0  | 17 | 0  | 0  | 0  |
| Canada, Pine, 1st                         | 18        | 0  | 0  | 25 | 10 | 0  | 0  |
| " 2nd                                     | 11        | 0  | 0  | 17 | 10 | 0  | 0  |
| " 3rd, &c.                                | 7         | 10 | 0  | 10 | 0  | 0  | 0  |
| St. Russia                                | 9         | 10 | 0  | 10 | 0  | 0  | 0  |
| " 3rd and 2nd                             | 7         | 0  | 0  | 8  | 10 | 0  | 0  |
| New Brunswick, &c.                        | 6         | 15 | 0  | 8  | 15 | 0  | 0  |
| Baltics, all kinds                        | 5         | 10 | 0  | 12 | 0  | 0  | 0  |
| Flooring Boards, 9, 1 in. prepared, First | 0         | 11 | 0  | 0  | 14 | 6  | 0  |
| Second                                    | 0         | 8  | 0  | 0  | 10 | 9  | 0  |
| Other qualities                           | 0         | 5  | 0  | 0  | 7  | 9  | 0  |
| Cedar, Cuba, 1st                          | 0         | 9  | 0  | 0  | 4  | 4  | 0  |
| Honduras, &c.                             | 0         | 0  | 3  | 0  | 0  | 4  | 0  |
| Australia                                 | 0         | 0  | 3  | 0  | 0  | 3  | 0  |
| Mahogany, Cuba                            | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| St. Domingo, cargo average                | 0         | 0  | 4  | 0  | 0  | 4  | 0  |
| Mexican                                   | 0         | 0  | 4  | 0  | 0  | 4  | 0  |

| TIMBER (continued).               |   | £. | s. | d. | £. | s. | d. |
|-----------------------------------|---|----|----|----|----|----|----|
| Mahogany, Tobacco, cargo average. | 0 | 0  | 4  | 0  | 0  | 4  | 0  |
| Honduras                          | 0 | 0  | 4  | 0  | 0  | 4  | 0  |
| Box, Turkey                       | 8 | 0  | 0  | 12 | 0  | 0  | 0  |
| Walnut, Italian                   | 0 | 0  | 4  | 0  | 0  | 4  | 0  |

| METALS.                     |     | £. | s. | d. | £. | s. | d. |
|-----------------------------|-----|----|----|----|----|----|----|
| Iron—Bar, Welsh, in London. | ton | 4  | 17 | 6  | 5  | 0  | 0  |
| " at works in Wales         | 4   | 7  | 6  | 4  | 10 | 0  | 0  |
| " Staffordshire, in London  | 5   | 15 | 0  | 7  | 0  | 0  | 0  |

| COBBES.                  |     | £. | s. | d. | £. | s. | d. |
|--------------------------|-----|----|----|----|----|----|----|
| British, cake and ingot. | ton | 80 | 0  | 0  | 0  | 0  | 0  |
| Best selected            | 80  | 10 | 0  | 0  | 0  | 0  | 0  |
| Sheet, strong            | 84  | 0  | 0  | 88 | 0  | 0  | 0  |
| Chili, bars              | 78  | 0  | 0  | 0  | 0  | 0  | 0  |
| YELLOW METAL.            | 0   | 0  | 7  | 0  | 0  | 7  | 0  |

| LEAD.          |     | £. | s. | d. | £. | s. | d. |
|----------------|-----|----|----|----|----|----|----|
| Pig, Spanish   | ton | 13 | 10 | 0  | 0  | 0  | 0  |
| Sheet, English | 14  | 15 | 0  | 0  | 0  | 0  | 0  |

| SHEETS.           |     | £. | s. | d. | £. | s. | d. |
|-------------------|-----|----|----|----|----|----|----|
| Silesian, special | ton | 18 | 7  | 6  | 18 | 10 | 0  |
| Ordinary brands.  | 18  | 5  | 0  | 18 | 7  | 6  | 0  |

| TIN.               |     | £. | s. | d. | £. | s. | d. |
|--------------------|-----|----|----|----|----|----|----|
| Straits            | ton | 98 | 0  | 0  | 0  | 0  | 0  |
| Australian         | 98  | 0  | 0  | 0  | 0  | 0  | 0  |
| English Ingots.    | 101 | 0  | 0  | 0  | 0  | 0  | 0  |
| Zinc—English sheet | ton | 22 | 10 | 0  | 23 | 10 | 0  |

| OILS.                  |     | £. | s. | d. | £. | s. | d. |
|------------------------|-----|----|----|----|----|----|----|
| Lined                  | ton | 18 | 7  | 6  | 18 | 10 | 0  |
| Coconut, Ceylon        | 28  | 10 | 0  | 29 | 0  | 0  | 0  |
| Ceylon                 | 27  | 0  | 0  | 0  | 0  | 0  | 0  |
| Palm, Lagos            | 28  | 10 | 0  | 0  | 0  | 0  | 0  |
| Repacked, English pale | 31  | 10 | 0  | 0  | 0  | 0  | 0  |

| LUBRICANTS.         |    | £. | s. | d. | £. | s. | d. |
|---------------------|----|----|----|----|----|----|----|
| " brown             | 30 | 0  | 0  | 0  | 0  | 0  | 0  |
| Cottonseed, refined | 23 | 15 | 0  | 0  | 0  | 0  | 0  |
| American, in casks. | 19 | 0  | 0  | 46 | 0  | 0  | 0  |
| Lubricating, U.S.   | 5  | 0  | 0  | 0  | 0  | 0  | 0  |

| TEMPERATURE.        |        | £. | s. | d. | £. | s. | d. |
|---------------------|--------|----|----|----|----|----|----|
| American, in casks. | cwt.   | 1  | 14 | 9  | 0  | 0  | 0  |
| Tar—Stockholm       | barrel | 1  | 1  | 6  | 1  | 1  | 9  |
| Archangel           | 0      | 12 | 0  | 0  | 12 | 6  | 0  |

## COMPETITIONS, CONTRACTS, &amp; PUBLIC APPOINTMENTS.

Epitomes of Advertisements in this Number.

## COMPETITIONS.

| Nature of Work.                            | By whom required.     | Premium.             | Designs to be delivered. | Page. |
|--------------------------------------------|-----------------------|----------------------|--------------------------|-------|
| Laying-out Hotel and Gardens, Isle of Man. | Manx Syndicate, Lim.  | 70l., 20l., and 10l. | Jan. 30th                | ii.   |
| Three New Schools                          | Darford School Board. | 20l. and 5l.         | Not stated.              | ii.   |

## CONTRACTS.

| Nature of Work, or Materials.             | By whom required.                       | Architect, Surveyor, or Engineer. | Tenders to be delivered. | Page. |
|-------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------|-------|
| Public Market Hall                        | Rotherham Corporation                   | A. Neill                          | Dec. 28th                | ix.   |
| Making-up Roads                           | Chiswick Local Board.                   | A. Ramsden                        | Jan. 2nd                 | ix.   |
| Construction of Streets, &c. &c.          | E. H. Warner, Esq., & Captain Warner    | W. E. Woolley                     | Jan. 3rd                 | ix.   |
| Additions to Hammersmith Police Court     | H. M. Works                             | Official                          | Jan. 4th                 | ix.   |
| Construction of Sewers, and Lamp Columns  | Hornsey Local Board                     | T. de Courcy Meade                | Jan. 7th                 | ix.   |
| Work Room                                 | Edmonton Union.                         | T. E. Knightley                   | Jan. 8th                 | ix.   |
| Roadmaking and Paving Works               | Fulham Vestry                           | J. P. Norington                   | Jan. 8th                 | ix.   |
| Supply about 1,000 sq. yds. of Paving     | St. George-the-Martyr Vestry, Southwark |                                   | Jan. 22nd                | ix.   |
| Small Concrete Pier, Babbacombe Bay       | St. Mary Church Local Board             | L. F. Vernon-Harcourt             | Jan. 29th                | ix.   |
| Stores, Materials, and Execution of Works | Liverpool Corporation                   | Official                          | Not stated.              | ix.   |

## PUBLIC APPOINTMENTS.

| Nature of Appointment. | By whom advertised.  | Salary.    | Applications to be in. | Page. |
|------------------------|----------------------|------------|------------------------|-------|
| Draughtsman            | Civil Service Com.   | Not stated | Jan. 10th              | xiv.  |
| Clerk of Works         | Barking Local Board. | 3s. a week | Not stated.            | xiv.  |

## TENDERS.

[Communications for insertion under this heading must reach us not later than 12 Noon on Thursdays.]

AUDRENSHAW.—For sewerage, paving, kerbing, and flagging Martin-street, Bridge-street, Mount Pleasant-street, No. 1, and Mount Pleasant-street, No. 2. Mr. J. H. Burton, Surveyor, Warrington-street, Ashton-under-Lyne.

Worthington & Pownall, Rushmore-road, Manchester. (Accepted at per schedule of prices. Ten tenders were received.)

BADWICK (Herts).—For the erection of the "Factory Arms" Public House, Badwick, Herts. for Messrs. McMullen & Sons, Ware, Hertford. Mr. Alick G. McDermott, architect, Ware. Quantities by Mr. Henry Theau, F.A.S.I., 87, Finsbury-pavement.

BRENTFORD.—For levelling the recreation-ground, for the Brentford Local Board. Mr. F. W. Lacey, A.M.I.C.E., surveyor—  
T. Street, Houslow ..... £367 15 4  
S. Saunders, Fulham ..... 253 2 0  
W. O'Brien, Brentford ..... 240 17 6  
W. Neave & Son, Paddington ..... 243 0 0  
G. Fraser & Son, Battersea-park, S.W. \* 157 1 6 1

[Surveyor's estimate, £225.]

BEDFORD.—For the erection of St. Martin's Church.

Mr. J. A. Clatwin, architect, Birmingham—  
Haynes ..... 5,385 0 0  
Coleman & Fathens ..... 4,921 0 0  
Osborn ..... 4,761 0 0  
Tomlinson ..... 4,150 0 0  
White ..... 4,697 0 0  
Collins ..... 4,048 0 0  
Corby ..... 3,972 0 0  
Watson & Walker ..... 3,937 0 0  
Foster ..... 3,849 0 0

BEDFORD.—For erecting new tower and copper-house and alterations to old buildings at the Horne-lane Brewery, for Mr. C. Wells, Mr. Arthur Kinder, architect, Suffolk House, Lawrence Pountney Hill, Cannon-street, London, E.C. Quantities by Mr. Alexander H. Kinder, 34, Clement-lane, London, E.C.

T. Spencer ..... £1,379 0 0  
W. Haynes ..... 1,351 0 0  
Watson & Walker ..... 1,328 0 0  
Freshwater & Sons ..... 1,315 0 0  
S. Foster (accepted) ..... 1,315 0 0  
[All of Bedford.]

BRIGHTON.—For erecting public elementary schools, on ground situated near Park-road, East Brighton, for the School Board for Brighton and Preston U.D. Mr. Thomas Simpson, architect—

| Mate     | Extra  | Total  |
|----------|--------|--------|
| Saunders | £2,734 | £2,734 |
| Lockyer  | 8,393  | 8,402  |
| Loupley  | 8,281  | 8,284  |
| Barnes   | 8,070  | 8,285  |
| Dean     | 7,900  | 8,284  |
| Taylor   | 7,900  | 8,284  |
| Chappell | 7,790  | 7,999  |
| Stimpson | 7,630  | 7,880  |

\* Accepted.

BROMLEY (Kent).—For laying 1,250 feet of 9-inch stoneware pipe sewer (Doulton's patent joints) in Plainstone-lane, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor—

W. & J. Woodhams ..... £182 0 0  
E. Fells & Sons ..... 187 10 0  
T. Lansbury (accepted) ..... 186 0 0

BULTH.—For erecting semi-detached villa residences, Bulth, Mr. S. H. Cowper-Coles, architect—  
H. Owen, Bulth ..... £260 0 0  
J. M. Jones, Bulth ..... 720 10 0  
A. Meredith, Newbridge-on-Wye \* ..... 708 0 0  
\* Accepted.

COLCHESTER.—For the erection of new curries' factory, Factory-lane, Colchester, for Messrs. Warrington & Co. Mr. J. F. Goodey, architect, Colchester—  
C. R. Orfeur, Colchester ..... £2,100 0 0  
H. Everett & Son, Colchester ..... 2,000 0 0  
W. A. Chambers, Colchester ..... 1,985 0 0  
G. Grimwood & Son, Sudbury ..... 1,870 0 0  
G. Dobson, Colchester ..... 1,830 0 0  
H. Ambrose, Colchester ..... 1,825 16 0  
A. Dias, Colchester ..... 1,780 0 0  
F. Dupont, Colchester ..... 1,735 0 0

COLCHESTER.—For the erection of four cottages, West Maresa, for Mr. H. Massett. Mr. J. F. Goodey, architect, Colchester—  
W. Shead, Benchurch ..... £711 0 0  
G. Dobson, Colchester ..... 694 0 0  
F. Dupont, Colchester ..... 615 0 0  
H. Ambrose, Colchester ..... 606 15 0  
A. Dias, Colchester ..... 585 0 0  
C. R. Orfeur, Colchester ..... 587 0 0

COLCHESTER.—For the erection of new grain store, East Mills, Colchester, for Messrs. E. Marriage & Son. Mr. J. F. Goodey, architect, Colchester—  
A. Dias, Colchester ..... £2,460 0 0  
H. Everett & Son, Colchester ..... 2,317 0 0  
G. Grimwood & Son, Sudbury ..... 2,285 0 0  
G. Dobson, Colchester ..... 2,228 0 0  
F. Dupont, Colchester ..... 2,275 0 0  
W. A. Chambers, Colchester ..... 2,179 0 0

CROMER.—For Deepening No. 1 Well for the Cromer Water-works Company, at Cromer. Mr. J. C. Mellis, engineer—  
J. Villiers, East Gate, Beverley ..... £1,236 0 0  
E. Timmins, Bridgewater Foundry, Runcorn ..... 949 0 0  
L. Hills & Co., 136, Old-street, London, E.C. ..... 622 0 0  
T. Tilley & Son, 15, Walbrook, London, E.C. (accepted) ..... 475 17 6 1

CROYDON.—For laying out and constructing recreation grounds, &c., in the Borough of Croydon, for the Corporation of Croydon—

Stables Head.  
A. Bullock ..... £1,923 4 0  
H. Lake ..... 1,100 18 8  
W. Langridge (accepted) ..... 934 10 6  
H. Streeter ..... 893 4 0

Brighton-road.  
H. Streeter ..... £290 2 6  
W. Langridge ..... 362 5 9  
A. Bullock (accepted) ..... 372 4 4

Cranden-road.  
W. Langridge ..... £330 17 6  
A. Bullock (accepted) ..... 232 0 0

South Norwood.  
Clarke ..... £283 4 4  
T. Butcher ..... 647 1 9  
H. Streeter ..... 644 14 2  
A. Bullock ..... 588 5 11  
H. Lake (accepted) ..... 597 9 10  
W. Langridge (accepted) ..... 598 12 1

Upper Norwood.  
Clarke ..... £1,068 18 9  
W. Langridge ..... 998 13 11  
A. Bullock ..... 944 9 9  
H. Lake (accepted) ..... 897 13 4  
H. Streeter ..... 785 9 9  
[All of Croydon.]

CROYDON.—For the erection of two villa residences at Bismund-street, Croydon, for Mr. I. Kendall, Mr. E. C. Homer, architect, 80, Gresham-street, E.C. Quantities by Mr. S. Baron Snell, F.R.I.B.A., architect—  
A. Nash (accepted) ..... £2,156 0 0

FULHAM.—For the erection of new married couples' quarters and covered ways at the Fulham-road Workhouse, for the Guardians of the Poor of the St. George's Union. Mr. E. Baron Snell, F.R.I.B.A., architect—

W. Oldrey & Co. .... £1,750 0 0  
Wardle, Clark, & Co. .... 1,696 0 0  
Jas. Holloway ..... 1,670 0 0  
F. & H. F. Higgs ..... 1,580 0 0  
J. Allen & Sons ..... 1,513 0 0  
Wall Bros. .... 1,497 0 0  
Multon & Wallis ..... 1,464 0 0  
A. B. Flew & Co. .... 1,385 0 0

HORNSEY.—For making-up private roads, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor—

Shepherd's-hill.  
Aspinall & Son, Finsbury Park ..... £3,800 0 0  
Dunmore, Crouch End ..... 3,700 0 0  
Mowlem & Co., Westminster \* ..... 3,349 0 0

Walsley-road.  
Aspinall & Son, Finsbury Park ..... £2,349 0 0  
Dunmore, Crouch End ..... 2,340 0 0  
Mowlem & Co., Westminster \* ..... 2,133 0 0

Wargyng-road.  
Mowlem & Co., Westminster ..... £297 0 0  
Dunmore, Crouch End ..... 293 0 0  
Aspinall & Son, Finsbury Park ..... 234 0 0

Walsley Park-road.  
Aspinall & Son, Finsbury Park ..... £3,815 0 0  
Dunmore, Crouch End ..... 3,799 0 0  
Mowlem & Co., Westminster \* ..... 3,683 0 0

Elder-avenue.  
Aspinall & Son, Finsbury Park ..... £1,180 0 0  
Mowlem & Co., Westminster ..... 1,112 0 0  
Dunmore, Crouch End ..... 950 0 0

Weston Park.  
Aspinall & Son, Finsbury Park ..... £859 0 0  
Dunmore, Crouch End ..... 893 0 0  
Mowlem & Co., Westminster \* ..... 834 0 0

\* Accepted.

LONDON.—For pulling down and rebuilding 370 and 372, Holloway-road, and 2, Tollington-road, for Mr. Wm. Beale—

Wm. Oldrey & Co., Westbourne-park, W. (accepted) ..... £12,451 0 0

[No competition.]

**LONDON.**—For the erection and completion of stables, loose boxes, forge, office, and surgery, at Montpelier House, Hornsey-road, for Mr. A. Stanton. Mr. W. Smith, architect, 80, Upper Tooting Park:—

|                        |          |
|------------------------|----------|
| Ward & Lambie .....    | 2073 0 0 |
| Macfarlane Bros. ....  | 954 0 0  |
| Lark & Son .....       | 920 0 0  |
| Clark .....            | 897 0 0  |
| Stevens Bros. ....     | 887 0 0  |
| R. D. Lown & Son ..... | 835 0 0  |
| C. Deering & Son ..... | 800 0 0  |
| Langham .....          | 799 0 0  |

**LONDON.**—For altering premises to form new fermenting room for 110 barrel tuns, for Messrs. West & Co., Hackney-road, London. Messrs. Llewellyn & James, architects and engineers, Bristol. Quantities by the architects:—

|                                         |          |
|-----------------------------------------|----------|
| H. Adamson & Son, Chiswick .....        | 2475 0 0 |
| T. Mappell, Finsbury .....              | 469 0 0  |
| Collis & Son, Moorgate-street .....     | 476 0 0  |
| H. D. Evans, Hornsey-rise .....         | 400 0 0  |
| C. Cox, Hackney .....                   | 381 0 0  |
| Wall Bros., Kentish-down .....          | 381 0 0  |
| Stephens & Baxton, Stewart's-road ..... | 355 0 0  |

(accepted).  
**LONDON.**—For alterations, repairs, and drainage work at 24, Bishop's-road, Mr. Edgar H. Selby, architect and surveyor, 28, Craven-street, Strand, W.C.:—

**MANSFIELD.**—For providing and laying cast-iron water-mains and incidental apparatus, for the Mansfield Rural Sanitary Authority. Mr. George Hodson, engineer, Loughborough:—

|                                          |            |
|------------------------------------------|------------|
| A. Knighton, Mansfield .....             | 23,020 0 0 |
| Oakes & Co., Alfreton .....              | 2,180 0 0  |
| John Unsworth, Manchester .....          | 2,541 2 8  |
| Jas. Bush & Co., Preston .....           | 1,954 0 0  |
| Marriott & Marshall, Alfreton .....      | 1,941 17 2 |
| David Barry, Ratcliffe .....             | 1,888 0 0  |
| John Lane, Skegby .....                  | 1,848 18 0 |
| J. F. Price, Nottingham .....            | 1,771 0 0  |
| H. Vickers, Nottingham .....             | 1,715 0 0  |
| L. Foster, Ratcliffe .....               | 1,700 0 0  |
| Pickhill & Sons, Metherby .....          | 1,690 3 6  |
| E. Burrows, Barnsley .....               | 1,688 8 8  |
| Jas. Dickson, St. Albans .....           | 1,683 0 0  |
| Joseph Tomlinson, Derby (accepted) ..... | 1,674 18 4 |
| Chas. Green, Rotham .....                | 1,648 11 0 |

**PONDER'S END (Middlesex).**—For alterations and repairs to the "Boundary House" public-house, for Mr. G. Gripper. Messrs. Searle, Halton & Bowyer, architects, Tottenham:—

|                                 |           |
|---------------------------------|-----------|
| Knight, Tottenham .....         | 2187 18 8 |
| Lawrence, Waltham .....         | 132 8 0   |
| Monk, Edmonton (accepted) ..... | 113 0 0   |

**SLOUGH.**—For the erection of the Leopold Institute, Public Hall, and Corn Exchange, Slough, Bucks. Mr. Henry A. Cheers, architect:—

|                                        |            |
|----------------------------------------|------------|
| Watson, Ascot .....                    | 25,593 0 0 |
| Crowhurst, Slough .....                | 5,573 0 0  |
| Symonds, Reading .....                 | 5,475 0 0  |
| Grist, Aylesbury .....                 | 5,418 0 0  |
| Smith & Sons, London .....             | 5,335 0 0  |
| Hensley & Co., London .....            | 5,252 0 0  |
| Bradley & Co., Wolverhampton .....     | 5,182 0 0  |
| Green, Aylesbury .....                 | 5,112 0 0  |
| Shillitoe, Bury St. Edmunds .....      | 4,993 0 0  |
| Page, Banbury .....                    | 4,995 0 0  |
| Inwood, Malvern .....                  | 4,975 0 0  |
| Hickmortham, Teddington .....          | 4,765 0 0  |
| T. Martin, Maidenhead (accepted) ..... | 4,655 0 0  |

**SOUTHAMPTON.**—For alterations and re-seating Above Bar Chapel, High-street, Southampton. Mr. W. H. Mitchell, architect:—

|                                            |            |
|--------------------------------------------|------------|
| Dyer & Sons, Southampton .....             | 25,370 0 0 |
| W. H. Bull, Southampton .....              | 5,349 0 0  |
| Chapman, Southampton .....                 | 4,980 0 0  |
| Morgan, Isled, & Morgan, Southampton ..... | 4,696 0 0  |
| Stevens & Sons, Southampton .....          | 4,440 0 0  |
| Crook & Sons, Southampton .....            | 4,437 0 0  |
| Witt, Bitterne .....                       | 4,333 0 0  |
| Franklin, Southampton .....                | 3,989 0 0  |
| Kinglee, Oxford (accepted) .....           | 3,945 0 0  |

**FHAMES DITON.** For rebuilding the Ferry Engineering Works, recently destroyed by fire, for Messrs. Williams & Robinson, Limited, Thames Diton. W. Cunliffe, Kingston and Dorking (accepted at per schedule of prices).

**STRATFORD.**—For new show-rooms, &c., to premises, The Grove, Stratford, E., for Messrs. C. Boardman & Sons. Mr. George Baines, architect. Quantities by the architect:—

|                          |            |
|--------------------------|------------|
| F. & H. F. Higgs .....   | 22,990 0 0 |
| Hillingsworth .....      | 2,935 0 0  |
| M. Gentry .....          | 2,850 0 0  |
| J. Godfrey & Son .....   | 2,845 0 0  |
| S. J. Scott .....        | 2,597 0 0  |
| Battley .....            | 2,567 0 0  |
| Coxhead (accepted) ..... | 2,544 12 0 |

**SUTTON-IN-ASHFIELD.**—For extension of water supply to Kirby and Skegby, for the Sutton-in-Ashfield Local Board. Mr. George Hodson, engineer, Loughborough:—

|                                          |            |
|------------------------------------------|------------|
| David Barry, Ratcliffe .....             | 21,265 0 0 |
| Chas. Green, Rotham .....                | 1,779 0 0  |
| Leonard Foster, Ratcliffe .....          | 1,140 0 0  |
| James Dickson, St. Albans .....          | 1,118 0 0  |
| James Bush & Son, Preston .....          | 1,112 0 0  |
| J. F. Price, Nottingham .....            | 1,112 0 0  |
| Henry Borrowes, Barnsley .....           | 1,108 9 54 |
| H. Vickers, Nottingham .....             | 1,065 0 0  |
| Holme & King, Liverpool .....            | 1,056 0 0  |
| Joseph Tomlinson, Derby (accepted) ..... | 1,012 13 0 |

**WINCHMORE HILL.** For the erection of two additional pavilions, and alterations and additions to the Administrative Block at the Northern Hospital, Winchmore-hill, for the Managers of the Metropolitan Asylum District, under the superintendence of Messrs. Pennington & Bridgen, architects, 8, John-street, Adelphi, W.C. Quantities by Mr. W. T. Farthing, 40, Strand, W.C.:—

|                                   |            |
|-----------------------------------|------------|
| M. Bar .....                      | 12,800 0 0 |
| H. W. Bull .....                  | 12,849 0 0 |
| Balaam Bros. ....                 | 12,500 0 0 |
| W. Shurman .....                  | 12,286 0 0 |
| Kirk & Randall .....              | 11,953 0 0 |
| J. T. Chappell .....              | 11,695 0 0 |
| Staines & Son .....               | 11,590 0 0 |
| W. H. Lancelles & Co. ....        | 11,225 0 0 |
| E. & E. Evans .....               | 11,225 0 0 |
| Wall Bros. ....                   | 11,197 0 0 |
| W. Johnson .....                  | 11,094 0 0 |
| W. Brass & Son (accepted) .....   | 10,863 0 0 |
| J. Godfrey & Son (accepted) ..... | 10,813 0 0 |
| Caplen & Redgrave .....           | 10,542 0 0 |

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# The Builder.

Vol. LV. No. 2205.

SATURDAY, DECEMBER 29, 1888

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Proposed Errington Memorial Clock-Tower, Colchester.—Designed by Mr. Charles F. Hayward, F.S.A. .... Single-Page Ink-Photo.  
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### Hexham Abbey Church.



ONCERNING the history of the grand Abbey Church of St. Andrew at Hexham, on the Tyne, of which only the choir and transepts now remain, more information

is on record than in the case of some churches of wider fame. The Latin history by Richard of Hexham, in the twelfth century, is remarkable for the full account given, as far as the writer was able to express himself in a manner intelligible to modern architects, of the nature of the first Saxon church, built by St. Wilfrid, at Hexham, dating from the seventh century, and which appears to have been, unless Richard was much carried away by his enthusiasm, a very remarkable and ambitious building for those times. There is sufficient on record as to the later times of the Abbey to furnish matter for a tolerably full historical sketch, which has been best set forth in a form convenient for general readers in the treatise by the Rev. Jas. Raine, which forms Volumes xlv. and xlvi. of the "Transactions" of the Surtees Society of Durham, to which the account by Richard of Hexham, as well as copies of many other old documents relating to the church, are added as an appendix. This treatise is partially illustrated with one or two engraved views, and some excellent engravings of a few interesting pieces of ornamental detail from Hexham and its neighbourhood. The thorough illustration of a building of this kind by measured drawings of the whole, and careful sketches of all the detail, was an enterprise seldom undertaken till within recent years; and in regard to illustrations, of course Mr. Raine's treatise is very inadequate, serving as little more than a few hints of what is in the building; but the literary portion of his work appears to summarise all the information of importance which is extant in regard to Hexham Abbey, nor does the author of the splendid folio monograph\* now brought out profess, as far as we observe, to bring any new facts to light in regard to the history of the building, except

in the shape of reproductions of some old drawings not known at the time when he commenced his arduous labours, and of a new suggestion as to the real history of the nave. But it has been reserved for him to illustrate adequately for the first time the church of Hexham, and his work is a worthy contribution to that class of monograph illustrations of great buildings of this country, which are amongst the finest treasures of modern archaeological libraries. Nothing so sumptuous and complete of this kind has appeared from the pen and pencil of an English architect since Mr. Neale's great work on St. Alban's Abbey.

According to another comparatively modern collector of chronicles of Hexham Abbey and its neighbourhood, Wright, whose concise but interesting and well-written essay was published at Alnwick in 1823, the Saxon church at Hexham was the third in point of time that was built of stone in this country, and the first in the county of Northumberland. In regard to the etymology of the name of Hexham he observes that it "overlooks the course of the brooks Hextol and Halgut and their junction with the Tyne. Hence have been imposed the various names of *Hutoldesham*, *Hestoldesham*, and *Hextoldesham*; *Hagustald*, *Hangustald*, and *Halgutstad*." Richard of Hexham, in the place of *Hextol*, uses the Danish word *Hestild*; all the other varieties of the name preserve one uniform and simple meaning, which, in the pictorial language of our Saxon ancestors, accurately describes the characteristic of the little river, i.e., "Height of Source." Mr. Raine, however, regards the latter of the two names as being obviously of Christian origin with a different signification, "halig" being the Saxon "holy," and Halgutstad "the town on the holy stream," a name which, as he argues, bears evidence in itself of having been probably given when St. Wilfrid first made Hexham a kind of holy place; so that the two ancient forms of the name are probably not of the same date or precisely the same meaning. Mr. Hodges, treating entirely of the religious building, appropriately adopts one form of this latter name, "*Hagustald*," as the Latin title (*Hagustaldensis*) at the head of his title-page.

There are many relics of Roman work found on the site of Hexham Abbey, but Mr. Hodges, who resides at Hexham, and is, no doubt, well acquainted with the archaeology of the neighbourhood, is of opinion that these were not originally on the site, but were

brought there from the neighbouring site of Corbridge (the Roman *Corstopium*) at the time the Saxon Abbey was built; that the history of Hexham dates practically from the foundation of the Saxon Abbey, and that it was not a place of Roman occupation. Among his reasons for this opinion are that while Corbridge, as its name implies, 'possessed a bridge at an early date, Hexham, although situated very near the Tyne, never had any bridge till the year 1770. The tendency which seems to have been general over the whole Christian world in early centuries to work up old material from former Roman buildings, even when they had to be brought from some distance, is not without many known and obvious illustrations in this country; and from these and from other indications of the former importance of Corbridge, Mr. Hodges thinks we may fairly conclude that Saxon Hexham grew out of the transferred ruins of Roman Corbridge.

All accounts agree that the founder of the Saxon Abbey was Wilfrid, formerly Abbot of Ripon, where, as at Hexham, there are the remains of a curious and characteristic Saxon crypt, the two resembling each other so much as entirely to bear out the idea that they represent the work of the same man. According to the chronicle of Richard of Hexham, Queen Etheldreda, a woman of much saintly fame in her time, and who was apparently a special friend or patroness of Wilfrid, gave to him the town of Hexham and the region round about in perpetuity, that he might erect there a cathedral church. Of this church the undoubted crypt, or, at all events, one of the crypts belonging to it, now exists under the ground immediately westward of the crossing of the mediæval church. It was rediscovered in 1726, when an excavation was made with the view of forming a new buttress to the tower. This crypt, which is fully illustrated in plan and section and by views, on Plates 39 and 40, is a most curious relic of early building. It contains one passage of very pre-historic appearance, roofed with straight slabs of stone set up rafter-wise, others with apparent arches formed by corbelled-out stones with the ends cut into the arch shape; one a genuine arch in the Roman manner, built in close connexion with these; altogether a most singular medley of tentative masonry construction. This appears to be the only undoubted relic now left of the Saxon church, though Mr. Raine thinks that "a question may be raised whether a portion of the

\* *Eccllesia Hagustaldensis: The Abbey of St. Andrew, Hexham: a Monograph.* By Charles Clement Hodges, architect, author of illustrations of "The Priory Church of St. Mary, Ely, Nottinghamshire," &c. Privately printed for the author. 1888.



extreme western angle of the choir, where it joins the north and south wings of the transept, may not be of this early date. The contiguous piers of the tower are not bonded into these walls behind them." He adds:—

"If this supposition be correct, Wilfrid's church, —or, at all events, one which required rebuilding at the end of the twelfth century,—must have covered a considerable portion of the space occupied by the Early English structure, the central square of each being of the same dimensions; and this idea may derive some confirmation from the relative position of the older and the present choir and the crypt; for, if a line be drawn eastward through the centre of the latter, it will fall midway of the tower and these presumed angles of the Saxon choir."

We do not, however, see anything in Mr. Hodges' drawings to bear out this suggestion; nor, as far as we have observed, does he make any reference to it.

The description of this Saxon church by the monk Richard of Hexham, to which we have already referred, conveys a remarkable idea of it, and one quite at variance with our usual ideas about a Saxon abbey or cathedral. To quote the abbreviated paraphrase of the description given by Mr. Hodges, "it was begun by making, with great labour, crypts and subterranean oratories, which had many passages with many branches beneath the floor. The church above was built with stones squared and of various sizes, and supported by well-polished columns. It had three distinct stories, or levels, which were carried out to an immense length and height." (Apparently it had already developed, though probably in a rude form, the proper Gothic "order" of arcade, triforium, and clearstory.) "He also decorated the walls and the capitals of the columns by which they were supported, and the arch of the sanctuary, with figure subjects and statues, and many carved decorations in relief upon the stone, as well as pictures and paintings in great variety and wonderful beauty. The body of the church was surrounded with aisles and porches on every side, which, with surprising and inexplicable skill, communicated with each other by winding stairs in stone towers. In these tower stairs and above them were different ways leading to long galleries formed in the stone walls, with many turnings and branches, some leading up and some leading down, so ingeniously and artfully contrived that a great multitude of men might be there, surrounding the whole church, and yet not be seen by those on the floor below." This seems like a somewhat flowery description of the usual arrangement of triforium galleries and staircases in a mediæval cathedral. The chronicler goes on to say that this structure, in beauty and elaboration, could find no parallel in its day on this side of the Alps. Mr. Hodges considers that the church may well have been 200 ft. long, as it is said to have been far beyond its contemporaries, and as the Saxon church at Brixworth is 136 ft. in length. M. Haine considers, for the reasons given in a passage above cited, that the central tower or crossing area was identical with that of the present church in plan.

It seems probable, for reasons that we have not space to go into here, that the high altar of the Saxon church was nearly over the present Saxon crypt. What seems certain is that the church which called forth the enthusiasm of Richard of Hexham was, at all events, a very solid and durable structure. It was burned in the ninth century by the Scandinavian pirates, as much of it as would burn; it was burned again in 923, and before the Conquest it was again occupied by monks and secular priests; and after the Conquest it appears to have been still in such a condition as only to require decorating and beautifying to fit it for use. There is next to no Norman work in the church as now existing; there is no record of any; the Saxon walls seem to have remained standing till the Norman architecture was merged in the Transitional, and only then was rebuilding, or rather extension, commenced; and the new choir was commenced extending eastward of the Saxon altar. As the author remarks, the usual plan in rebuilding was to commence from the east wall of the choir

in its new position, and build westward. The reverse process seems to have been adopted at Hexham. The choir remains now as it was built in the Transitional and Early English period, except that the original east wall is wholly gone, and replaced by modern restoration. A part of the east wall fell in 1824, and was restored by Mr. Dobson, of Newcastle, in a wretched bastard Gothic, with a kind of Catherine wheel feature in the middle of the window-head. One or two illustrations are shown from old prints. Mr. Dobson had the good taste to be so dissatisfied afterwards with his own work that in 1858, when he was still living, and the question of restoration or destruction of the eastern aisle came under discussion, he succeeded in securing the decision in favour of destruction, in order to get rid of his own work. The east end has now, we presume, been restored in a manner more in accordance with the character of the rest of the church, but Mr. Hodges does not condescend to give any illustration of this portion.

What we see now at Hexham is the tower, transepts, and choir of a Transitional church, developing towards pure Early English in parts, with no nave, but with the remains of one which appears to have once existed. Mr. Hodges marshals before us some facts and data from which he draws the conclusion, with every appearance of probability, that the nave of which the remains are left never was completed. It is on record that the nave, or a nave, was destroyed by fire, tradition said, in a Scotch raid into Northumberland in 1296. It has generally been concluded that this was the nave of which we now find some remains. Mr. Hodges finds, however, that the west wall of the tower shows no signs of having ever been exposed to the action of fire. The existing remains, as far as anything can be made of their detail, appear to belong to the Perpendicular period. The Saxon nave is referred to as existing in the Chronicle of Lanercost, under the date 1296. The conclusion the author draws is that the old Saxon nave remained standing for a considerable period after the building of the choir; that it was finally removed owing to dilapidation, and to prepare for the building of a new nave, which was delayed till a late Gothic period, and never completed at all; and that the story of the destruction of the nave in the Scotch raid of 1296 is a fiction. This theory hangs together and appears to agree with the testimony of the remains; but if so, this is a remarkable and unique instance of an original Saxon cathedral nave lasting to so late a period. What an interest if we could only have kept it till now! It would probably have lasted, with proper care, which one may certainly conclude it never received.

So the church now stands, as shown in Mr. Hodges's effective perspective drawings of the exterior, as a choir and transepts of sternly plain Transitional and Early English character, with lancet windows with masses of wall between them, only ornamented by a corbelled arch over each pier, continuing the line of the window-head arches. The dilapidated appearance, well conveyed in the drawings, increases the stern and rather melancholy aspect of the exterior. An immense buttress projects westward from the tower, on what would have been the line of the nave arcade, to supply the counterfort which the latter should have supplied. The tower is a very low one, with shallow buttresses of the early type at the angles, and the same plain treatment of lancet arcade, the arches alternately covering a window and a wall. Mr. Hodges remarks, like other writers on Hexham, on the peculiar low towers of this and other large churches in this part of England; but neither he nor Mr. Raine glance at what we believe to have been the real reason of this. Frequent mention is made in both their works of the dread inspired by the Danish and Scandinavian pirates on the coast of this part of England, and even beyond the coast, since they often carried their raids inland. The late Edmund Sharpe, who, living as he did at Lancaster, was exceptionally well

acquainted with the Mediæval remains and history of this part of England, had arrived at the decided opinion that this characteristic of low towers (sometimes not rising beyond the ridges of the roofs) was the result of a desire not to make the churches conspicuous objects to the enemy from sea or from the coast, as such an object as a lofty tower in the distance would at once point out to them where they would be likely to find a convent to plunder. This theory has the merit, at least, of giving a distinct and practical reason for a peculiarity in tower-building in this part of England for which we have never heard any other explanation given. We may depend upon it there was some reason for the prevalence of very short towers in this neighbourhood, and if any one knows of a better and more direct reason than this let him give it.

The general architectural scheme of the choir and of the eastern side of the transept is shown in the section (see lithograph plate) reduced from plate 13 in the book. The church was, with the exception of some special portions, built very slowly, and the progress from Transitional to Early English feeling is visible here in comparing the lower portions with the clearstory; the narrow, pointed arches between the clearstory windows being distinctly "lancet" architecture. One of the most curious features in Hexham is the slype, which is shown in section at the right-hand end of this drawing. As will be seen, instead of being, as usual, outside the wall of the south transept, it is within the church, forming a space partitioned off, and leaving a large platform or gallery over it at the south end of the transept, to which ascent is made by a great flight of steps against the whole west wall of the south transept, forming a remarkable feature in the interior of the church. The west wall of the transept differs materially from the east wall in design. There is no western aisle to the transepts, and no triforium. In the south transept the ground-story is a blank wall, against which ascends the staircase just mentioned, leading to the top of the slype, and in the place of the triforium are four short lancet windows, spaced wide apart, and not ranging under the clearstory grouping of windows, which has been set out without regard to them. The design in the north transept is much finer and more effective, and seems to be later than that of the south transept. Here there is a small trefoil-arch wall-arcade near the ground, in the manner so common in Early English work, and over this a series of lofty single lancet windows running right up to the top of what would have been the triforium stage, with narrower wall-arches between, ranging with the windows. In this case the clearstory is set out in accordance with the openings below it. A noticeable point in these long lancet windows and openings is that the lower portion of the jambs for about one-third of the whole height is richly moulded with roll mouldings, treated as shafts, with caps and bases, the remainder of the pier having only a simple moulding at the angle. The effect of this as shown in one of the perspective views is unusual and striking.

The Chapter-house is ruined, only the walls of the vestibule being left. Mr. Raine states that the Chapter-house was, within his memory, used by a butcher as a slaughter-house. Eastward of the choir there was a low building, of Late Gothic date, and evidently built to provide space for a series of chapels. This, from a photograph, which is reproduced, taken in 1858, had apparently become very dilapidated, and must have fallen soon; it was removed the same year,—a year memorable for a complete havoc in the church in the way of so-called "restoration," during which all the fittings of the choir were removed and knocked about and replaced in this or that situation, according to chance or the caprice of the depredators; the carved tombstones from old graves being used by the contractor and his men in building the walls for the heating apparatus. Mr. Hodges quotes the strong comments made in this



journal at the time of the proceedings. In regard to this particular point of the removal of the eastern chapels, however, we do not see that anything else could have been done; judging from the photograph, they would have been a danger if left in their then state, and Mr. Hodges will probably agree with us that no good purpose could have been served by rebuilding them with newly-worked stone in imitation of the original, at a time when no ritual use for the structure was apparent.

There are two pages of reproductions of former views of Hexham, which are of some interest. A view of the remains of the conventual buildings, dated 1728, is given, and a rough sketch made in 1790 by John Carter, by whom a number of sketches of the building, or of details connected with it, are preserved in the British Museum. The two views confirm each other as to general correctness. Then there is the "north prospect of the conventual church of Hexthedenham," reproduced from the first edition of the "Monasticon Anglicanum," published in 1661: "Steph. Anderton del.; D. King sculp." It is incorrectly called the north prospect; it is really more east than north, and shows the general proportions of the church, and the low building across the east end of the choir, &c., with that delightful indifference to any kind of correctness of detail which characterises the architectural illustrations of this date and type. The east-end shows a large Perpendicular window, filling up nearly the whole end of the choir, and which must have cut into the roof if it had been really as high as is shown; but the draughtsman probably was only anxious to convey as thoroughly as possible the fact that a very large window had been put in. This was the precursor, we presume, of Mr. Dobson's unfortunate modern "Decorated" east window before referred to. The original east-end, no doubt, had a series of lofty lancet windows; but no record of any kind remains of this portion of the original choir. We have also a reproduction of one of those delightful prim engravings of the interior of churches in their churchwarden state, which were current in the days of our grandfathers; this (dated 1815) represents the choir of Hexham, looking east, with the Dobson window at the end, and galleries running between and in front of the piers of the arcade; and under the east window is seen dimly an indication of the wooden classical redos built out in front of the fine Gothic one, which moved the sarcasm of the worthy Wright, who stigmatises it as, in a sense, "the most Gothic part of the whole edifice." On one of these galleries, near the pulpit, Wright informs us, there was placed the following inscription:—

This gallery was built in the year 1740  
By Sir Edward Blackett, Bart., at his sole expense,  
And given by him to this church for the use of the public,

Reserving only the front seat to himself.

Modest and benevolent baronet! We are not everywhere so much advanced beyond this stage as may be supposed. We know of a parish church in a small county town where the great man of the place—a puissant nobleman inhabiting an ancient "seat" contiguous to the town, claims and apparently enjoys the right (at all events did very recently enjoy it), when he and his retainers on rare occasions attend service at the church, to sit in the choir stalls, and turn the choir out for the occasion. Sir Edward Blackett was content with the front row of his own gallery, at all events.

Another relic of the Classic period, less objectionable, perhaps, than the galleries, was the north door made in the church at the cost of the Mercers' Company of London, who were great benefactors to the church. This was removed in 1869; Mr. Hodges gives a drawing of it from remaining fragments and photographs, from which it appears to have been a respectable door of the Roman-Doric persuasion. Critical Mr. Wright is sarcastic about this too. "This door is modern and in wretched taste; but it seems we owe it to the charity of the Mercers' Company, in London, who have been great benefactors to the church,

and their good wishes as well as good services merit our gratitude." Mr. Hodges laments its removal, evidently regarding this as a piece of the iniquity of the restoring Philistine. On the whole, considering the utter want of perception of style or congruity shown in introducing such a door into a Gothic church, we should be inclined to side with Wright, and at all events to look leniently on the sin of its removal.

Of the remarkable beauty and interest of the detail about Hexham, both in the architecture and in the ancient fittings, Mr. Hodges has given ample illustration in his plates. The carved caps from the Lavatory, which are drawn separately, are exquisite specimens of the later and freer style of Gothic carving. The whole lavatory (of the Geometrical period) is a beautiful example of the finest class of work of its date. The earlier carved capitals from the church are in the usual style of Transitional and Early Gothic foliage. To the illustration of the Rood Screen, remarkable for the singular beauty of the tracery in its principal openings, several plates are devoted. The equally beautiful woodwork of Prior Leschman's screen is also drawn with the greatest care and finish. The example of this class of work which we have selected for reproduction (Mr. Hodges having been kind enough to suggest to us reproduction of one or two of the plates in our pages) is that of the remarkable painted screen shown on Plate 51, and dating from the later part of the fifteenth century. This was formerly one of the side screens of the choir. Carter notes on a drawing that it was in his time removed from the east end of the aisles of the choir and placed against the transept wall. Since then it has been placed over the rood-screen, and now it is used to ornament the partition between the modern vestry and the church. This pulling about was part of the restoring "raid" made in 1858-9. The figures represent the seven out of the twelve bishops of Hexham who were canonised; their names are painted in "black letter." The figures stand on floors painted to resemble black and red tiles, drawn as if seen in perspective. The whole makes an effective combination of architectural and painted detail, the carved canopies forming frames to the painting.

Our remarks are far from even suggesting all the interest of this work in illustration of a building so remarkable both architecturally and in its historical connexion. We congratulate Mr. Hodges on the successful completion of what must have been an arduous though interesting task, and on having added to our illustrative architectural literature a book which will be valued for its own sake, and which will probably serve to draw more attention to Hexham Church, which, being somewhat out of the beaten track, especially for those who live in the south of England, has probably been less visited and known than many mediæval monuments which cannot be said to be superior to it in interest.

The book is privately printed for the author in a limited edition of 400 copies, the lithographs being printed by Messrs. Geo. Waterston & Sons, of Edinburgh. Lithographer, printer, and binder have done their work well, and produced a handsome and durable-looking folio. A list of names of 149 subscribers to the work is printed, including a good many archaeological libraries; a list from which, as usual, the Library of the Royal Institute of British Architects is conspicuous by its absence.

#### ON SOME ANCIENT ETRUSCAN FRAGMENTS.

BY SIGNOR LUIGI BORSARI.

**I**MPORTANT topographical studies and archaeological researches have been made since last year (1887) at Civita Castellana (in the Etruscan territory) at the expense of the Italian Government, in order to complete the archaeological map of that part of Etruria.

This important work, for the archaeological survey of Central Italy, and especially of the territory inhabited by the ancient Falisci, has

been carried on by the distinguished architect, Count Cozza, under the direction of Comm. G. F. Gamurrini, Archaeological Commissioner for Tuscany and Umbria: and for the execution of the great archaeological map of Italy we are indebted to Prof. Barnabei, Director of Museums and Galleries, who has lent his valuable assistance in the technical direction of the work, and has been instrumental in obtaining the necessary support from Government.

A short time before the above studies and researches were started, the famous temple of Juno Falisca was discovered, with its very ancient altar formed of blocks of tufa, near two large caverns excavated in the rock.

A full description of this altar and of the temple was published by the Government under the title of *Notizia degli Scavi di Antichità*, 1887, p. 92.

The other temple, the remains of which it is our intention now to describe, was discovered while exploring the more elevated part of Civita Castellana enclosed and comprised within the hospital grounds. The modern buildings of that town may be said to have caused the destruction of the temple, and its valuable remains were largely taken advantage of for building purposes. Only large square tufa blocks were found at one side of the quadrilateral area from south to north.

The loss of the masonry and foundations of the temple, however, was amply compensated by the discovery of an extraordinary number of terra-cotta fragments and alto-reliefs belonging to the entablature, frieze, and cornice of the temple.

The terra-cotta fragments are of the period of the Græco-Campanian art, and according to the reconstruction made, after accurate and diligent studies, by Count Cozza, their disposition in regard to what constituted the pediment of the edifice is as follows:—

The corona of the terra-cotta cornice which formed the higher portion of the pediment consists of an elegant open-work enrichment (fig. 2), composed by the union of several

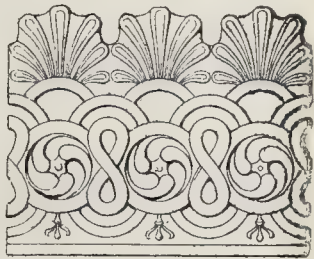


Fig. 2.

pieces, each measuring 45 centimètres high by 50 centimètres broad. The whole reconstructed cornice is shown in fig. 1 (see next page).

This sketch shows a series of interwoven ornaments, terminating in small palmettes or shell-like forms. In the lower part is a groove by means of which this piece of ornamentation was fixed to the decorative frieze underneath (fig. 3).

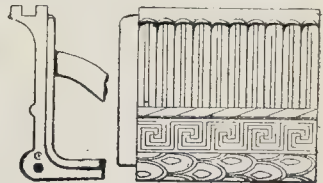


Fig. 3.

This lower portion of the cornice shows a very Egyptian-looking member formed of long parallel leaves on a slightly curved section; below it is a painted cable ornament, then a Greek fret, and a leafage roll ornament looking like an archaic form of the well-known Roman ornament, formed of a continuous



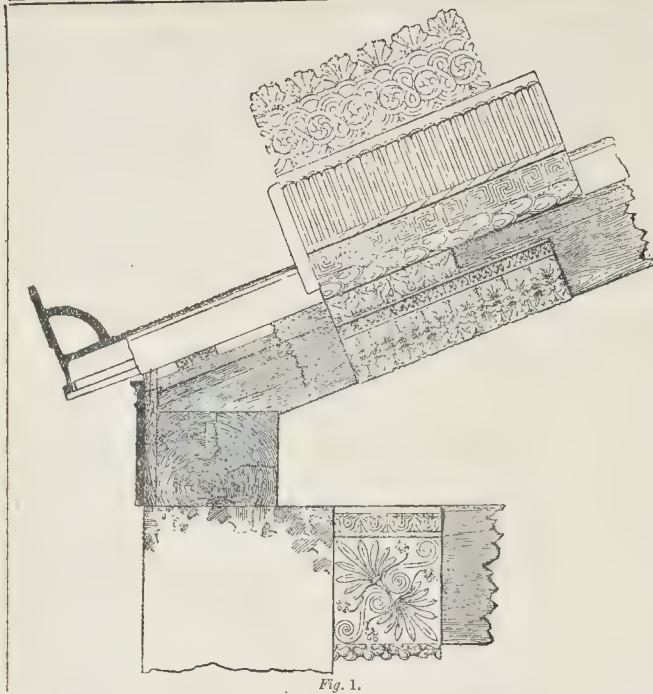


Fig. 1.

fillet of leaves. Below this come the plates covering the raking beam of the pediment, shown in figs. 4 and 6.

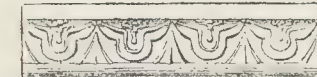


Fig. 4.



Fig. 5.



Fig. 6.

To the architrave, or horizontal beam, also, similar plates were attached, shown at large in fig. 6. The ornament filling the square

centre is purely Greek in form. It is painted pearl-white on a blue ground. The other ornaments are yellow on a pearl-coloured ground.

The ends of the side beams, running under the projection of the roof, one of which is seen at fig. 1, must have been decorated by a terra-cotta Gorgon's head, as is commonly seen on Etruscan sarcophagi sculptured in imitation of temples. All these terra-cotta reliefs and friezes and cornices were fastened to the woodwork by means of large bronze bolts, passing through holes which were made in the clay while it was still soft. A considerable number of these bolts have been collected. The edge of the roof on each side of the edifice had a border of antefixæ, 53 centimètres high, some of which, with a bearded figure, in a short garment or chiton, with large wings, bear a torch-light in each hand. Other antefixæ have been found with reliefs representing a winged female figure, covered by an ample robe, having long, loose, flowing hair, holding by the paws two tigers symmetrically placed. Antefixæ of this description are similar to those of the ancient temples of Alatri, and of other temples in the Campania. Some of them have also been lately found in the excavations of the Tiber.

L. B.

#### NOTES.

**T**HE new Wellington Statue by Mr. Boehm is a successful and satisfactory portrait monument rather than a work of genius. It has been already remarked in other quarters how completely Mr. Boehm has discarded the somewhat theatrical element which characterises the statue now at Aldershot, where the arm is outstretched in a rather too showy attitude of command. So far, the treatment is quite in keeping with the subject, for no great man was ever more simple and more destitute of the theatrical element in his character than Wellington. But the work, as a portrait statue, seems to present this negative kind of merit rather than any positive claim on our admiration; it is an unobtrusive and simply-treated portrait statue; a good and recognisable likeness, according to the many extant

portraits of the Duke; but it does not strike us as anything more than that. It is hardly even dignified, as far as the principal figure is concerned; it certainly is not impressive. It is possible to be too much afraid of "effect" in a portrait statue, and to go to the other extreme of a rather prim simplicity. There might have been, for instance, a little more prominence and energy given to the hand carrying what, we presume, is meant for the Field-Marshal's baton, instead of leaving it to hang rather limply at the side. And is there record that the Duke was in the habit of riding with his knees so much up as he is represented here? Such an attitude is not, we believe (though we speak under correction here) the orthodox military seat on horseback. On the whole, there is a certain disappointment in the feeling that, though the monumental statue of our great captain is admirably free from any kind of bad taste, there might have been something more made of it; some touch of the heroic which we cannot discern here. These remarks do not apply to the horse, which is a great success, a very fine and spirited animal indeed; and we also admire very much the supporting figures of soldiers at the angles of the pedestal, representing a Grenadier, a Highlander, a Lancer, and a Dragoon. There is a great deal of character about these figures, in which the sculptor has quite steered clear of the commonplace dressed-up soldier figure that we frequently see in sculpture; these are fine hardy types of men who look as those who have seen hard service and know more of war than its mere parade. The pedestal is not better nor worse than monumental pedestals generally are. The word "WELLINGTON" is inscribed in large letters on a panel on one side, but nothing seems to have been thought of for the corresponding panel on the other side, which remains empty and meaningless.

**I**T has long been felt that the postage rates to Australasia are too high, and repeated efforts have been made to obtain a reduction. The letter rate is more than double that with the Postal Union countries, and as post-cards have hitherto been issued to countries within the Union only, it has been impossible to communicate with Australia for less than 6d. The announcement just made by the Postmaster-General will, therefore, be received with considerable satisfaction. It has been arranged that, commencing with the New Year, letters will be conveyed by the "long sea route,"—i.e., per Orient and P. & O. steamers,—at the rate of 4d. per ½ oz., the rate *via* France and Italy remaining at 6d., as heretofore. Post-cards will also be issued at a charge of 2d. and 3d. by the respective routes. As there will be the alternative route, it will be advisable to state which mode of conveyance is intended; but the Postal authorities give notice that, in the absence of any such direction, the amount of postage prepaid will be taken to indicate the desired route. Of course there are no post-cards at present in use of greater value than 2d., but these will be available for Australia (with an extra 1d. stamp affixed when necessary), pending a new issue. These arrangements are all equally applicable to New Zealand and Fiji, the new cheap mails being made up once a week. The question of telegraphic communication with Australia is also still receiving a considerable amount of attention, and a thousand miles of cable for this service is leaving the Thames this week. This is for the purpose of duplicating part of the Eastern Extension Telegraph Company's system, connecting with a point in Western Australia. The Company are making energetic endeavours to counteract the proposed new scheme for a communication *via* Canada, by strengthening their own lines with a view of avoiding a recurrence of the breakdowns which created so much annoyance and mistrust. They profess to be quite confident of a reliable connexion in the future, and they must now turn their attention to reducing the price of messages.



A GREAT deal has been said at the recent Art Congress, as well as in connexion with the "Arts and Crafts" Exhibition, about the duty of designing with one's hand all the decoration that goes under one's own name. Our own conviction and predilection is in favour of this view; but as it is good that all sides of the question should be considered, we subjoin the following passage in favour of an opposite theory, from the paper on "The Proper Aim and Limits of the Coloured Decoration of Architecture," read at the National Art Congress by Mr. J. D. Crace:—

"There are now a considerable number of able 'ornamentists,' men who can design elegant and refined ornaments, details, able, original, and well-coloured paperhangings, pretty book-covers, charming illustrations, tiles, tapestries. They are often full of antique poems and legends, which they weave into their designs—sometimes gracefully, sometimes with affectation. But how few are the decorators, the men who are capable of giving to the architect's best work the best emphasis,—of seizing the main constructive idea,—and by a simple scheme of colour impressing on the spectator whatever is most noble in the outline and proportions; of adding to the grandeur or dignity of the architecture itself, while investing it with a robe of harmonious colour, not necessarily elaborating it with ornament."

It is this art of adding to the dignity of a building—of conveying by colour a sense of repose and completeness—which is at once the most difficult and the most worthy of the decorative arts. It does not necessarily involve a facility for ornamental design, though it is well when they go together; but I have sometimes found the men who are very able and inventive designers of detail, utterly unable to deal with the larger problems of decoration.

On this account it seems to me that very exaggerated importance has of late been attached to the fact of a man,—be he architect or decorator,—drawing all the detail of his own work. In many cases he would be doing far better to direct, control, and, where need be, correct the drawings of his staff. I lately heard it said of a man thus eager to do everything himself, that, 'were he a general, he would want to pipeclay the men's belts.' The fact is, that the man who must do everything himself is less a real friend to art, and has less of the old 'maestro' in him, than he who can get good men around him; can perceive what are the best qualifications of each; allot to each the work for which he is best qualified, and can inspire them all with sufficient confidence in himself to be able to lead, direct, and control them. This must always be true of all great undertakings, whether art be involved or not. The master-mind can draw out of those about him work infinitely superior to what the same men can produce when left to themselves. They are stimulated by intelligent guidance and criticism, and the work gains in vigour and freshness."

THE recent proceedings against the East and West India Dock Company, with the object of obliging them to build stronger bridges, so that trollies carrying engines and boilers weighing from twenty to thirty tons might pass over them in safety, have been dismissed in the Queen's Bench Division. This decision appears to be a reasonable one, and one also in the public interest, otherwise the burden upon the public and upon companies who, by Act of Parliament, have undertaken to stand in the shoes of the public—as, for instance, railway companies, who have to make and maintain bridges across their lines—would be enormous and vague. A railway company might have, in order to satisfy the wants of some new manufacturer, to rebuild, at a great cost, a bridge which for all ordinary purposes would be sufficient. The case is, therefore, noteworthy, because it puts clearly before the public the position occupied by highway boards and by companies on whom is cast by statute the duty of building and maintaining bridges.

THE abrading action of sand carried by the wind has in some parts an important influence on the formation of the surface of the globe. M. Thoulet has made some experiments in order to throw light on this question, and has contributed the results to the *Annales des Mines*. The apparatus used consisted of an air-pump to produce the necessary blast, the material operated upon being held in a box. The following are the general conclusions which M. Thoulet deduced from the experiments: (1) The abrasion is

directly proportional to the quantity of sand. (2) Stone resists abrasion better when polished than when rough. (3) Up to a certain point abrasion increases proportionately to the distance which separates the slab used from the orifice of the blast, but after that point is passed the abrasion decreases: the less the pressure the sooner the limit is attained. (4) Grains rounded by use produce less effect than those which are fresh and sharp. (5) The abrading action increases with the size of the grains of sand used. It was found that powdered limestone would not act on quartz rock, but limestone acting on limestone, or quartz on quartz, causes the same abrasion. The maximum effect was obtained from the sand of quartz injected on limestone.

PROFESSOR THURSTON has been making some experiments lately on the important, though comparatively unknown, subject of the amount of power absorbed by the friction of different moving parts of the steam-engine: and the result has been to considerably modify our preconceived notions in this matter. In the first place, he concludes that the internal friction of steam-engines is uniform, being correctly given under all loads by the ordinary friction diagrams. The main bearings are accountable for the greatest part of the total frictional resistance, in some cases amounting to half the total. Next in order comes the piston and piston-rod; but these naturally vary with the state of the packing. The minimum value was 20 per cent. of the total. The friction of an unbalanced slide-valve is about the same; but by balancing the valve, so as to take the steam pressure from its back, so low a figure as 2.5 per cent. of the whole can be reached. The crank-pin, connecting-rod, guides, and eccentrics do not give any considerable addition to the total of friction. Professor Thurston's experiments, the results of which have been given in full at a meeting of the American Society of Mechanical Engineers, are well worthy of study by English engineers.

ATTENTION is directed anew to the fatal facility with which milk lends itself to the propagation of infectious disease, and, therefore, to the need of the better sanitary supervision of dairies and milkshops. Dr. J. B. Russell, the indefatigable Medical Officer of Glasgow, has presented an exhaustive report to the Health Committee of the Town Council on a recent epidemic of scarlet fever in one of the best and healthiest parts of the City. This report is published in the last number of the *Sanitary Record*. Dr. Russell states that on Oct. 21 he became aware of "an almost simultaneous appearance of scarlet fever among many of the families living in the neighbourhood of West End Park. They had no community in any influence likely to produce such an outbreak save their milk supply, which was all derived from dairy X, one of the oldest and most reputable businesses in the trade." On investigation it was found that scarlatina or scarlet-fever had existed in the family of the dairymaid. The house, bedding, clothing, &c., were disinfected, and the door between the shop and the house was nailed up and covered by a permanent wooden partition. Dr. Russell points out "the folly of mixing up the milk business with the family life," and urges that "the most trifling illnesses either in man or beast should not be thought beneath attention where milk is concerned." In our opinion, "dairies" and milk-shops, and the dwelling-places of those who work and serve in them, ought to be under the most stringent supervision. Moreover, we do not think that a "dairy" or milkshop should be allowed under the same roof, or at any rate within the same tenement, as a dwelling house. A case in illustration of the necessity of stringency in this matter came under our personal observation a few years ago. In the main road of a pleasant and healthful London suburb was a milk-shop, dignified by the proprietor with the title of "The Model Dairy." To parody a line of popular verse, "Every-

thing within that shop was polished bright and clean,"—so far as the eye could judge. But behind the shop, and opening out of it by a glazed door, which was more often left open than closed, was the "model dairymaid's wife," with their little child, suffering from measles, in her arms! The child was within two or three yards of the open milk-pans on the counter. No wonder that measles was very prevalent in that neighbourhood just then.

A LARGE number of water-closet supply cisterns are now fixed, working on the siphon system,—the siphon being started by the raising, when the chain is pulled down, of a flat metal plate nearly fitting into the side compartment of the cistern, which throws the water above it sharply into the intake arm of the siphon, and thus starts it. The same action depresses the lever of a ball-tap, admitting the fresh supply, which is cut off in the usual manner when the ball is raised to the normal level. These cisterns act exceedingly well for the most part, but they have this defect, that if anything goes wrong with the ball-tap, preventing its closing properly, the syphon is in a position to go on drawing off the water through the supply cistern, until there is no more left to draw. We are induced to give a caution on the subject in consequence of a case which recently came under our notice, in a house in which the main cistern was found to have been mysteriously emptied on several occasions, to the great inconvenience as well as bewilderment of the inmates, who could not imagine where or how all the water had got away. At last an examination of the water-closet supply cisterns showed that the ball in one of them had leaked slightly, and become gradually weighted with water, so that it did not rise sufficiently to close the valve, and the whole of the water from the main cistern had been siphoned away into the drain. Of course, the ball ought not to have had any such defect; but as a ball-tap is a thing which not infrequently fails temporarily from one cause or another, it does not seem very desirable to have a communication with the closet which will have the power in such a case of drawing away all the water in the house. If the communication between the supply cistern and the closet were closed mechanically, the worst that would happen in case of the ball-tap failing to close would be a certain degree of direct communication between the closet and the main cistern; very undesirable, certainly, but not so bad as being left bare of water in a town where there is only intermittent supply.

AS will be seen by an announcement in our advertisement columns, the articles on, and illustrations of, Old English Cottage Architecture, by Mr. Ralph Nevill, which have been appearing in our pages during the half-year just completed, will shortly be issued as a separate publication.

THOUGH not yet complete, the Eiffel Tower at Paris seems already to have achieved a popular renown in the very streets of London. Some of our readers may have noticed a chromo-lithograph bird's-eye view of the Exhibition buildings, with the Eiffel tower in the foreground, which has been put in some shop-windows as an advertisement that the owner is prepared to make or let show-cases, &c., for the exhibition. Two or three very small boys of very much the lower order were looking at one of these in a shop-window, when we heard one say, "Yer wouldn't think that was three times as high 's Paul's, would yer?" The small boy not only knew more about the Eiffel tower than we should have expected, but was a better architectural critic than he was aware of. You certainly would not think in a picture that it was "three times as high as St. Paul's." There seems to have been no attempt at all to treat the design so as to give scale to it. We hear a good deal from time to time about the superior taste of the French, but nothing combining such bad taste with such blatant and offensive prominence as are



shown in the Eiffel Tower has ever been done in London yet. It is a mystery how such an artistic monstrosity came to be allowed in Paris.

AN amusing address by M. Roger Ballu, on "La Critique Contemporaine et L'Architecture," is reported in the last number of *L'Architecture*. M. Ballu does not find that the architectural room at the *Salon* receives any more attention than we find in the case of the architectural room at the Royal Academy. The first day, indeed, the authors of drawings come there to show them to their friends:—

"Puis il se fait un grand calme solennel, un silence, un vide que rien ne vient troubler; on se dirait dans l'esile de la paix et de la quiétude. Je dois reconnaître, soit dit en passant, que l'administration même du *Salon*, le Comité directeur, semble avoir été tellement découragé, qu'il a renoncé à établir, dans des salles d'architecture, des banquettes ou des divans qui pourraient donner l'hospitalité aux visiteurs, et leur permettre de venir considérer vos œuvres. Autre trait de cet état d'indifférence créé par l'ignorance publique. Un rédacteur en chef, un directeur de revue ou de journal, fait venir un homme de lettres, un écrivain et lui dit:—

"Veuillez vous faire cette année le compte rendu du *Salon*!"

L'autre, qui a l'habitude du style et des développements littéraires, répond:—"Très volontiers; justement j'ai toujours beaucoup aimé la peinture."

"Ah! oui, c'est qu'il faudra aussi parler de la sculpture!"

"Oui, j'en parlerai à la fin, dans le dernier numéro. Par exemple, quant à l'architecture, vous savez, je n'y connais rien et je ne m'en suis jamais mêlé!"

Et le rédacteur en chef répond:—"N'en parlez pas, cela n'y fait rien, ça n'amuse pas le public, ce n'est intéressant pour personne."

Another phase of the relation between the architect and the public touched on by M. Ballu can also be only too well recognised in England. An architect is commissioned by a rich proprietor to design and superintend a large mansion; he has to consult all the special fancies of his client and of Madame; every day he has to listen to a new idea from the fertile brain of his client, and, consequently, every day the expenses increase. At last, the building is finished, and a person called the "decorator" is introduced, "qui s'appelle souvent 'architecte-décorateur,'" whose appearance is a signal for the architect to modestly withdraw, and who works his will there like an invader in a conquered country. At last the house-warming takes place, and every one is delighted:—

"Les amis complimentent le propriétaire: L'hôtel est ravissant, vraiment! Voilà qui est parfait! Qui est-ce qui vous a fait cela, mon cher?"

"Oh! dit le propriétaire, un tel; seulement, il n'y est pour rien, voyez-vous, c'est moi qui lui ai donné toutes les indications; il n'a fait que ce que je lui demandais!"

THE January number of *Murray's Magazine* contains an article by Mr. H. II. Statham on "Mr. Shaw-Lefevre as an 'Edile,'" mainly in reply to an article on "Public Works in London" contributed by that gentleman to the November number of the *Nineteenth Century*—an effusion which rather pointedly illustrates Lord Justice Bowen's recent characterisation of the *Nineteenth Century* as a periodical which had achieved a popular success "by getting persons who know one thing to write about another."

#### "THE NATURAL HISTORY OF LOCAL BOARDS."\*

THIS book, which does not bear its author's name on the title-page, is a reprint of an exceedingly lively and clever series of articles which lately appeared in the columns of our able contemporary, *Engineering*. It is an effective *exposé* of the manner in which many Local Boards have, through ignorance (which includes motives of fancied self-interest), either neglected their duties or set about them in a perfunctory and half-hearted manner, to the

great loss of the benighted ratepayers, not in money merely, but in health and life. Appropriately dedicated to Mr. Edwin Chadwick, "the venerable father of public health legislation," its appearance just now is most opportune, and we trust that it will be widely read, and its lessons deeply pondered, by the ratepayers who will be responsible for the election of the new County Councils a week or two hence. After graphically, and with much humour, depicting the follies and foibles (including under these heads petty local and party jealousies, false economies, and corrupt motives) which have actuated the Local Boards of whose "natural history" he treats, the author inculcates the self-evident, but none the less important, lesson, that just as Local Boards have been exactly what the ratepayers have made them, so the County Councils will be a reflex of the intelligence (or the stupidity) of the electors. Therefore he urges the ratepayers themselves to "seek wisdom"; then, he says, "wise government will begin." There is a great deal of force in his argument to this end, and ratepayers who will read this really entertaining and instructive book are certainly more likely to make choices of "fit and proper" candidates, because they will have a much clearer perception of the duties and responsibilities of members of local authorities.

We can quite believe the author when he says that the seven typical Local Boards whose doings he has sketched are "exact copies from every-day life,—nothing caricatured, nothing idealised," and that his book is "a mere chronicle of facts, which might almost be wholly compiled from published sources." The past volumes of the *Builder*, many Parliamentary Blue-books, and Government publications in great number and variety, bear witness to the fidelity of the author's sketches in many particulars, while the reports of Local Board meetings which are constantly appearing in the newspapers of all parts of the country (and which we are often called upon to read) testify to the small-minded, cheese-paring, penny-wise-and-pound-foolish (not to say corrupt) tendencies which too generally prevail,—often by dint of gross personalities. Who that is familiar with these things can wonder that gentlemen of capacity and integrity show a decided reluctance to take part in the management of local affairs, and that many voters will not vote at local elections,—which are too often controlled by wire-pullers in the interests of cliques of self-seekers and jobbers? In regard to the County Councils, we hope that competent men will not hesitate to come forward,—"men of affairs," "men of parts," practical men, men with large views and broad sympathies, and at the same time honourable men, and "men of the world" in the best acceptance of the phrase. Such men, as administrators, may learn many a useful lesson from the book under review.

The seven "specimens of natural history" of which the author treats are:—I. The Progressive Board. II. The Forcible Board. III. The Fighting Board. IV. The Experimental Board. V. The *Laissez-Faire* Board. VI. The Compulsory Board. VII. The Contentious Board." All these specimens, he assures us, "have been collected in a single valley, within the narrow limits of an area twenty miles long by ten broad, their little habitats or dominions almost touching each other." The author's "happy hunting ground," as we may call it, was and is situate somewhere in the West Riding of Yorkshire,—a district which on the surface is largely agricultural in its pursuits, but which has also, within the last fifty years, witnessed a considerable increase in the coal-mining and ironworking industries, as well as vast strides in the establishment and development of the mills of "weavers and spinners and sic-like mechanical persons," for whom and their pursuits Rob Roy expressed so much contempt, though his native Highland streams were certainly not dye-stained and polluted out of recognition as are the rivers of Yorkshire and Lancashire. Of course, it must be borne in mind that the great growth of industrial activity during the last thirty-five or forty years commenced just at the time when the science of sanitation, as we now understand it, was born. Comparatively small towns and villages suddenly found themselves to be centres of busy and growing industries; mills, factories, and foundries were multiplied, and many of these small towns and villages were soon more or less completely surrounded by new districts or "settlements," called into existence by the necessity of providing dwellings for the mill-"hands," colliers, and others. And such dwell-

ings! Built "back-to-back," without any building by-laws or other restrictions, without drainage (except into cesspools), and without water (except such as was to be had from wells in immediate contiguity to the said cesspools). In the chronicle of the doings of the "Experimental Board," one humorous ratepayer is reported to have said, with grim irony, "We are true water-savers; where I live we have nothing to do but empty our slops into the ash-pit, and we drink the water over-and-over again." Very appropriately, this continually-recurring process of transmutation occurred in the "Drinkblige Union" (Of course the actual names of the villages and townships mentioned are disguised by some more or less appropriate appellation). What wonder that under such conditions as these the inhabitants of such industrially-prosperous new townships soon became the prey of epidemics! Need it be said that, in spite of much sickness and mortality, the poor people were for a long time helpless? The General Board of Health had only then just come into being, and the Public Health Act of 1848 had hardly become operative anywhere. But after the lapse of a few years, when overcrowding and general insanitary conditions had brought in their train small-pox, typhoid, and other fell destroyers and disablers, it began to be evident to the most supine of people that "something must be done." It was discovered that the inhabitants had the power to petition for the formation of Local Board Districts, and Local Boards were constituted and elected one after another in rapid succession. But many of them, out of a desire to "keep the rates down," distinguished themselves by their dilatoriness, and became adepts in the art of "how not to do it," to the ultimate augmentation of the rates to a degree that would otherwise have been unnecessary.

We are told in this veracious chronicle that "the early engineering of Flatthorpe was more economic than scientific," but that the Flatthorpe Local Board (this was "the Progressive Board") learnt wisdom from their errors, for, of course, engineering that was not "scientific" did not prove to be "economic" in the long-run. This Board had an able and energetic member (who afterwards became its Chairman) in the person of one "Mr. Strong-boy," who may be said to have "discovered" a young and able engineer to serve the Board. The Chairman and other members of the Board had great confidence in the judgment of this young engineer, and on the whole their confidence was not misplaced. In the result, after suffering much at the hands of incompetent contractors, the sanitary needs of Flatthorpe were provided for, and with such success that the death-rate was reduced from 22.5 to 16.5 per thousand. Flatthorpe, it should be said, was the industrial offspring of Miryfell, but Miryfell scouted the idea of doing anything for its progeny in a sanitary point of view, and it was consistent enough to do nothing for itself: it "wanted no local government," it said. But directly Flatthorpe had, by self-help, demonstrated that a sanitary policy was the truly economic and advantageous one to adopt, Miryfell and an adjoining township, "St Paul's," craftily promoted a scheme for annexing the now flourishing and healthy descendant of Miryfell. This cool project was, after an active fight before the Local Government Board's Inspector, defeated. The annals of the "Forcible Board" (whose domain was named Bleakheights) had a vigilant Medical Officer and an Engineer of such ability and force of character that, though his Board were inclined to resent his masterful demeanour, they were very glad ultimately to profit by it when he succeeded, as the narrative explains, in "bearding in his den" no less august a personage than a certain noble lord (now deceased) who, as Chairman of the House of Lords' Standing Committee on Private Bill Legislation, ventured with characteristic capriciousness to criticise "the Bleakheights Improvement Bill." On the Board's engineer lay the burden of proving the case for the Bill, which he did so effectually that the Bill became an Act without much further hindrance from the restrictions of red tape. Of the "Fighting Board," and its heavy costs and losses through litigation; of the "Experimental Board," with its ludicrous triune official who was at once Clerk, Surveyor, and Engineer to the Board, and its long, abortive, and very costly water scheme; of the "*Laissez-Faire* Board," whose policy of "masterly inactivity" was tempered by corruption; of the "Compulsory Board," and of the "Contentious Board," we cannot speak at length.

\* The Natural History of Local Boards; or, Local Government as it is: A Manual for the Use and Direction of those whom it may concern; and especially for Legislators, Administrators, and Ratepayers. London: Simpkin, Marshall, & Co. 1888.





Farm-House, Reymerstone, Norfolk.

One point strongly brought out in more than one of the author's "studies" is the absolute necessity, in the interests of economy and efficiency, of observing the old proverb, "*ne tutor ultra crepidam*." The Board who appointed a schoolmaster as its Clerk found by bitter experience that while his minutes and accounts were unexceptionable, his Law was very dubious, to say the least. The network of difficulties in which the Board with a sort of "three-branch-hand" official (already referred to) involved itself, is amusingly depicted by the author. Another point which is strikingly demonstrated is the really (in the end) extravagant conduct of those Boards who seek to acquire the services of a competent Surveyor for a mere pittance. How costly some of these "economies" prove is clearly shown in this "natural history" of what we would fain hope are soon to become extinct species. The "Experimental Board," for instance, who were charged with the sanitary well-being of a population of 5,000, appointed "a Surveyor and Nuisance Inspector" at a salary of 26s. weekly, "at about which time," says our chronicler, "a ratpayers' association was formed . . . to keep their extravagance in check." (!) It too often happens that the men who accept these appointments are men who would be dear at any price. The fancied "saving" in their salaries is often swallowed up many times over by constructive and sanitary blunders. As the author truly remarks, "Like a watch, the engineer is difficult to get to work well in little space at a little price; and when they do get him, by some miraculous chance, few Boards know they have him till he is gone." Unfortunately, such wretched pay for services upon which the life and health of ratpayers largely depend is still being offered. As a case in point, a recent number of the *Builder* contained an advertisement for a Borough Surveyor, whose duties were "to include the supervision and maintenance of the streets and highways within the Borough, the charge of the waterworks, sewers, and land." The salary for this responsible work was to be "£90 per annum" (!) In consideration of such princely remuneration, "the person appointed" was "required to devote the whole of his time to the duties" of the office. Where, as the author pertinently asks, should not there be "a power of departmental veto over such appointments?" "Does not the public good demand such a veto?" Undoubtedly it does. A good Board, as the author remarks, "will appoint an Engineer who, with the destinies of water and drainage in his hands, carries with them the good or evil

fate of thousands; who, while contending with the blind forces of the elements, has to contend with other foes more deadly,—the caprice of his masters, and the cupidity and neglect of his contractors; and who, in the realisation of great sanitary principles, should be the hand and brain of the Board, the generalissimo of the little sanitary army. Him they will select for his experience and the victories achieved by him over the common foe. It should never be forgotten that buying the service of good engineers, the public are not dealing with brokers. 'It's no herrings ye're buying; it's men's lives,' said the fishwife to Scott's 'Antiquary.' So do engineers sell their lives with their work. The professional death-rate reveals this secret."

Another point which strikes us as being clearly demonstrated in the book (though the author does not seem to lay special stress upon it), is the necessity of some controlling and regulating power over "watershed areas." Although the "triple alliance" concluded by three of the Boards mentioned for a common water-supply forcibly illustrates some of "the snares of federation for local purposes," the conflict of local authorities with each other in their scrambles for water for their growing populations is unseemly and impolitic,—impolitic because it often results in gross injustice.

#### FARM HOUSE, REYMERSTONE, NORFOLK.

This house, of which an illustration is appended, was erected last year for Mr. C. Arthur Cooper on the site of the old clay-lump building which had fallen into decay. It contains, on the ground-floor, parlour, living-room, kitchen, dairy, cellar, stores, &c.; and on the chamber-floor four spacious bed-rooms. The idea was to provide a useful and comfortable farmhouse, supplied with the most approved fittings, and then to design the building (which stands in the midst of charming rural surroundings) in keeping with the quiet, simple brick cottage architecture of the district. Mr. George J. Skipper, of Norwich, is the architect, from whose plans also a portion of the farm premises has been rebuilt. Mr. R. Mayes, of Dereham, was the builder.

**Stonehenge**.—At a recent meeting of the Oxford Architectural and Historical Society, held in the Ashmolean Museum, Oxford, an interesting lecture on Stonehenge was given by the Keeper of the Museum, Mr. Arthur J. Evans, M.A., F.S.A. A full report of it appeared in *Jackson's Oxford Journal* for the 15th inst.

#### THE CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

ON Saturday, December 22, the sixteenth year and forty-eighth term of this School was closed by the meeting held in the South Tower of the Palace. Mr. J. W. Wilson, the Principal, stated that the school had opened with eight members, and had increased continuously. They were closing this term with seventy-seven students, being six more than in the preceding term. Since its opening, 742 students had passed through the school, who were now dispersed all over the world, doing good work, as far as they could be traced. Some had given up the profession, but many of the past students had revisited the old South Tower with a good record.

Mr. James Mansergh, Member of the Council of the Institution of Civil Engineers, presided, and presented the certificates awarded to the students by the Examiners, Messrs. W. H. Holtttam, A.M.I.C.E., M.S.E., and J. J. Talman, A.M.I.C.E., F.G.S.

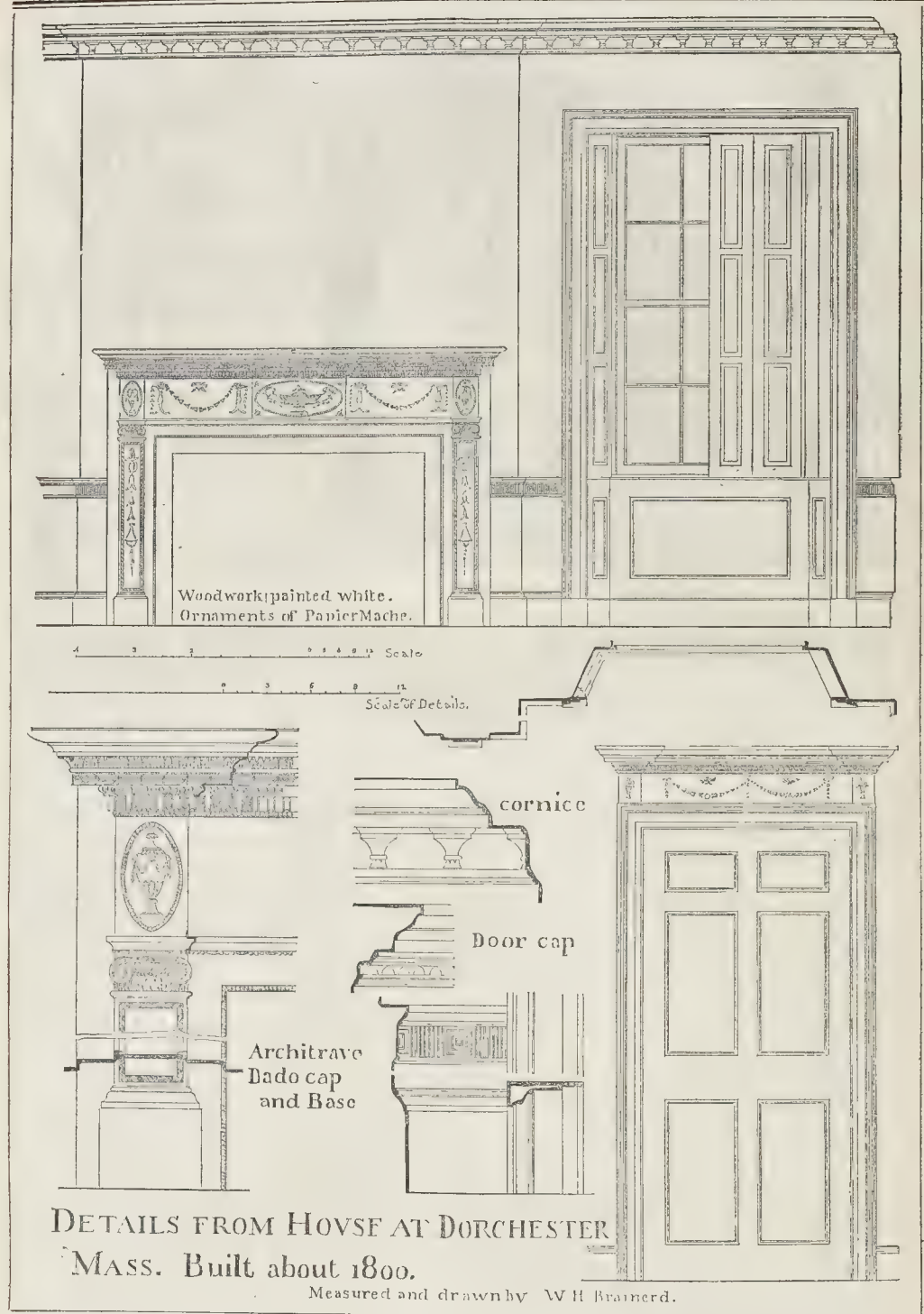
Mr. F. K. J. Shenton read the report of the Examiners, after which

Mr. Mansergh addressed the students. He expressed his pleasure in being enabled to discharge the honourable function entrusted to him, which he had been unable to do when invited on previous occasions. He heartily congratulated the directors and Mr. Wilson, the Principal, and his staff, upon the continued and deserved success of the School. He was able to contrast the state of technical education with what it was at the end of the forties, as compared with what it was in this school at the end of the 'eighties, and could assure the students that things were very much in their favour. After some advice as to the necessity of industry in making the most of their advantages, Mr. Mansergh gave some interesting illustrations of his experience in railway surveying and construction in Brazil, showing the practical value of the course of instruction given in the Colonial Section, in relation to qualities of timber, methods of quarrying, excavating, and various other matters. The course of instruction in the Colonial Section was an excellent illustration of the kind of technical education that best fitted a man for the work with which he had to make his way in life; in that school they had a training that would adapt a man for many vocations. He could not too strongly urge the importance of attention to the mechanical part of the course, to the acquisition of personal ability to execute with the hands as well as to devise with the head. He impressed them also with the importance of their studying the principles of geology, including hydro-geology, micrology, and chemistry,—all essential to the thorough engineer. They would do well also to guard against slovenliness, grammatical inaccuracies, or carelessness as to neatness, exactness, and finish in their drawings or writing. The art of photography was well worth the attention of young engineers, and they would do well to master it, and those going abroad would find it of great advantage to take an equipment of photographic tackle. As a final word, he would urge his young friends to be honest at all costs. The time had been when an English brand had been received throughout the world as a sufficient guarantee of honest quality; that time, unhappily, had passed. He hoped his young friends would do their parts in their several spheres to restore, in so far as in them lay, the character of their country.

Mr. Mansergh then proceeded to present the certificates. The lecture for the term was on "Materials and their Manufacture." Thirty-eight students attended the lectures; 30 were eligible for examination; 22 passed satisfactorily and were awarded certificates. The highest number of marks attainable was 268. P. B. Motley was first, with 242 marks; he was also second in the order of merit for work in the fitting-shop; B. Caramuru was second for lecture examination, with 239 marks, and first for work in the fitting-shop.

In the Drawing-Office, twelve certificates were awarded; W. G. Wales, first; W. H. Vipan, second. In the Pattern-Shop there were ten certificates awarded; E. M. Proes and A. M. A. Struben, equal firsts. In the Fitting-Shop ten certificates were awarded; the first and second are named above.

In the second year's course,—Civil Engineering,—five certificates were awarded to students of the first term, for general surveying, and the preparation of plans and estimates for Parliament. D. A. Andrus and F. S. Springett were



equal firsts. To students of the second term nine certificates were awarded for calculations, plans, and estimates for a railway and dock,—C. A. Angus, first; A. W. Pearson, second. To students in the third term three certificates were awarded, for design and construction of existing and other engineering works,—J. S. Lea, first; D. A. Symons, second.

Four certificates of the first grade were awarded to students in the Colonial Section for examination in "Scientific Means and Resources"; these were C. M. Fothergill, J. A. Fairbairn, E. F. Bosanquet, and P. H. Woolls. T. W. Hammer was awarded a certificate in the Marine Engineering Section.

Votes of thanks concluded the proceedings.

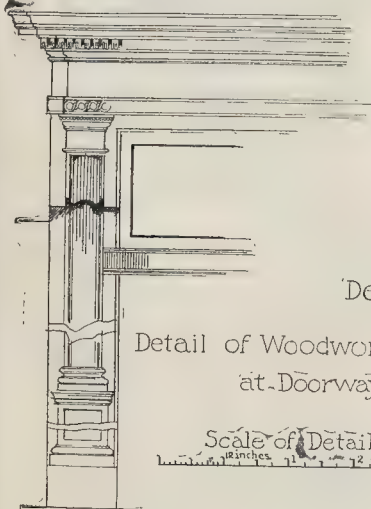
#### DETAILS FROM HOUSE AT DORCHESTER, MASSACHUSETTS.

THIS illustration furnishes an example of the manner in which what may be called the "Adam" style was reproduced in the latter part of the last and early part of this century in domestic buildings in America. It will be



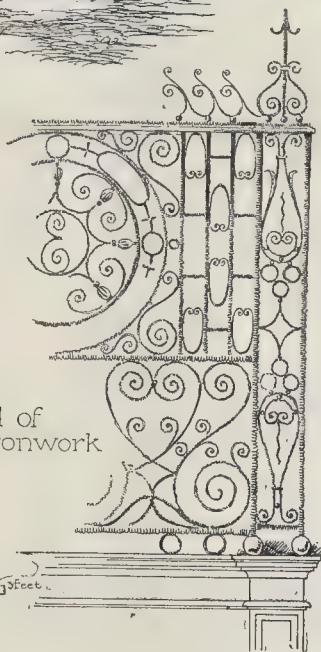


Old Colonial Entrance  
Legré Street.  
Charleston S.C.

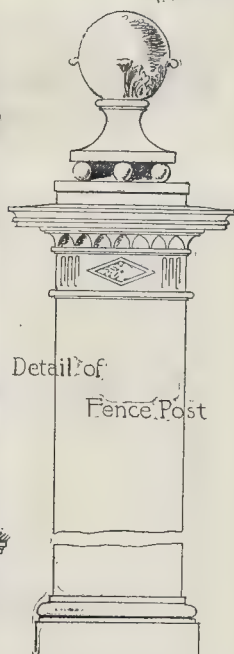


Detail of Woodwork  
at Doorway

Scale of Detail  
inches 1 2 3 4 5 6 7 8 9 10 11 12



Detail of  
Ironwork



Detail of  
Fence Post

seen that the details are precisely adapted from the style worked out by the brothers Adam in this country; indeed, they might well have been supposed to have come from the neighbourhood of the Adelphi.

**Erratum.**—In "Notes" in last week's *Builder*, p. 448, col. 2, line 6, for "forms" read "towns."

#### OLD COLONIAL ENTRANCE, CHARLESTON, SOUTH CAROLINA.

This is another example, though not in by any means so pure a style as that given on the preceding page, of the reproduction, in the earlier days of American history, of the late Renaissance style of the eighteenth century as developed in

England. The greater proportion of work of this class is to be found, we believe, in one or two of the Northern States, in the part of the country formerly spoken of as "New England," especially in the States of Pennsylvania and Massachusetts. This is a Southern example.

This and the other illustration from Massachusetts are from a series of drawings of this



class of American architectural detail, originally made for the New York journal now known as the *Engineering and Building Record* and *Sanitary Engineer*, which formerly circulated under the title of the *Sanitary Engineer and Construction Record*. This journal, which is known probably to some of our readers as a very ably-conducted paper dealing chiefly with sanitary subjects, has for some little time past added to its more practical programme the production also of illustrations of modern American domestic architecture regarded on its picturesque side. As these are probably known to but few of our readers, and include a great many examples of that modern development of the picturesque house architecture to which the American architects have imparted a character and manner of their own, we have arranged for the republication of a selection of these sketches, which will appear from time to time in our pages during the next year.

### Illustrations.

#### WEST WINDOW, CHAPEL OF THE THEOLOGICAL SEMINARY, NEW YORK.

**T**HIS window has been designed and executed by Messrs. Lavers & Westlake, for the Chapel of the New Theological Seminary at New York. The lower compartments show the Flood, the Burning of the Cities of the Plain, the Passage of the Red Sea, and the Fall of Jerusalem. The upper compartments represent the history of our Lord's Passion.

Mr. Westlake informs us that it was stipulated, when the commission was given for the window, that the style of the design was to be "Modern" (i.e., we presume, not sham Medieval), an instruction which is creditable to the artistic sense of those who gave the commission.

The east window subjects show the triumph of Christ and the final reward of the faithful; and the eight windows on the north and south illustrate events in Old and New Testament history. The windows appear to have been much admired in New York.

Some further description of this chapel, on which no little cost and care seem to have been expended, may interest our readers. We take the account from one published recently in the New York paper, the *Churchman* (making a little allowance, of course, for the writer's evident enthusiasm):—

"The Memorial Chapel of the Good Shepherd was erected by the mother\* of the present dean as a tribute to the memory of her late husband, Samuel Verplanck Hoffman, of New York.

The chapel stands in the centre of Chelsea-square (the seminary block), between the east and the (proposed) west quadrangle. It is built of brick and red sandstone, and, like the rest of the seminary buildings, is of the style known in England as Collegiate Gothic. The architect, Mr. Charles C. Haight, has thoroughly mastered the spirit of this style of architecture, and the visitor is reminded of one of the college "quads" in Oxford or Cambridge.

The chapel is 101 ft. 7 in. in length, by 43 ft. in width, and is 78 ft. in height to the ridge of the roof. The tower, which resembles in its lines the far-famed tower of Magdalen College, Oxford, is on the south-eastern side of the chapel, looking towards Ninth Avenue. It is 25 ft. square, and rises 160 ft above the sidewalk. It has a battlemented roof, and is to be provided with a noble chime of bells.

The entrance is from the seminary grounds, through two large double oak doors, under a heavily-moulded single arch. The tympanum over the door is to have a bas-relief of the Good Shepherd carved in stone.

The visitor, upon his first entering, is struck with the lofty open chestnut roof, the chaste marble inlaid mosaic pavement, the magnificently-carved rood-screen surmounted by its choir of angels; the beautiful brazen gates, the solid oak stalls, the richly-stained windows, and the exquisite alabaster altar and reredos.

The ante-chapel will afford seats for about one hundred visitors. The rood-screen, which marks the line of division between chapel and ante-chapel, was made by Ellin & Kitson, and is of richly-carved quartered oaks, resting on a solid stone base. It is the finest thing of the kind in this country.

Within the screen on either side are four rows

\* Mrs Hoffman died February 18, 1888, before the chapel was completed.

of stalls for the faculty, fellows, clergy, and students. The stalls for the dean and sub-dean are canopied. Above the stalls, on a stone band extending the whole length of the chapel, within reach of the eyes of the students, are carved the words of the Ordinal:

Accipe Spiritum Sanctum in Officium et opus Sacerdotis in Ecclesia Dei, per Impositionem Manuum Nostrarum jam tibi commissum. Quorum remiseris peccata, remittuntur Eis. Et quorum retinueris retenta sunt. Esto etiam fidelis verbi Dei, et Sanctorum Ejus Sacramentorum Dispensator: In Nomine Patris, et Filii, et Spiritus Sancti, Amen.

The floor throughout is laid in rich marble mosaic, made in Paris, under the direction of William H. Burke, of this city. The prevailing tone in the ante-chapel is white with a richly coloured border. In the choir the tone of colour is a soft yellow, with interlacing quatrefoils enclosing the names of the Christian virtues in the following order (beginning at the west end):

|               |       |
|---------------|-------|
| Fortitudo.    | Spes. |
| Justitia.     |       |
| Temperantia.  |       |
| Prudentia.    |       |
| Misericordia. |       |
| Humilitas.    |       |
| Caritas.      |       |

The colour around the altar is red, with rich diaper patterns, the place of the officiating priests being designated by quatrefoils with elaborate designs. The seven steps leading to the altar are of highly-polished Italian dove-coloured marble. The organ, which was specially made by Roosevelt, is placed in the second stage of the tower, opening into the chapel by a large arch filled with richly-diapered pipes. The key-board is brought down to the level of the stalls.

Lastly comes the exquisitely-carved altar and reredos (20 ft. wide and 16 ft. high) built by Fisher & Bro., of this city, of the purest English alabaster, brought from the royal quarries especially for this purpose. It is believed to be the only reredos of this material in this country. Nothing can exceed in beauty the richly-variegated tints of this exquisite piece of workmanship. The altar-slab, which (as well as the arches of the reredos) is supported upon pillars of red marble, is of white marble with five inlaid crosses in red. The reredos has ten niches, which it is proposed to fill at some future time with appropriate figures. On either side of the reredos there are five arched recesses, in which are cut in brown stone the names of deceased professors, each professorship having a distinct panel appropriated to it."

#### HEXHAM ABBEY.

BOTH our illustrations from Hexham Abbey Church, viz., section through transepts, looking east, and the painted screen, are from drawings by Mr. C. Clement Hodges, whose recently-published monograph of the Abbey forms the subject of our leading article this week.

#### DESIGN FOR SUNDERLAND BOARD SCHOOL.

THIS is a perspective view of a building submitted in competition for a new graded school for the Sunderland School Board, to accommodate 380 boys and 320 girls. The building has been treated with a view to future extension, and is of simple character, the materials being plain red brick with stone dressings, and was one of those selected for final consideration by the committee. The design is by Messrs. Mitchell & Butler, of London.

#### PROPOSED ERRINGTON MEMORIAL TOWER, COLCHESTER.

THE memorial tower of which an illustration is given was designed for the late Mr. George Errington, of Lexden Park, Colchester, a well-known banker of that town, who proposed to erect it at his own expense on the site of a church (St. Runwald's), which had been recently removed from the High-street. In this position the tower would stand near the Old Moot Hall, which is shown in the background of the view, though this building was replaced some forty years ago by a new Town-hall, which is already in a decaying condition.

The chief feature was to be a large illuminated clock with chimes, and the whole was to be surmounted by an allegorical figure representing the light of Christianity. At the base the sides and angles were to be adorned with sculpture illustrative of the history of the town. Unfortunately, Mr. Errington did not

live to carry out his good intentions, though the design (completed under his own personal instructions) was ready for execution at the time when he became too ill to make arrangements for its being carried out after his death as intended. The height was to have been not less than 80 ft., and the cost from 1,500*l.* to 2,000*l.*

In connection with the subject, some further remarks on the matters of antiquarian interest connected with the site may not be out of place.

Any one referring to the plan of Colchester in the valuable little volume published by the Rev. E. L. Cutts, under the editorship of Dr. E. A. Freeman and Mr. W. Hunt,—one of the series of "Historic Towns," and, indeed, one of the most important of them,—will notice in the very centre of the High-street, which runs east and west through the heart of the town, a spot indicating the position of St. Runwald's Church.

For many years an agitation for the removal of this building was kept up, till at last the street was cleared of what was then thought an encumbrance. And, indeed, the church appeared to be "in the way," but the street had adapted itself in width to the existence of the building, and when it was cleared away, it was not quite so clear to some of the parties who had wished it removed that it had not better have remained. If, for instance, the little church had been made to show something of its original external beauty,—the cement removed and the turret properly finished as it had been at first,—it might have been found quite worthy to exist as a central ornament to the town. However, it is gone, like the market-cross before it, and it was to place something monumental, but not obstructive, in its place that this clock-tower was designed.

But there were many little churches in Colchester, and one less of the many antiquities of the town was not much thought of compared with the opening up of the High-street.

Yet, with all this, the townspeople have allowed the chief end of the same grand street to be blocked up for ever against extending westwards by a great clumsy water-tower, which has been nicknamed "Jumbo," but not out of affection so much as for its heavy proportion and immense size. So one generation builds up while another pulls down.

A further example of the architectural loss the town has suffered in recent times is the Moot Hall (shown in the view as it appeared in its last days), for it was originally a work of the Norman period. Some parts of the old walls remain even now incorporated with those of the Town-hall. This building is referred to in Mr. Cutts's book, as also the Market-cross, which stood nearly opposite it, as shown in Speed's map. If it were like the cross at Chichester and elsewhere, such a "restoration" would even now be a valuable object of interest,—even more monumental, perhaps, than this clock-tower.

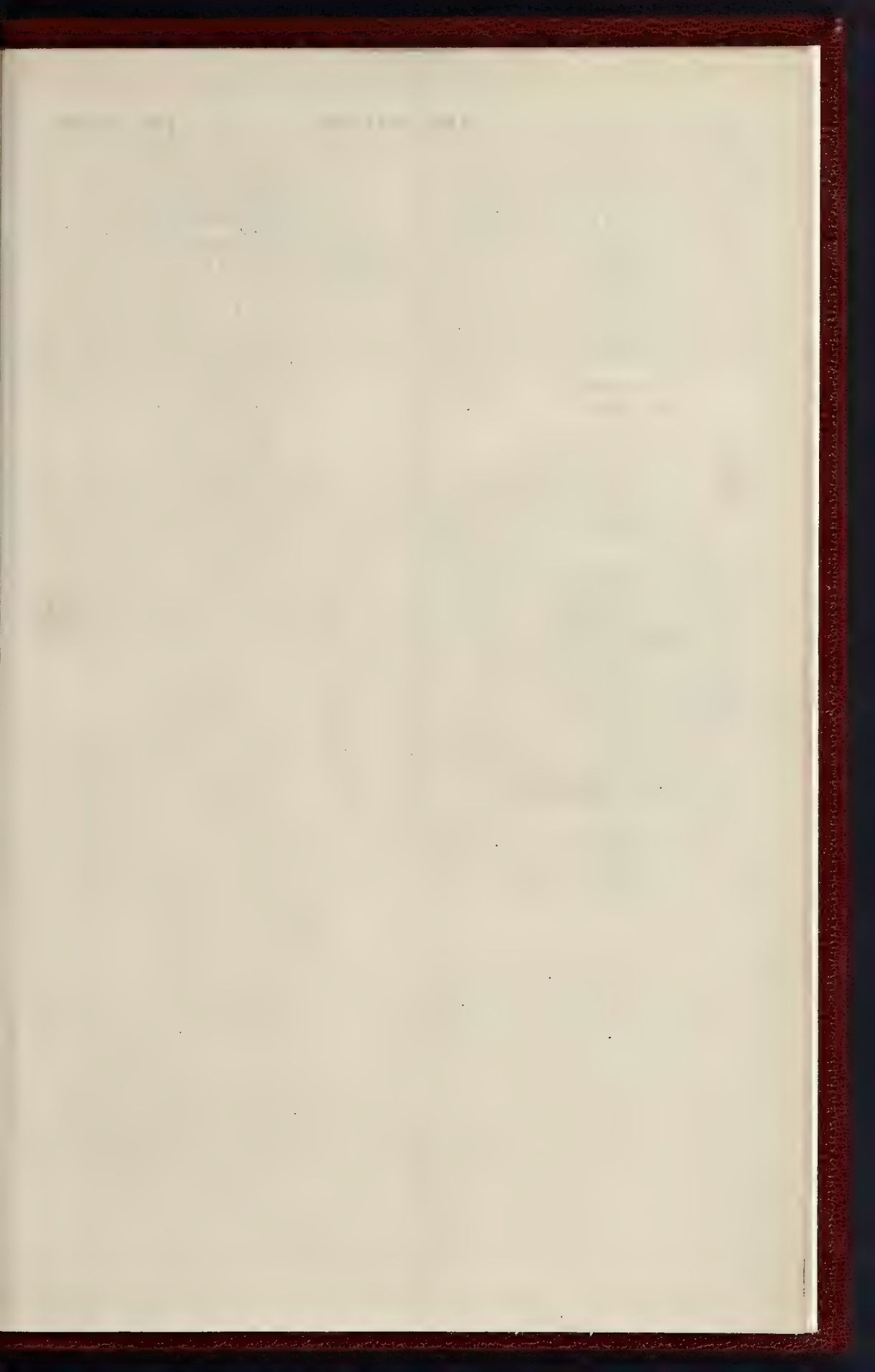
Of this "Moot Hall," it is said, "As the Lord of the Manor had his *Curia*, so the community of burgesses had its Moot Hall; and tradition assigns its erection to Eudo, who held the office of 'Dapifer' to William the Conqueror, and was a frequent resident in Colchester."

During the siege of Colchester, such damage was done to the various buildings that they have not all been made good to the present day. Guns were planted on the church towers, notably at "St. Mary-at-the-Walls,"—where was a specially obnoxious gunner, who was only silenced by the knocking over of himself, gun, and tower together. Probably other churches themselves, such as St. Botolph Priory, St. John's, or what remained of them at that time, were further ruined, as well as many old edifices of which we have scant records.

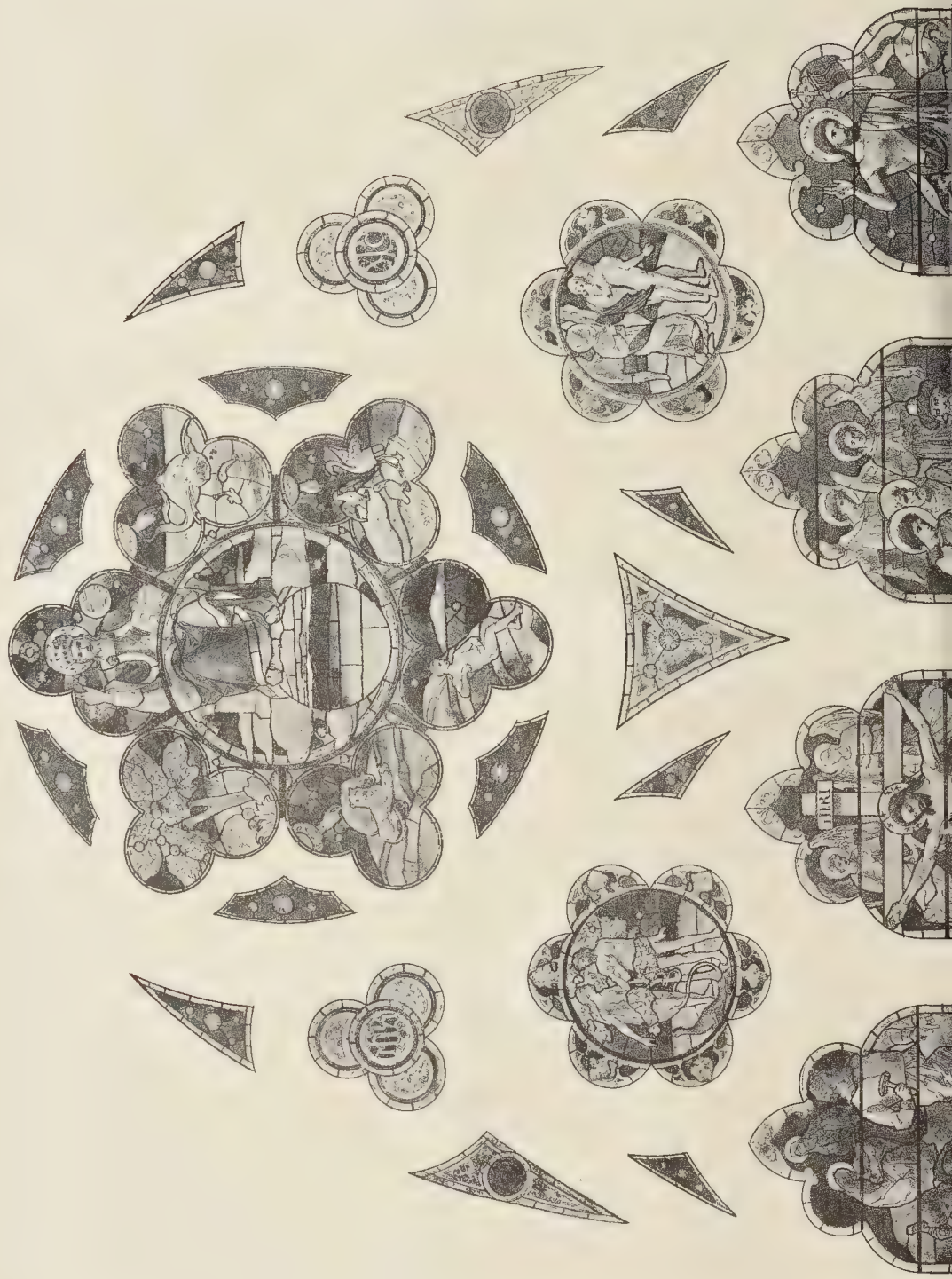
The Castle itself, however, the chief glory of the town, remains very much as it was left,—speaking comparatively,—after the siege of 1648. All the town gates, though, have nearly disappeared, excepting two. The oldest of all, however, remains, a real Roman entry into the town through the original wall,—from the west at the top of the Balken Hill; and the old walls of the town are traceable throughout, and, of course, many tessellated pavements have been found at various times. This little volume may be commended to the architectural student as a small latch-key to the antique history of Colchester, but not by any means as an exhaustive account of what may be found even in modern Colchester of the ancient Camulodunum, or of more recent periods in the history of the town.

C. FORSTER HAYWARD.

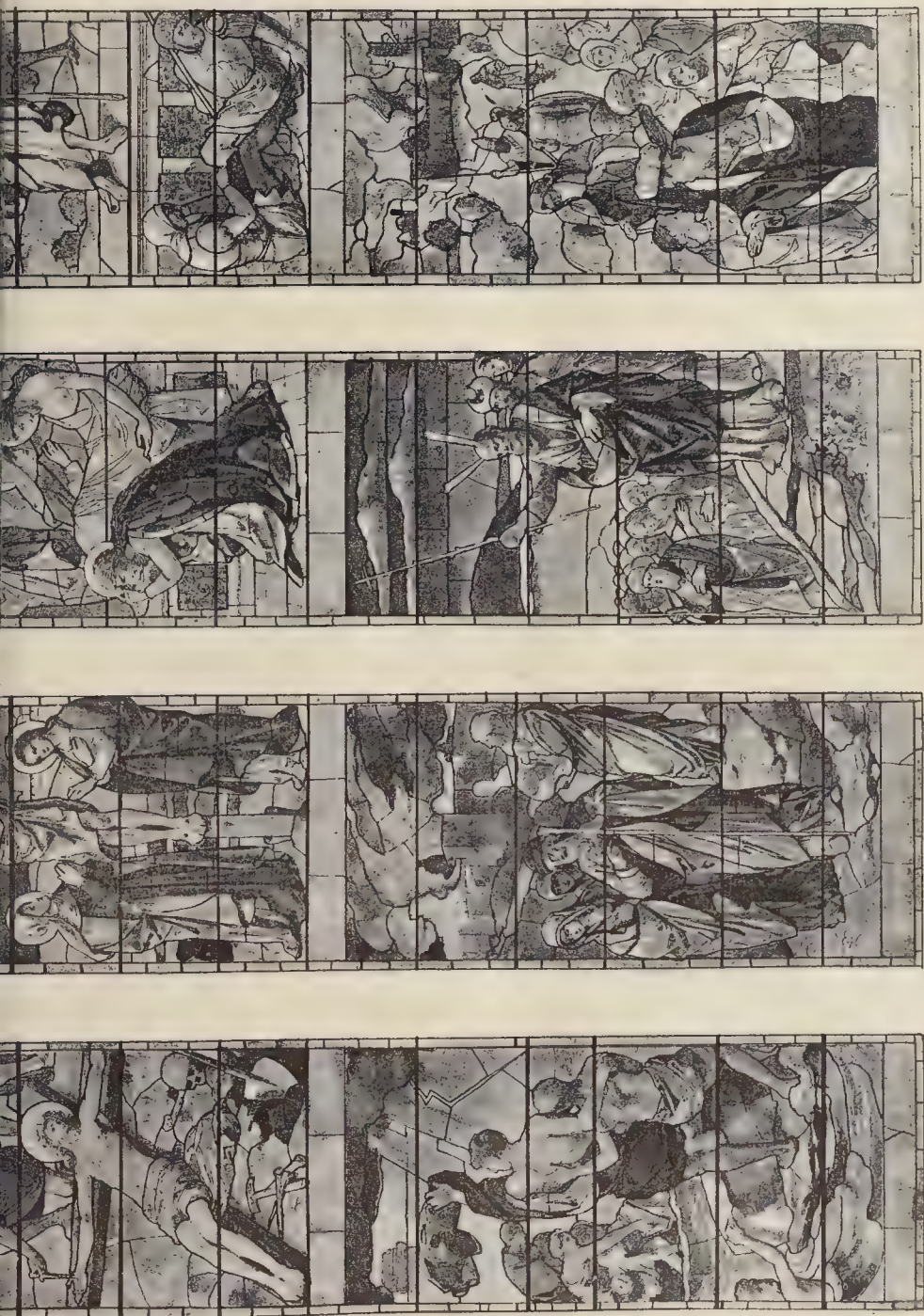




THE BUILDER, DECEMBER 29, 1888.







THE WEST WINDOW OF THE "THEOLOGICAL SEMINARY," NEW YORK.—DESIGNED BY MESSRS. LAVERS AND WESTLAKE.

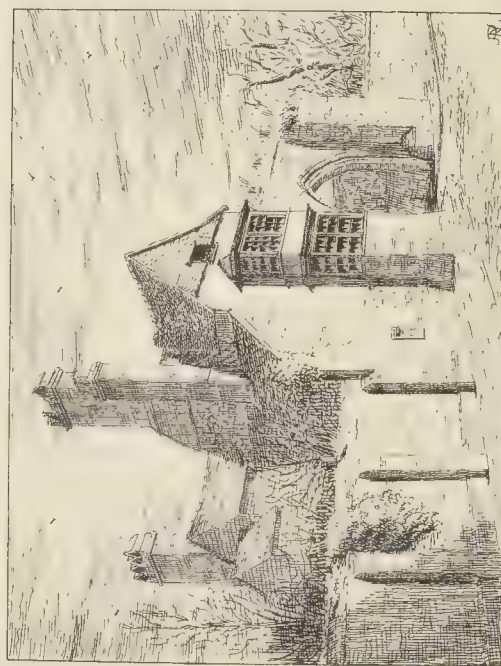




TARNHAM ROAD, GUILDFORD



ON THE MOUNT, GUILDFORD



CASTLE ARCH



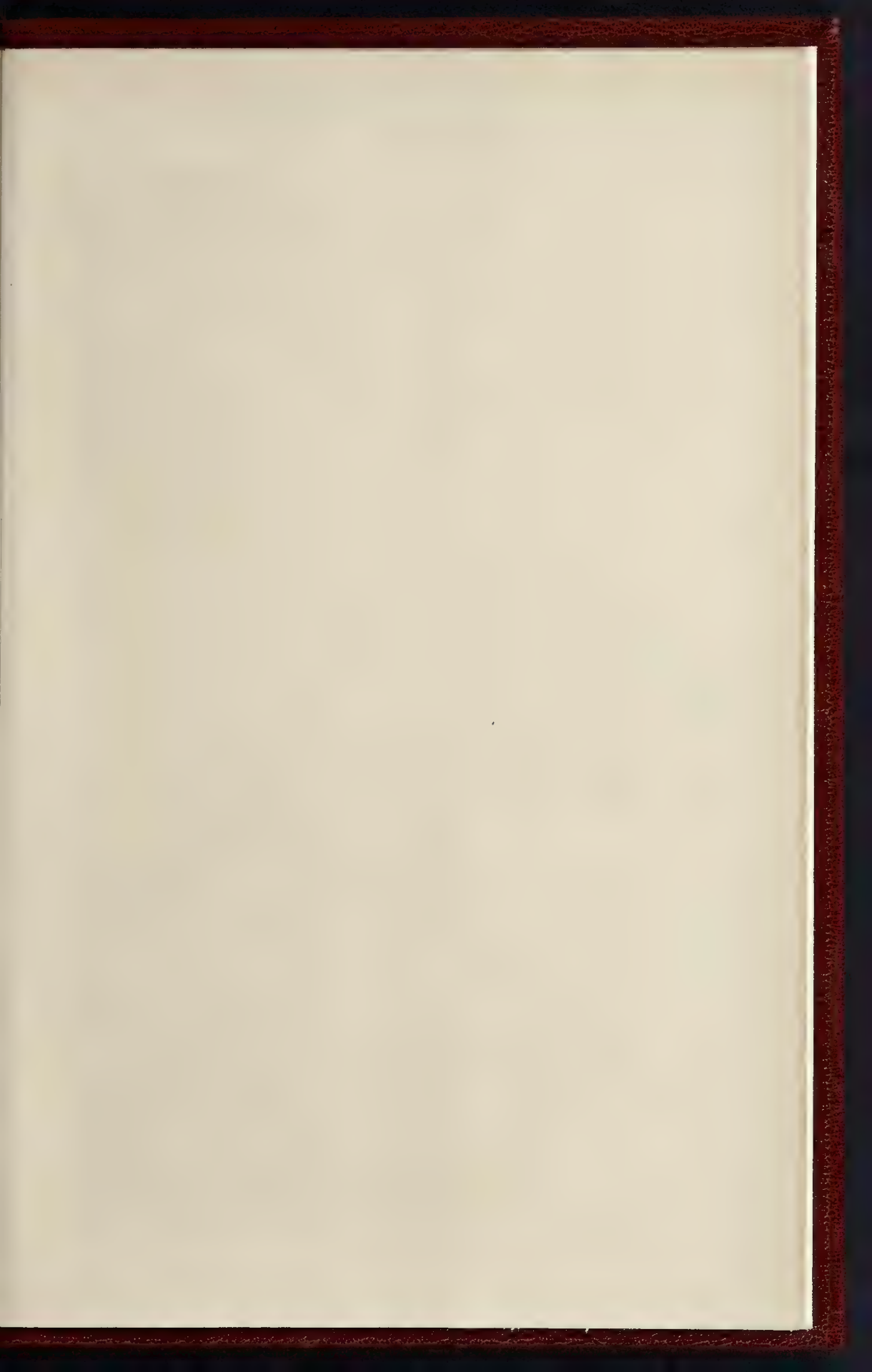
IN THE MEADOWS











THE BUILDER, DECEMBER 29, 1898.

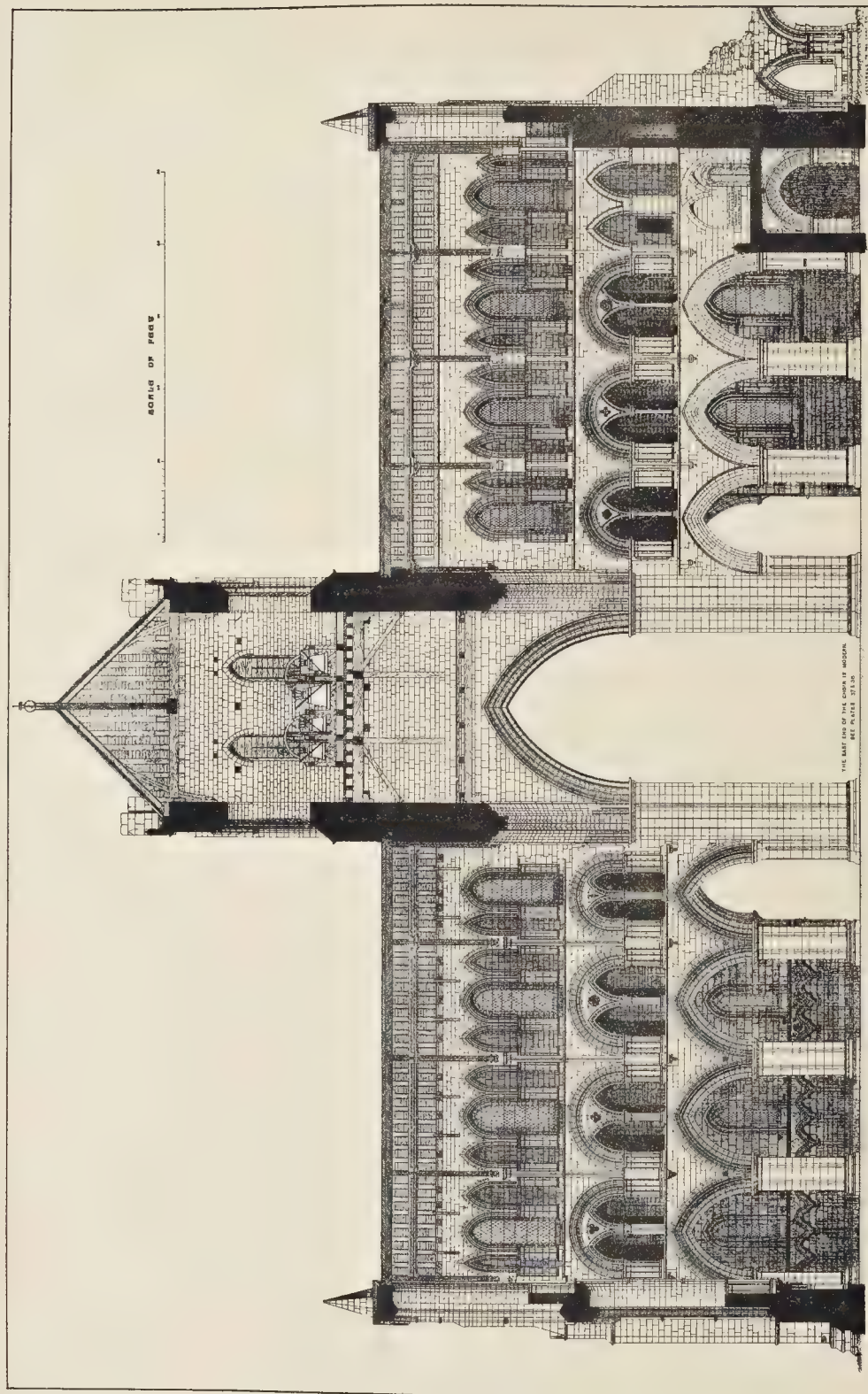
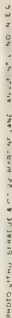


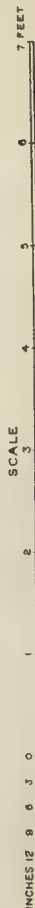
PHOTO LIND, SPRAGUE & CO. 22, MARK LANE, LONDON, E.C.

HEXHAM ABBEY: SECTION THROUGH TRANSEPTS, LOOKING EAST.—DRAWN BY MR. C. CLEMENT HODGES.





HEXHAM ABBEY: THE PAINTED SCREEN.—DRAWN BY MR. C. CLEMENT HODGES.







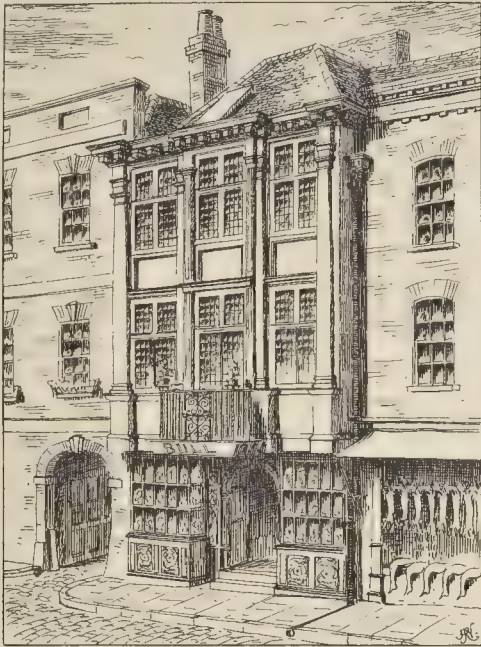


ERRINGTON MEMORIAL CLOCK TOWER FOR COLCHESTER.

MR. CHAS. FORSTER HAYWARD, F.S.A., ARCHT.







Nº 25 HIGH STREET GUILDFORD



GARDEN FRONT Nº 25



WOODBIDGE ROAD GUILDFORD



QUARRY STREET





## OLD COTTAGE ARCHITECTURE, No. IX.

A VERY favourite feature in old cottages is the lead quarry glazing, and it is a feature that has been seized upon and reproduced perhaps more than any other. Of its picturesqueness, both outside and in, there can certainly be no doubt, and when it is executed, as in modern work, with stout-cored lead and with the glass firmly cemented in, there is no objection on the score of comfort. The old quarries, however, were put into very flat and weak lead, and though I believe they were originally, sometimes at least, put in with a putty of wood-ashes, this has certainly washed away, and in consequence the windows fail to keep out wind and rain. Unfortunately, the post of properly-made lead-lights comes to about five times that of ordinary glass, and rather more than plate-glass, so that it must be regarded as an æsthetic luxury.

The two principal varieties of glazing in the Guildford district are the square and the diagonal. There are very few other patterns used. The diagonal appears to have been universal at early dates, and the square almost so at a later period. Of their relative merits, I should say that the effect of the diagonal is perhaps equal

glass," under the impression that this is "high art." "Cathedral glass" is a horrid material, to begin with, though it may have its use where it is necessary to obscure light, and the collection of pink, blue, green, and yellow squares, jumbled together haphazard, is about as vulgar a production as is often to be found.

The iron casements to which the glazing is fastened present a great variety of good work in the way of handles and uprights on the bottom piece for the purpose of pulling the casement to. These latter are often, and probably normally, pierced with a hole for the hook that forms the stay bar.

The most elaborate series of window ironwork of which I know is to be found in the fine old house, No. 25, High-street, Guildford. Of three of these handles I give illustrations drawn to scale (Fig. 2). All the arrangements are not quite perfect, as the handles are now only dummies, espagnolette fastenings having been adapted to the windows.

I show also the three pieces on the bottom bars belonging to these handles, numbered from the top (Fig. 3). This ironwork is, of course, of unusually elaborate character, but nearly every old cottage of early date has some good form of scroll handle. The flattened scroll shown in

point about this ironwork that has not received due attention. All hinges and such fittings were originally tinned; and where a house has been well preserved and tenanted, the tinning remains perfect to this day; in cases of neglect more or less rust has eaten through. This tinning gives the metal work a pleasant colour, not out of harmony with the old oak. But modern reproducers of "Gothic" ironwork have turned out their specimens finished a dull black, which is, of course, "impossible" for internal use, and is one of many similar things that have brought discredit on "Gothic."

The larger hinge, B, in Fig. 4, is of a very interesting pattern. It is generally taken to be founded on a cock crowing, and the pattern is Classic, and of great antiquity. In "Archæologia," vol. I, pl. xxv., is a drawing of the remains of an iron-bound bucket dug out of an undoubted Anglo-Saxon tumulus. The handles of this have ends of the same motive as those of this hinge, and the interesting question arises whether the form is a survival from Roman times to the seventeenth century, or whether the form was again introduced at the Renaissance. I had both these patterns reproduced some years ago at Birmingham, and I see they now figure in some of

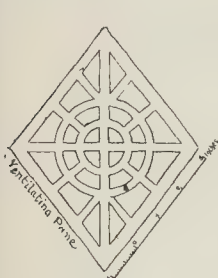


Fig. 1.



Fig. 2.

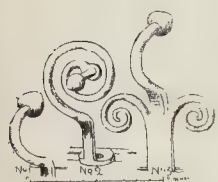


Fig. 3.

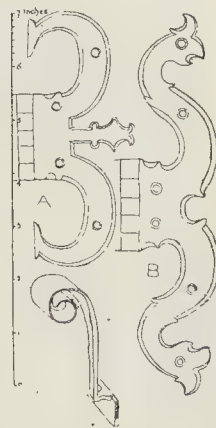


Fig. 4.

to that of the square externally, and may be preferred by some, but it must be remembered that it always looks better on drawings than in buildings. The inside effect of the diagonal will, I think, be generally voted unpleasant, from the distracting effect of the lines. With regard to the shape of the quarries, it must be noted that they are never drawn with an angle of sixty degrees, as is commonly enough done in bad modern work. Nothing can be more unpleasant than the shape thus formed. The older quarries were generally more obtuse even than the later, and, in consequence, much more satisfactory in effect. The sizes vary considerably. The accompanying cut (Fig. 1) shows an ordinary size, but some of the earlier are nearer the square, and better than this.

This pane and another are the only instances I know in this district of unglazed ventilating panes. The strap-work is formed of a stouter lead, the spaces between being left open. This example comes from close to Godalming, but in order that it may not be "collected," I will not mention the exact spot. I think I remember seeing somewhere illustrations of similar panes from Sussex, where old work has been less destroyed than in this district.

The square, or more properly speaking, oblong panes are larger in size than the diamond, and run from 5½ in. by 4 in. up to 7½ in. by 6 in., the larger sizes being of late date.

The glass in the older windows has generally turned a charming dull green, entirely the result, I believe, of decay. One cannot, alas! reproduce artificially either any one or the variety of tints.

I may here be allowed a word against the common trick of providing lead lights filled with quarries of different colours of "cathedral

Fig. 4 is a usual form for the handle to the bottom bar.

Undoubtedly modern iron casements are much more useful in their constructive character, as they keep air and weather out, but I wish that some of the principal manufacturers would take the trouble to collect a few examples of old handles and reproduce them, instead of the clumsy and ugly types generally used.

Of ironwork generally there is a fair show in

the leading pattern-books. Such work can, however, be well reproduced by local workmen if they have the designs, or, better still, old examples, to copy from.

Of ornamental ironwork to gates, there is a very fine example of the last century in the flight to Trinity Church, Guildford, which, with the rising of steps belonging to it, is a splendid bit of design, of which any town might be proud. There is also a good gate at Stoke House, and other "bits" at Guildford and Godalming.

In this week's illustrations are shown the front and back of No. 25, High-street. This was a very fine house, erected by the Martyr family, who were hereditary town clerks of Guildford. The room on the first-floor in front has a fine plaster ceiling, and there is a good ceiling to the bow-windowed room at the back. This front room is always appropriated at Assize times to the High Sheriffs. There is also a very fine carved staircase, the carved panels being of similar style to the carving on the bow-window at the back. The classic timber front appears to be a casing to the original house, put up at a later date.

The sash windows shown in an annex at the back belong to this date rather than do the transomed and mullioned lights. The windows at the back are good examples of the bold and deliberate use of the square section frame. This garden front is covered between the windows with the mathematical tiles I have previously spoken of. The doorway and steps

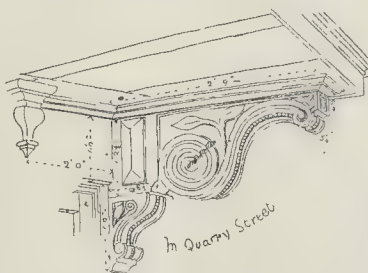


Fig. 5.

this neighbourhood which bordered on the old iron districts of Surrey and Sussex. Most of the local forges were, however, in the hands of the Crown for ordnance purposes, and, as far as I can make out, were finally dismantled when the country was occupied by the Parliamentary army under Sir William Waller. The hinges and ironwork to doors, &c., are good, but of a kind common to the kingdom. There is a

are of the later date, and rather spoil the effect of the elegant bow-window.

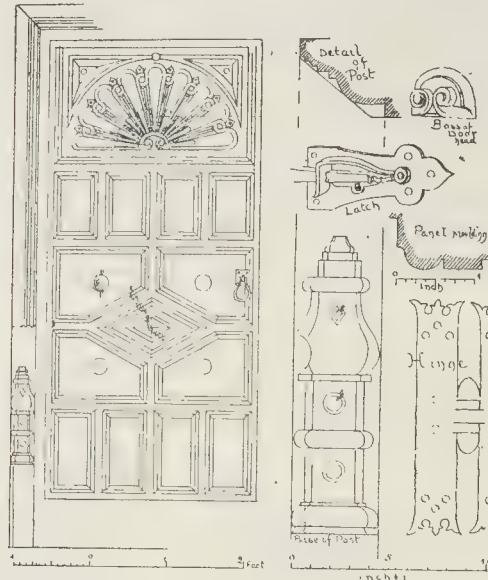
The house in Quarry-street is an old house that has been refurnished with ornamental rough-cast. The whole corner, when the Virginian creeper next door is in perfection, is a splendid bit of colour. Partly shown is a door-hood of good character (Fig. 5), topping to its

seemed to me an immense waste about the making of sketches unattached to any system. The student roams about picking out the plums, and neglecting the small details, the study of which is even more important. If a particular district is taken, or a particular subject studied and illustrated exhaustively, the work remains on record for ever, whereas hundreds

or four centuries of good work, before he begins to rove the country in search of novelties.

I have been unable to get into the series quite all the illustrations, plans, &c., that I have intended, but some of these will be found added in the book which I am publishing, containing the illustrations that have appeared in this journal, and letter-press re-written and enlarged by the addition of information of local interest.

RALPH NEVILL.



Door, Post & Details, 'White Hart' Inn, Guildford

Fig. 6.

fate, but one may hope that the present tenant will take better care of this house than has lately been done. There is a simple but quaint staircase inside. The house in Woodbridge-road is a rare example in this district of a form almost universal in some stone districts, in which gables are used all round, the ridges running out of the main ridge, and the gables being always kept slightly away from each other and from the end gables of the main roof.

The house on the Mount is to my mind a charming example of ornamental but simple brickwork of, I suppose, the eighteenth century. It is to be noted that the panels in this are sunk only 1 in. Of course the scale of the house is small, but it is a very common thing to see well-designed modern panel and "strip" work ruined by the projections being 4½ in., which is much too great for any delicacy of effect. The little panels in the top piece filled with flint would, I think, have been better omitted.

The house at the Castle arch is raised largely on the old stone walls. The front door of this cottage is a very good specimen.

I give drawings of a doorway in the back of the "White Hart" (Fig. 6) that is probably little known, being difficult of access. The door is not now connected with the posts, but I fancy from the relative positions they must have belonged to each other, and that the door has been cut down to its present size. There is a good door at the old Grammar-school, with a similar head.

The post (Fig. 7) given is part of the frame of the entrance to the stable-yard. The other post (Fig. 8) is one of two forming a doorway in a cottage in Bury-fields, and from the style of the work I should think may have been brought from the White Hart. There is a good door close by this made up of old pieces. On one side of the carriage entrance to the Angel Inn are the remains of work of similar date, part of the original main entrance to the inn. So much has been done to improve this ancient house that one would be glad to see a little justice done to this interesting bit of work.

I have now to wind up my series of studies of the work of this district. It is of set purpose that I have kept myself within narrow bounds, and resisted the temptation to make excursions into the neighbourhood. There has always

of desultory but admirable sketches are perpetually being published, and forgotten for lack of some point of attachment.

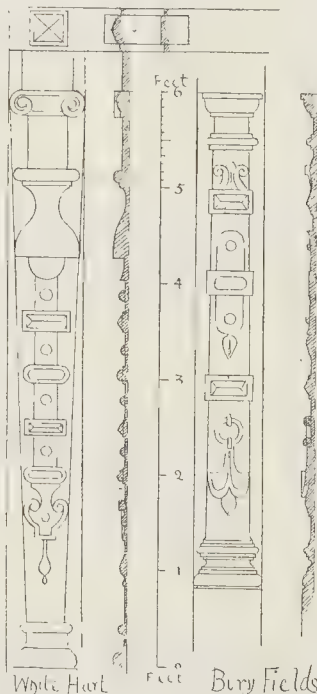


Fig. 7.

Fig. 8.

My own feeling is that a student will do best for himself by making a thorough and systematic study of his own neighbourhood, with its three

#### WITHAM NEW OUTFALL CHANNEL AND OTHER WORKS.

At the third ordinary meeting of the present session of the Institution of Civil Engineers, the President, Sir George B. Bruce, in the chair, a paper on "The Witham New Outfall Channel and Improvement Works" was read by Mr. J. Evelyn Williams, M.Inst.C.E., Boston. The author stated that in 1878 he was instructed by the Witham General Commissioners to report upon the improvement of the river Witham. He then found the outfall, or tidal portion of the river, most unfavourable, both for drainage and for navigation. A tide which rose 21 ft. in Clayhole, in the estuary of the Wash, only rose 12 ft. 6 in. at Boston. The lower reach of the channel, between Hobhole Sluice and the estuary, was not only shallow and circuitous, but untrained and broken through a mass of shifting sands. The flood-waters rushing seaward cut frequent and successive "steeps," from 10 ft. to 12 ft. in height, which kept tumbling into the channel and choking it up; the channel thus became distorted, and sometimes shifted a mile from east to west in a few weeks. The flood-tide, from the estuary, swept over these shifting sands, and flowed like a rapid wave up the river to Boston, carrying a large quantity of sand in suspension. This was deposited during slack-tide in the upper reach of the outfall, where in dry seasons, during the absence of the fresh water scour, the deposit reached the level of 11 ft. 6 in. above the sills of the Grand Sluice in Boston, and rendered the flow of neap tides insensible at the sluice. It was ultimately decided that the General Commissioners should promote a Bill in Parliament, and in the ensuing Session the River Witham Outfall Improvement Act, 1880, was obtained. Under this Act, the Witham Outfall Board was constituted, and, on December 14, 1880, the cutting of a new and shorter outfall channel, through the land, into Clayhole, in the estuary of the Wash, was commenced. The length of the new channel, from its commencement at Hobhole Sluice to its termination in the Wash, was three miles, and its sectional capacity was in excess of that of the Suez Canal or the Amsterdam Ship Canal. The depth of the excavation through the enclosed land was about 23 ft.; and the strata consisted chiefly of silt, and of brown and blue clay, with intersecting patches of peat, underlying which was a hard bed of boulder clay, in which the channel was formed for about two-thirds of its length. The material excavated was deposited in embankments on each side of the new channel, and a portion was utilised in forming the bank to close the old channel. Outside the old sea-bank the new embankments were extended simultaneously towards low-water mark on the outer foreshore, and then united in horse-shoe fashion, so as to exclude the tides from as large an area of the works as practicable. By this means the middle and heaviest section of the excavation was executed in the dry; whilst the outer ends of the channel were completed by dredging. The total quantity of excavation was about 2,000,000 cubic yards, and the most suitable portion was selected for forming the exposed slopes. To effect the closing of the old channel, it was necessary to form an embankment about half-a-mile in length, connecting the parishes of Fishtoft and Wyberton below Hobhole Sluice. The maximum height of this embankment was 35 ft., with a minimum top width of 15 ft., and side slopes of 5 to 1. The forming of this embankment was pushed forward simultaneously from the enclosed banks on each side of the old channel, and when the two opposite tip-heads had advanced within a distance of about ten chains of meeting, two parallel groynes of fascine-work and cliff-stone were run out on each side of the old channel. These groynes afterwards formed the outer toe of the new embankment, across the fairway of the old channel. On the final closing of the old channel, a most difficult operation, owing to the tidal scour, the advantage of the new and shorter outfall to the estuary became at once obvious, the general depression in the low-water level. The



## CHURCH-BUILDING NEWS.

incoming tides, instead of rushing up the river with a bore, as formerly, heavily charged with matter in suspension, now flowed in gently from the estuary comparatively clear, and vessels of 2,000 tons navigated the new channel with ease, compared with vessels of 300 tons, the largest the old channel could accommodate. In addition, the accumulation of deposit in dry seasons, during the absence of scour down the Witham, which formerly rendered neap-tides insensible at the Grand Sluice, in Boston, was now practically *nil*. The area of land draining through the new channel was about 762,215 acres, but only 194,649 acres contributed to the cost of the works. The outfall between the new channel and the Grand Sluice had been improved generally by training works and dredging, and the channel was now eight feet deeper than in 1878. These works were carried out by the Witham Outfall Board, and in continuation inland the Witham General Commissioners had, under their Act of 1881, enlarged the Grand Sluice and widened and improved generally the channel of the Witham for a reach of twelve miles above the sluice, as suggested in the author's report of 1878. The enlargement of the Grand Sluice comprised the construction of a wider and deeper lock on the site of the old one. The new lock was 30 ft. wide, or double the width of the old one, and the sills were 3 ft. lower. The excavations were carried down to the hard clay, upon which was laid a bed of concrete 7 ft. in thickness, consisting of 6 parts of ballast to 1 part of Portland cement. Upon this the floor was formed of finer concrete, and the sills of sandstone ashlar, 3 ft. in thickness. The heel-stones were of granite, and the side walls were formed of brickwork and concrete faced throughout with blue Staffordshire bricks. The doors, or gates, six in number, were built of English oak. The outer pair, 24 ft. 6 in. in height, were self-acting, and closed, so as to prevent the tides flowing up the Witham. During floods all the doors of the Grand Sluice were thrown open, and the four openings now formed a waterway 81 ft. in width, for the free passage of the flood-waters to the sea. The widening and improvement generally of the Witham, between the Grand Sluice and Tattershall Bridge, a reach of twelve miles, comprised the removal of the continuous projecting flat, or foreland of the banks, on each side of the channel. These projecting forelands, below flood-level, were a source of expense and obstruction, owing to the large quantity of flag that grew upon them, thereby virtually raising the bed of the river, and obstructing the seaward flow of the flood-water. The total quantity of the excavations in this section of the works was 602,059 cubic yards, and fascine work was used for the protection of the river-slopes at points where the strata were silty and yielding in character. The area draining through the Grand Sluice was about 500,000 acres, but only 34,726 acres, situated below Lincoln, contributed to the cost of enlarging the sluice and the improving of the river under the Act of 1881. The whole of the works were completed in May, 1887, and their aggregate cost was about 212,000*l*. The depression acquired in the low-water level at the several sea-slucies was:—

|                        | Ft. in. |                    | Ft. in. |
|------------------------|---------|--------------------|---------|
| Hobhole Sluice .....   | 6 6     | Black Sluice ..... | 4 0     |
| Mand Foster Sluice 4 3 |         | Grand Sluice ..... | 4 0     |

This large depression in the outfall practically meant the raising of the fenlands, and an immense benefit to the whole of the district and interests concerned.

#### A PLUMBER'S CLAIM FOR WORK DONE.

##### EMPTAGE V. TOLLNER.

THIS was an action brought by the plaintiff, Mr. Daniel Emptage, of Dane Hill, Margate, against the defendant, Miss Eliza Tollner, residing at Stafford House, St. Mildred's-road, Ramsgate, to recover the sum of 83*l*. 8*s*. 5*d*. for work done and materials supplied.

It appeared that the plaintiff, in his capacity as a specialist in sanitary matters, had been instructed to carry out certain drainage works at Stafford House.

The defendant had paid into Court the sum of 60*l*., but after a lengthy inquiry of nearly two days, the Official Referee (Mr. Ridley, sitting at Rolls Gardens, Chancery-lane) on the 19th inst. gave judgment for the plaintiff for the whole amount of 83*l*. 8*s*. 5*d*., and costs, remarking that, although in no previous case of this kind had he ever allowed the plaintiff the whole of the amount claimed, in this case he felt bound to do so, having regard to the evidence, which had conclusively shown that the works effected had been carried out in an exceptional manner, with the most modern sanitary appliances, and that the charges were reasonable.

**Coseley.**—Christ Church, Coseley, has lately been re-opened, after repairs and alterations. An extra row of pews has been placed along each side of the church, affording additional accommodation for more than 100 persons. The stone floor of the aisles has been taken up, and replaced by wooden blocks. Messrs. Jones & Willis, of Birmingham, have erected a new oak altar, which stands three steps higher than the previous one did. The pulpit has been lowered considerably, and the font removed further back. Considerable improvement has been effected in the lighting arrangements, two Wenham lights having been placed in the church, and one in the side-chapel. The heating apparatus has been renewed, and flues placed in the side aisles as well as in the centre. Arrangements have also been made for the heating of the side-chapel and vestries. A new clergy-vestry has been constructed over the choir-vestry. The space formerly occupied by the old vestry is converted into a side-chapel. The builders were Mr. H. Dorset & Son, of Cradley Heath, and the architect Mr. W. A. Bonney, of Rugeley. The total cost of the work has been nearly 900*l*.

**Cowley St. John.**—The foundation-stone of a new Mission Chapel at Cowley St. John, Oxford, has been laid. The chapel, which is to give sitting accommodation for 300 persons, is to be built almost entirely of brick, the full length being 69 ft. 6 in. by 28 ft. 4 in. It is proposed at present to build about half the full length of the structure, leaving the west end until sufficient money can be raised. There will be no accommodation for organ or choir, and the screen will lie low and open, serving both as a screen and as a communion-rail. The side walls are 14 ft. from the floor, and there will be a high-pitched roof with a small bell-turret rising from the centre. The north wall has been so built that the buttresses can be turned into piers, and the windows and brickwork cleared away, allowing an aisle to be added should the necessity arise. Mr. A. Mardon Mowbray is the architect. The present building will cost 1,000*l*.

**Dartmouth.**—The Town Church (St. Saviour's) was reopened on the 11th inst., after the restoration of the first section,—the chancel, chancel aisles, and vestry,—from plans by Mr. Ashworth, of Exeter. Beside this section a great portion of the roofs of the nave, aisles, and transepts, which are of polygonal form, boarded and painted in patterns, have been renewed, also wood ceilings with ribs and bosses to the chancel aisles. The buttresses have been repaired in local stone, with sets-off of granite. Owing to a difference of opinion as to the proper style, whether the proposed Decorated or Perpendicular should be adopted for windows and seats, Mr. Sedding was called in, and the chancel windows, seats, and floors were designed in Perpendicular by his advice. The glass of the north and south chancel windows (memorials) was designed and executed by Mr. F. Drake, of Exeter; also the glazing of the other windows. The works have been carried out generally by Mr. N. Rundle, of Kingsbridge. Messrs. Trask having supplied the chancel seats, also the windows in Douling stone. A heating apparatus has been arranged by Messrs. Garton & King, of Exeter, the stove-room being a crypt under the chancel. The vestry has been enlarged. The painting of the ceilings is by Mr. Way, of Dartmouth.

**Dulwich.**—The foundation-stone of All Saints' Church, West Dulwich, was recently laid by the Bishop of Rochester. The site of the new church is a fine piece of land given by the Governors of Dulwich College, near the Dulwich station of the London, Chatham, and Dover Railway. It is triangular in form, and has a fall from west to east of about 28 ft. The architect has tried to utilise this very considerable fall so as to add dignity to the east end and enhance the general effect of the church. The main scheme of the plan shows a wide and lofty nave of proportional length. There are seven double-arched bays, the shafts and main arches being carried up in red brick and stone, with stone caps, bases, and bands, the remaining portions of walling being of yellow brick, relieved here and there with red brick and stone bands. Spaces for colour decoration are placed immediately over the lower arches, and a clearstory is formed in spandrels above. The nave has a span of 40 ft., and is about 128 ft. in length, the total length of the church being over 200 ft. The three

easternmost arches open into wide north and south aisles, which are gable-roofed. An apsidal baptistery, with north and south narthexes as sides, are thrown out at the west end, immediately under a row of five single windows and a large rose window in the western gable. Two towers, placed angle-wise, and pierced with arches on all four sides, flank the great chancel arch north and south. By this uncommon form of plan a view of the altar is obtained by those occupying seats in the north and south aisles. The chancel, which is of the same height as the nave, is pentagonal in form at the east end. It is divided from the nave by a very lofty arch, the upper portion of which is filled with rich tracery, forming a sort of lacework of stone carried on two slender shafts of Devonshire marble, the bases forming portion of a low chancel-screen. A kind of roof-screen is formed of wrought-iron, and rising about 30 ft. from the nave floor; this screen, whilst acting as a constructional help, adds greatly to the general richness of effect, and it is considered that it will be one of the marked features of the new church. The eastern walls of the chancel will be enriched by seven lofty three-light windows, the heads being filled with tracery. An arch on the south side divides the chancel from the vestries and the organ-chamber, and another on the north side from the ambulatory and chapel and gallery for musicians or additional choir. An ambulatory running round the eastern wall forms a connexion between the chapel and the vestries, musicians, and organist. At the east end of the north aisle is formed a complete chancel and sanctuary, which, together with the north aisle,—accommodating, as it will, about 200 people,—forms almost a complete small church, with separate entrances for clergy and laity. This portion of the church will be heated and lighted independently of the main building. The nave floor being 28 ft. above the ground level at the east end, ample room is gained in the basement for a large crypt, which is designed to be used for various parochial purposes. The main features that the architect has tried to realise in the exterior have been:—(1) to attain loftiness and dignity throughout; (2) to take every advantage of the fall in site to get as grand an effect as possible at the east end; (3) to group the principal parts of the building as picturesquely as possible. With the means at his disposal the architect saw he could not hope to build a tower or spire of large dimensions, and therefore he has designed a kind of minaret tower, which, while it is in accordance with the feeling of the design generally, is sufficiently large to admit of a peal of bells. A *flèche* of very considerable height is placed on the centre of the roof at the junction of the nave and chancel. The church, when finished, will accommodate about 1,400 adults. The entire work has been designed by, and is being carried out under the superintendence of, Mr. Geo. H. Fellowes Prynne, A.R.I.B.A. London. The first contract only includes the foundations of a small portion of the east end put in for the purpose of laying the foundation-stone, the contractors being Messrs. Kynoch & Co.

**Epsom.**—The parish church, Epsom, has been re-opened, after repair and renovation. The works include the repainting of the gallery, re-colouring of the walls of the interior, repairing the roofing, and renewing the copings throughout, the copings and parapets being in an extremely bad condition. In addition to the work under the contract, the whole of the aisle benches, as well as the dado framing, had to be removed to fill up two cavities, caused by the decay of two tombs built in the wall (so says a local paper). Sugg's Christiana globes and burners have been fitted to the gallery, and new brackets with double lights have been substituted for the old single lights under the gallery, and additional lights have been fixed in the chancel. The font has been put in a more prominent position, and cleaned, and a new heating apparatus supplied by Mr. Dorset. The painting of the reredos is the work of Mr. F. A. Oldaker. The architects were Messrs. H. M. and E. W. Grelhier, and the work has been carried out by Mr. Chivington, builder, Epsom.

**Langridge.**—It is proposed to restore Langridge Church, Bath, at a cost of about 500*l*. From a long and interesting historical and architectural account of the church which appeared in the *Bath Chronicle* on the 15th inst., we gather that this very interesting building is now in a lamentable state of disrepair.



**Llanwddyn.**—The new church erected by the Corporation of Liverpool to replace the old parish church in the valley of Llanwddyn (removed for the construction of the Wyrnwy Reservoir) has been consecrated. The building is dedicated to St. Wddyn, and occupies a commanding position on high land to the right of the great embankment as seen from the Llanfyllin road. The church is designed with nave, transepts, choir, chancel, south aisle, and porch, and is constructed externally with local stone walls, with dressings of Cefn stones to windows, buttresses, and belfry. The style adopted is the Early Pointed, with the exception of the south door, which is semi-Norman, protected by a massive oak porch, with an inscription on the internal beams to the following effect:—"This church of St. Wddyn was erected A.D. 1887, the old Church of St. John being covered by Lake Wyrnwy." The interior has a triple arcade between nave and south aisle, and four deeply-moulded arches at the intersection of the nave, choir, and transepts. All these are of Bath stone, which contrasts well with the new Ruabon bricks, with which the whole interior walls are faced. A credence and sedilia are provided in the chancel, also of Bath stone. The roofs of the nave, aisles, and transepts are open to the ridges, with massive arched principals, collars, and ties, and moulded wall-plates. The choir and chancel have panelled ceilings, coved at the sides, and with bold wood ribs and plates. All the woodwork to roof is stained a dark oak colour, and varnished. There are dark oak screens to the transept arches, that on the north side enclosing the vestry. The pulpit, choir-stalls, and reading-desk are all of dark oak, and the front of the stalls is formed from old oak panelling, which was taken from the gallery front of the old church. The font and east gable cross from the old church are also used in the new buildings. The seating is of varnished pitch-pine; the floors of nave, aisle, and transepts are of solid wood blocks, and that of choir and chancel is of deep red and black tiles, arranged in simple patterns. The windows are glazed in tinted cathedral-glass, with coloured margins. The church is heated from a chamber below the vestry by means of a hot-air apparatus, supplied by Messrs. Cooper, Liverpool. Seats are provided for 184 persons, including a choir of nineteen, and more accommodation can be provided, if necessary, by extra seats or chairs. The architect entrusted with the carrying out of the works by the Water Committee was Mr. Francis U. Holmes, F.R.I.B.A., of Liverpool, and Mr. John Sadler, of Widnes, acted as clerk of the works. The contractors for the whole of the works were Messrs. Hughes and Owen, of Wrexham. The oak work and pews of the church were supplied by Messrs. Norbury and Patterson, of Liverpool; the tiled floors by Mr. Swift; and the plumbers' work of church and vicarage is by Messrs. Haskayne & Kirsopp, also of Liverpool.

**Loughborough.**—The chancel of Emmanuel Church, Loughborough, has just been decorated, at the cost of Mrs. Crosher. About half of the east wall was previously decorated, and this has been cleaned, while the remainder of the work has been carried out in harmony with it. The upper portion of the walls is in cerulean blue, and on the east wall, near the right-hand window, is the figure of St. John, holding a chalice, and near the left-hand window the figure of St. Gabriel, holding a lily. On the north and south walls are painted cherubim, and underneath are symbols of the four Evangelists, surmounting diaper-work composed of roses and gold crocuses. On the right side of the chapel are depicted angels praising God, and on the other side are saints. Texts have been inscribed on the window-sills, and the rest of the work has been carried out in accordance with the former designs. The work was executed by Messrs. Heighway, Kusel, & Depree, of London.

**Melbury Osmond.**—This little church has lately been re-opened, after having been closed three months for restoration, which has been carried out at the cost of Lord Ilchester, Mr. Blomfield being the architect. Though the structural parts of the building remain the same, the internal appearance is so greatly altered (according to the *Dorset County Chronicle*) that on first entering it the impression would be that the church has been entirely rebuilt. Before speaking of the present work it may be interesting to mention that the church was rebuilt by Mrs. Susanna Horner, an ancestress of the present Earl, in the last century. A monument in the church says:—"In the year 1745, this parish church, being ruinous, was

wholly taken down and rebuilt on the same foundation, and was adorned with pews, font, altar-piece, and Communion-plate, and the rectory enlarged by donations of land, and by its union with that of Melbury Sampford, in like manner enlarged, and before augmented with the bounty of the most gracious, most glorious Queen Anne," &c. The church is dedicated to Osmond, Saint and Bishop, and we find that at an early period some members of the family, "De Melburys," bore the name of Osmond. The earliest record of a presentation to the rectory is in the year 1327. The present building, of the Georgian period unmistakably, contains traces of a far more ancient and highly decorated structure, as shown by fragments of carving and tracery, which latter must have formed parts of large and handsome windows. In removing an unsightly gallery, an interesting discovery was made of a fine Gothic arch, at the entrance of the tower from the church, the key-stones and upper part having been cut away to give room for a square doorway, which gave admittance to the gallery. A flight of steps led up to this, in removing which a fine old Norman font was found, in a reversed position, and underneath it a head carved in stone (which has since been built into the wall of the new vestry). The altar-piece was removed some years since, when the widow of the late rector replaced it with a window in memory of her daughter. This window was put in by Clayton & Bell. At that time the church was partly restored, and since then two other memorial windows have been added. The present alterations include a new roof to the church, with an oak panelled ceiling; the closing of the south door, by which twenty sittings are gained; and the making of the west door into the principal entrance. The whole of the old high pews have been removed, and open benches substituted, these being of dark oak. Mr. Green, of Blandford, undertook the oak ceiling and all the woodwork, and Mr. Mumford supplied the Ham-hill stone.

**Ryme Intrinica.**—The parish church here has been re-opened, after alterations. In 1886 a new roof was placed upon the edifice, the walls were repaired, the tower restored, and the bells re-hung. Windows of "cathedral glass" were also put in. This work was carried out at the expense of the Duchy of Cornwall, the cost being 364*l*. The principal alterations now effected are the substitution of open benches for pews of the "horse-box" pattern, and the laying of a new floor. The front seats in the chancel contain ornamental panels from some of the old woodwork. The floor underneath the pews is formed of wood blocks. The aisles are paved with ornamental tiles. A new pulpit of pitch-pine has been fixed. The church was formerly of one level, but the chancel has now been raised 6 in., and the Communion-table another 6 in. An altar-rail of oak has been fitted. The gallery at the end has been removed. The builder who has carried out the alterations is Mr. J. Andrews, of Loughborough, Messrs. Benson, of Yeovil, being the architects. The cost will be 150*l*.

**Southborough.**—A new south transept has been erected at St. Thomas's Church, Southborough, Tunbridge Wells. The new work has been carried out by Messrs. C. J. Gallard & Son, from the plans of Mr. R. H. Garling, architect, at a cost of about 800*l*. The south aisle contains four two-light tracery windows, and an open-timbered roof resting on stone corbels replaces the lean-to plastered ceiling. The new transept gives accommodation for about twenty additional seats.

**Sparkhill.** The new Church of St. John the Evangelist, Sparkhill, was consecrated a week or two ago. The church is at present in the parish of Yardley. That portion of the church now erected provides seats for 663 persons, and when completed, by the extension of the nave, will contain seats for 1,000. The edifice is erected on the site of the temporary church. This site is triangular in form and limited in area, and the architects (Messrs. Martin and Chamberlain) have therefore been restricted in the preparation of the plan for some portions of the new building. The new church is cruciform in plan, with a nave at present 58 ft., and when completed 102 ft., long, by 45 ft. wide. The south transept is 45 ft. by 16 ft.; the north, 45 ft. by 14 ft., with an annex, 28 ft. by 7 ft. The chancel is 30 ft. by 44 ft., with an apsidal end, organ chamber on north side, and spacious vestry on south side capable of accommodating fifty people. Three entrances are provided to the church, and one to the vestry. A temporary brick wall divides the portion of the church already built from the site of the future extension.

The building is constructed of brick, with Derbyshire stone dressings on the outside, and is plastered throughout on the inside with adamant cement. It is built in the Early Gothic style. The roof is covered with brown tiles, supported on iron ribs, which are enclosed in pitch-pine; the ceiling is arched and supported, and divided into panels with moulded wooden ribs. Over each of the main ribs is a pitch-pine arcade, and the roof of the chancel is supported by pitch-pine arched trusses. The ribs of the nave and transept are supported on stone columns, and those of the chancel on stone corbels. The corbels and part of the capitals have been carved by Mr. Barfield, of Leicester. The window heads are filled with stone tracery. The chancel arch is formed of best moulded bricks of special design, supported on stone columns with carved capitals. The entire floor of the church is covered with deal blocks laid herring-bone fashion, on a concrete foundation, and the floor of the chancel with Craven, Dunnill, & Co.'s ornamental tiles. The seats are in pitch-pine. The gas-fittings and altar standards have been supplied by Messrs. Hart, Son, Peard, & Co., with the exception of two 20-light pendants. The church is warmed by Messrs. Haden's warm-air apparatus. The pulpit will be of oak, richly carved, on a Caen stone base. The reading-desk will also be of oak. In the designing of this church the architects have (according to the *Birmingham Gazette*) altogether discarded the old type of church, which divides the main body into nave and side aisles. By this means the columns and other obstructions to the sight are done away with, the preacher having the advantage of being able to see the occupant of every seat in the church, while the church is spacious and light, as well as striking in appearance. The present cost of the church will be about 4,550*l*, and the cost of the remainder, without the tower and spire, is estimated at 1,685*l*, making a total of 6,235*l*. The builders are Messrs. Sapcote & Son.

**Stoney Stanton.**—The parish church of Stoney Stanton has been re-opened, after restoration and enlargement. The work has been carried out under the direction of Mr. Wm. Bassett Smith, architect, London, by Messrs. Law & King, builders, Lutterworth.

**Warminster.**—According to the *Warminster Journal*, the rebuilding of the parish church is making good progress. The architect for the work is Mr. Arthur W. Blomfield, A.R.A. During the rebuilding of the chancel portion Mr. Blomfield was represented by his clerk of the works, Mr. J. Simpson, but that gentleman was afterwards removed to Woodford, Essex, to carry out a most important work for Mr. B. O'mfield, and Mr. W. Conradi has since then fulfilled the onerous duties of clerk of the works. The massive English oak roofs, covered in with lead and vigorously carved, will certainly be marked features. The nave has arcades of five bays on each side, and the vaulting shafts that carry the roof timbers above spring from sculptured angels, each of which will carry a musical instrument. The carved stone work on the exterior is very quaint. All the carved work in stone and wood about the new nave and aisles, like that of the chancel, is by Mr. Harry Hems, of Exeter. Mr. Gaisford is executing the woodwork, and Mr. W. Strong is the general contractor. The wrought metal work is by Messrs. Singer & Son, of Frome. One of the features in the newly-built church, when complete, will be the pulpit that Mr. George Vicary, of Warminster, has presented. This pulpit will stand upon the north side, close against the tower pier. It will be octagonal on plan, nearly 7 ft. high, and will have a base of blue Pennant stone, upon which will be a cluster of eight polished Devonshire marble columns. These Mr. Blomfield, in his design, shows supporting the main body of the pulpit, the lower part of which is to be of polished variegated marble. The angle columns and the upper cornice will also be of the same material, whilst the rest will be in finely-grained yellow magnesian limestone. There will be carved angels at each of the six angles. The pulpit is now being executed by Mr. Harry Hems, who is also making, from Mr. Blomfield's design, the new font, which is the gift of Mr. H. P. Jones, of Warminster. It is square on plan, the bowl being supported by five polished Purbeck marble columns. The font itself, together with the base and the slab the whole structure stands on, is of polished Hopton Wood stone. The various capitals and bases are carved, and on the four faces of the



bowl are circular panels. A view and plan of the church as restored were given in the *Builder* for Feb. 12, 1887.

#### SCHOOL BUILDING NEWS.

**Gloucester.**—The *Gloucestershire Chronicle* says that the Charity Commissioners have now finally approved of the amended plans submitted by Messrs. Medland & Son, architects to the Governors of the Gloucester United Endowed Schools, for building the new Crypt Grammar School in Friars Orchard, under the contract of Mr. Alfred King at the sum of £3,443. 10s. The buildings, which will have a front elevation to Brunswick-road, are to be of plain brick, with stone dressings to the windows and a stone turret for the bell. The rooms will consist of an assembly-room the full height of the wall plate, with three class-rooms adjoining; a junior boys' room on the ground-floor, a science and art room and laboratory above this, and a covered play-ground. The approaches to these rooms are from a corridor in the centre of the block.

**Shrewsbury.**—The Congregational Sunday-schools here have just been re-opened, after considerable enlargement. The new buildings, which are of red brick, with stone dressings and moulded Ruabon brick string-courses, consist of the extension of the width of the school-room, making the size of the room 50 ft. by 40 ft., the enlargement of the class-rooms over the school-room, and the erection of a new wing on the ground-floor, containing infants' school-room, library, china-closet, lavatory and other conveniences, entrance-hall, with stone staircase, and six new class-rooms. A house, with all necessary conveniences, has also been built for the accommodation of the caretaker. The schoolroom has been wainscotted and plastered and fitted with movable divisions for the use of separate classes; the old class-rooms have been re-arranged and enlarged with the building, so that, including the new rooms, there is now a total of twelve class-rooms. The whole of the building is heated with hot-water by Mr. Jackson, of Newcastle, and ventilated by Kershaw's pneumatic ventilators and fresh-air inlets. The work has been carried out from the designs and under the superintendence of Mr. A. B. Deakin, architect, by Mr. Thomas Morris, builder. The large schoolroom is lighted by five of the Wenham lamps.

**Southampton.**—The Southampton School Board have lately opened two additional departments to the Central District School, to accommodate some six hundred children, boys and girls, in the growing neighbourhood of Nichols' Town. The schools are situated in Argyle-road, near the junction with St. Mary's-road, and closely adjacent to the School Board offices recently opened, and with the addition of the existing infants' school form a set of buildings capable of accommodating nearly a thousand children. They were designed by Mr. E. T. Howell, the Board's architect, and built by Messrs. Honeychurch & Mitchelmore. They are faced with red brick, with white and blue brick bands and Bath stone dressings, and high-pitch slated roofs. The contract price for their erection was £1,150.

#### STAINED GLASS.

**Bristol.**—The window over the doorway in the north transept of St. John's Church, Redland, has been filled in with stained-glass as a memorial to the late vicar, the Rev. H. G. Walsh. There are four lights, with rather elaborate tracery. The subjects selected are our Lord blessing children and His charge to St. Peter. Each of these groups has been designed to occupy two panels, formed in canopy work, having below compartments in which are introduced shields, the central ones being the arms of the diocese and of the city, on the dexter side the arms of Walsh, and on the sinister those of Walsh impaling Weston. In the tracery are figures of St. Peter, St. John, St. Andrew, and St. James. The window is the design and work of Messrs. Joseph Bell & Sons, of Bristol.

**Lancaster.**—Two stained-glass windows and a brass tablet have lately been placed in Lancaster parish church, as a memorial to the late Mr. J. P. Chamberlain Starkie. The work was designed and executed by Messrs. Warrington & Co., of London.

### The Student's Column.

#### ARTIFICIAL STONES.—XXVI.

##### *Hardening of Lime and Cement Artificial Stone Mixtures.*

**I**N the preceding articles it will have been observed that all the more noteworthy of the artificial stones there enumerated contain lime or cement mixtures as the binding agents. It will be useful, therefore, to summarise a few of the sometimes conflicting theories that have been advanced to explain the hardening of such mixtures.

In the case of simple combinations of lime with sand, or allied siliceous materials, the cementitious character has been variously accounted for.

For many years it was believed that the harder the limestone from which the lime was obtained, the harder became the resulting mortar or concrete of which it formed part. Since Smeaton's time, however, this theory has found no acceptance. The formation of a superficial coating of silicate of lime on the grains of sand or flint has also been believed to be the chief agency in the production of a coherent mortar or stone. The addition of sand certainly prevents cracking, especially when fat limes are used, but whether the lime actually unites with the surfaces of the particles of the insoluble variety of silica such as sand represents, is, according to many authorities, a debatable point.

MM. Chatelier, Landrin, and others have shown that, to be really active, the silica must be present in the form of what they term "hydraulic silica," such as is obtained by the addition of an acid to alkaline silicates. The washed product is capable of uniting directly with lime, forming, according to Landrin, a silicate of lime, having the composition indicated by the formula  $4\text{CaO}, 3\text{SiO}_2$ . (Chatelier contends for the formula  $2\text{CaO}, \text{SiO}_2$ .) This silica imparts to lime hydraulic properties, and the mixture has been termed "Puzzo-Portland," from the belief that this easily-affected form of silica is found in puzziolana, the value of which, when added to good lime, was greatly appreciated before the more convenient manufactured hydraulic cements were introduced. The author is inclined to believe that there is some degree of chemical attraction established by the long-continued contact of lime with siliceous sand, but that the value and extent of this action has been over-estimated. The influence of the sand is evidently mainly mechanical in preventing the shrinking and cracking of the mass, the particles serving also as nuclei around which the lime collects and undergoes whatever chemical changes may influence it. Spiller contends that the hardening in mortar mixtures is due to the change of lime into carbonate, and Schott maintains that this is true even in the case of Portland cement, the hardening of which is generally ascribed to the formation of a hydrated silicate of lime and alumina. Schott relies for support in his contention mainly upon the observation that when the cement is moistened with solution of ammonium carbonate it hardens better than if pure water only is used.

On the other hand, many observers have loudly proclaimed the injurious influence of carbonic acid when added to lime before or during admixture with sand or other materials. To destroy the effect of the carbonic acid ordinarily dissolved in water, Dr. Higgins advocated the employment of lime-water in making up mortars and cements; and others have asserted that, especially in the case of hydraulic limes and cements, the efficiency of the hardening depends much on the slowness of their absorption of carbonic acid from the atmosphere. Lieutenant Innes, R.E., held that carbonic acid is injurious when absorbed by lime through air exposure, or retained through careless manufacture. On the other hand, the late General Scott, R.E., and others, have actually suggested the manufacture of limes and cements in which a portion of carbonate is still retained. One patentee has claimed the use of water charged with carbonic-acid gas in the making-up of mortars and cements.

Vicat's contention that "the absorption and penetration of this gas (carbonic acid gas) proceeds more rapidly in the hydraulic limes than in the fat limes," is disputed by his translator, Capt. Smith who supports Robertson's theory that the depth to which carbonic acid is absorbed into mortar in a given time, and, to a certain

extent, the induration from that cause, varies inversely with the hydraulic properties of the lime, which depend on the silica contained in it."

The "carbonate" hardening theory may be thus briefly explained. An intermediate or basic carbonate, which contains more lime than the ordinary carbonate, is first produced when slaked lime is exposed to the air, and this compound hardens when mixed with water. It has also been pointed out that, if this partial re-union of carbonic acid and lime is to be brought about, the latter must be previously combined with its equivalent of water. Dry quicklime will not absorb the gas, so that mortars and stuccos made with imperfectly-slaked lime remain caustic even after many years' exposure to the atmosphere.

The conflict of opinion, both as regards theory and practice, which is so bewildering to the student, has arisen largely from the fact that sufficient attention has not been paid to slight but very important variations in the chemical and physical constitution of the mortar or cement ingredients. To lay down a law that will hold good in every case requires a far greater amount of reliable and properly-tested evidence than is at present available. The dogmatic assertions of many experimenters are due to the limited scope of their observations, and not infrequently to the tempting but misleading system of first forming a theory and then making the experiments and observations fit in with it. The whole question of induration of cements, &c., depends so much upon the mode of preparation and conditions of treatment that to deal with it adequately would involve the preparation of a separate series of articles.

In concluding this lengthy, and yet condensed and incomplete résumé of a large and important subject, reference may be made to an invention for which letters patent were obtained by an Irish doctor in 1845, which is a curious illustration of the mania which possesses some folks for securing patents for the haziest of ideas, and which serve chiefly the unedifying purpose of perpetuating their ludicrous and elaborate ignorance of departments of knowledge in which they would pose as discoverers. The patent in question claims the use of magnetism for imparting harder and more stone-like qualities to mixtures of lime and water, or lime mixed with iron, antimony, alum, sulphur manganese, &c., "by arranging and disposing permanent magnets and causing friction of them within and against a vessel containing the lime to be operated upon, whereby the lime is made to absorb certain principles arising out of magnetic influence, assisted by friction, which causes the lime to become very hard and durable, and imparts to it an appearance similar to stone or marble." In another modification a current from a Smee's or Grove's battery is made to pass through the mixture. Further comment on this precious specification would be superfluous.

#### Books.

*Stair-Building in its Various Forms, and the new One-plane Method of Hand-railing.* By JAMES H. MONKTON. New York: John Wiley & Sons. London: Triibner.

**B**EFORE the appearance in 1792 of Peter Nicholson's "Carpenter's Guide," all the published treatises on stair-cases and hand-railing were based on erroneous principles, and were therefore inaccurate. The whole science of hand-railing is simply the accurate determination of the curves formed by the cutting of a cylinder by oblique planes, and Nicholson's principles were quite correct, his theory of cylindrical sections being the true one; but his method of applying it was complicated and difficult to follow. Newlands succeeded in somewhat simplifying Nicholson's methods of delineation, and in the work under notice the author attempts a still easier plan. The book consists almost entirely of plates which are well and clearly drawn, but the lettering is not always accurate. In the case of diagrams, when a large number of letters are used, it is always a difficult matter to ensure accuracy, but special pains should be taken, as nothing is more perplexing to a student who endeavours to understand the diagram and to follow the reasoning employed in solving a problem, than to find the letter E used in the letterpress when R is used in the diagram.



We can cordially recommend the plan of placing the letterpress opposite the diagram described, as we entirely sympathise with the author in his remarks on "the weary task of turning from reference pages to plates located at another portion of the book." A number of terms used in stair-building are defined, but in some cases a little confusion is caused, on account of the American phraseology not always being the same as our own. We are somewhat surprised not to find a definition of the *trace* of a plane, which, we remember, puzzled us considerably when we first met with the term in its technical meaning of the line common to two planes meeting at an angle. The work is certainly instructive, and the plans of various forms of staircase are useful to the student; but some of the designs for newels and balusters are of a fearful and wonderful character.

*Building Construction and Drawing.* By CHARLES F. MITCHELL, Lecturer on Building Construction at the Polytechnic Institute. Part I., First Stage or Elementary Course. London: B. T. Batsford. 1888.

THIS book has been compiled, the author says, primarily for the students at the Polytechnic Institute. It is, however, well worth the attention of any beginners in the study of building construction. It is a small and inexpensive book, containing a great deal of information, put in a clear manner and with as few words as possible, and illustrated by a great number of woodcuts, all very well and clearly drawn for their purpose; scarcely any point that is mentioned being without its illustration. The book treats of practical bricklaying, and the putting together of masonry, woodwork, ironwork, &c., with drawings of junctions of various kinds. Plumbing is also treated of, as far as coverings and gutters are concerned; the methods of joining pipes are touched upon. The author does not go into the larger subject of sanitary plumbing and appliances, in which much more than construction is involved. A chapter is given also to slating. Some samples of papers on construction set by the Science and Art Department are appended, as one object of the book is to prepare students for the elementary examinations of the Department.

It would have been better, in the chapter on roofing, to have given a simple and direct statement of the scientific principle of the truss, instead of leaving the reader to gather this from the reasons given separately for the introduction of various parts in a roof-framing as it advances in size. In regard to the fixing of slates, we should have been disposed to emphasise rather more the danger from the action of wind from nailing slates too high up; a danger which every high gale in a town illustrates. But in general the book appears an excellent and trustworthy little treatise as far as it goes, prepared and illustrated in a very thorough and practical spirit.

*Hazell's Annual for 1889: a Cyclopaedia Record of Men and Topics of the Day.* Edited by E. D. PRICE, F.G.S. London: Hazell, Watson, & Viney.

THIS appears to be the fourth year of issue of an exceedingly useful handbook of reference for writers as well as readers. It this year extends to 694 pages, as against 622 pages last year. The arrangement of the articles is alphabetical, and the typography is executed in such a way as to throw new or important points into relief. The matter contained between the covers of the work is remarkable both for quantity and variety: there is something of interest for "all sorts and conditions of men." It is claimed that the present issue exhibits considerable advances as compared with former issues,—a point upon which we cannot decide, as this is the first time we have seen the work. So far as we have been able to test it, the information contained in it relating to events in 1888 is fairly complete, but there are some omissions. For instance, whilst the "Obituary" for the year duly chronicles the decease of Matthew Holbeche Bloxam, George Godwin, Edward I'Anson, and Richard Popplewell Pullan, it does not contain the name of Charles Auguste Questel, the distinguished French architect, although other foreign artists and writers who have died during the year are included. A list of affixes which is given includes "F.R.I.B.A.," but not "A.R.I.B.A.," although "M.I.C.E." and "A.I.C.E." are both given. A more serious omission is the absence of all mention of the Royal Institute of British Architects and its

statutory Examinations. Neither do we find any mention of the Architectural Association or the Institute of Builders. We make these criticisms in no captious spirit, but in response to the express invitation given by the editor in the preface. Notwithstanding all that we have said, "Hazell's Annual" is a veritable mine of information, immediately accessible. We wish it continued success.

#### ALMANACKS AND DIARIES FOR 1889.

"THE BRITISH ALMANACK AND COMPANION" for 1889 (London: published by the Stationers' Company) is characterised by its usual completeness. Its contents include a list of Acts of Parliament passed this year, with abstracts of the more important ones, such as the Local Government Act. The article on "Architecture in 1887-88" is unsigned, and is somewhat optimistic in tone. Lord Grimthorpe and his work at St. Albans come in for a good deal of criticism, but what does the writer mean by saying that "technical critics have smothered, with ill-suppressed amusement, certain disclosures connected with Lord Grimthorpe's declared methods of construction, as evidenced in the work executed under his orders at St. Albans"? (The italics are ours.) We are not aware that any competent "technical critic" has sought to hush-up or extenuate any of the blunders made by the autocratic amateur who has been allowed to make havoc with so interesting a building as St. Albans Abbey. At any rate, we think we can take credit to ourselves for having "disclosed" or shed light upon some of Lord Grimthorpe's "declared methods." But, to leave this particular topic, we may point out that the article of which we are speaking omits mention of some important buildings, and is not free from blunders, some of them (as, e.g., "Sanchi Tape" instead of "Tope") being obviously due to the printer. The article on "The Art of the Year" is by Mr. Cosmo Monkhouse; that on "Music" is by Mr. J. A. Fuller Maitland; and those on Science are by Mr. E. W. Maunders. The absence of the name of the writer of the article on "Architecture" is therefore rendered the more conspicuous. But, when all is said, the "Almanack and Companion" is a very handy and useful volume.

"Whitaker's Almanack" for 1889 has just been issued. It is slightly larger than the edition for last year, and now extends to 704 pages. Amongst the articles given for the first time may be cited the New Local Government Act. Everything has been brought down to the latest possible date before publication, and verified and corrected by the latest available returns. It is unnecessary to say anything in commendation of this now indispensable reference-book.

Messrs. Hudson & Kearns, of 83, Southwark-street, have sent us a selection of their admirable professional and general Diaries for 1889. "The Architect's Diary," No. 12, will be found to meet all the requirements of an architect's office. "The Architect's Diary," No. 13, is the same diary, but with a larger amount of space devoted to each day. "The Builder's Diary," No. 11, is specially adapted to the wants of builders. A good Diary and Notebook for general use is No. 9. We have so often spoken of the great excellence of these Diaries that it is difficult to find new words in which to express our commendation. The same remark applies to Messrs. Hudson & Kearns's "date-indicating blotting-pads and book diaries" for 1889. Nos. 7 and 8A will be found especially handy for the desk; No. 8A has, besides the book diary and calendar tablet for engagements, a vellum tablet for "standing memos," and detachable strips of white writing-paper. Very handy for travelling is the blotting-pad portfolio diary, with book, tablet for memoranda, pocket, and pad.

"The City Diary and Almanack" for 1889 (London: City Press Office) is the twenty-sixth year of that useful publication.

"The Railway Diary and Officials' Directory" for 1889 (London: McCorquodale & Co.) is an exceedingly useful diary, interesting alike to railway travellers and railway shareholders. "The Railway Almanack" (same publishers) is a useful and well-printed sheet for office use.

From Messrs. William Collins, Sons, & Co., Bridewell-place, E.C., we have received "Collins's Improved Calendar Pad" for 1889, the feature of which is that under a small flap at the top of the pad a strip of paper for noting a week's engagements is provided for each week of the year, in such a way that the items for seven days are in view at once.

"Blackwood's Shilling Scribbling Diary," No. 1 (London: Griffith, Farran, & Co.), interleaved with

blotting-paper, is very good value for the money.

"Calvert's Mechanics' Almanack and Workshop Companion" for 1889 (London and Manchester: John Heywood) is the sixteenth issue of a very useful little publication, sold for fourpence. Although it seems to be primarily designed for the use of mechanical engineers, it contains a great deal of miscellaneous information useful for reference in offices and workshops generally. The architectural, engineering, and building notes are compiled by Mr. F. J. Bancroft.

#### VARIORUM.

"THE Electrical Engineer," Vol. I., New Series (London: Charles & Co., Salisbury-court, Fleet-street), is full of information of value, interesting not only to electrical engineering specialists, but to architects and the general public. It is well printed and illustrated, and appears to be carefully edited throughout. We wish it increasing success.—"The Garden Oracle and Floricultural Year-Book," for 1889, by Shirley Hibberd (London: *Gardeners' Magazine* office), is the thirty-first issue of that hardy annual. It is well and compactly arranged, and useful alike to the amateur and to the professional gardener.—We have received No. 1 of "The Library, a Magazine of Bibliography and Literature" (London: Elliot Stock), which starts with the new year. It is the organ of the Library Association of the United Kingdom, and, like all works issued by its publisher, is well printed. Its contents are varied and interesting, and it chronicles all matters of interest connected with public libraries.—Among the special features of the new volume of *Little Folks Magazine* (London: Cassell & Co.), commencing with the January number, are full-page "Fanciful Illustrations," by Walter Crane, with verses appropriate to the various months.—We learn that the fourteenth and concluding volume of Messrs. Cassell & Co.'s "Encyclopaedic Dictionary" is ready for publication. This work, which has been in preparation for nearly seventeen years, will, it is claimed, contain about 50,000 more words than any other existing dictionary. It extends to no fewer than 5,629 pages.—We are asked to mention that "Walks in Holland," an illustrated hand-book to some less frequented parts of Holland, including Friesland, Groningen, and Guelderland, edited by Mr. Percy Lindley, is in preparation (London: 123, Fleet-street). A chapter upon sculling and sailing in Dutch waters will be written by the editor.—The fourth edition of the "Illustrated Catalogue of Electric-Lighting Plant and Material," issued by the General Electric Company, 5, Great St. Thomas Apostle, London, is comprehensive, and contains some useful information on the subject.—Messrs. Measures Bros. & Co., of 57, Southwark-street, have sent us a very handy waistcoat-pocket calendar for 1889. It contains weights and sections of girders and joists, with their safe loads. The sizes of cast-iron columns, with calculated breaking loads, are also given in this useful little production.—"The Electricians' Directory and Handbook for 1889" is in preparation, and will be published early in January.

#### RECENT PATENTS.

##### ABSTRACTS OF SPECIFICATIONS.

890, Chimney and Ventilating Shafts. E. P. Brett.

This invention consists essentially of a pipe, which when used for ventilating purposes is fixed in any convenient position in the building or shaft, and when used for chimney draught is fixed on the chimney top. Attached to this pipe is an outer case or pipe kept in position by vertical webs or stays, leaving an annular space equal to the area of the main pipe. This outer case has openings to which pipes are attached internally, and pointing upwards, being by preference arranged in spiral form. A conical shaped cover, open at top, is attached by stays to the outer pipe or case, and a smaller size pipe, with a conical cover, is fixed over the opening. The action is promoted by the draught through the side pipes operating upon the upward current from the main pipe, and increasing the draught therefrom in proportion to the heat and rarefaction of the ascending air.

1997, Construction of Walls and Roofs. E. Dupont (Brussels).

By this invention, in order to effect the following improvements—(1) reduction in cost of manufacture; (2) easy mounting, without the employment of special workmen; (3) dismantling constructed walls and reconstructing them economically elsewhere; (4) and (5) resistance and rapidity, a system is designed the principal



features of which are as follows: Long laths or strips of iron or metal are entwined on a skeleton of similar material, and the walls composed of one or more panels, which are fastened to the entwined laths. These metallic panels can be employed without a lining, or can be lined with a protective metal, painting, plastering, or any other coating, constituting a facing which, wholly or partially, conceals them.

5,682, Sash Fastener. C. Jones.  
For security a difference is made in the form of the plate which receives the catch-bar or sash-fastener on the inner sash, and in combination. A recess is cut in the plate of sufficient length and width to receive an angle-piece and to allow it, where pivoted at its junction, to move backwards and forwards. When the window is to be fastened the catch-bar is pulled over until it comes in contact with the angle-piece, which may then be turned over, setting the bolt, which can only be moved from the inside.

6,908, Closing and Flushing Water-closets. E. Andreoni (Novara, Italy).

In the apparatus which is the subject of this patent the covering and uncovering of the pan is automatically effected, the lower part of the pan being uncovered only when the weight of a person rests upon the seat. The renewal of the water, which effects the sealing, is effected by means of a special pull, and the water, serving to clean the dish or pan, may be delivered automatically to such parts by the weight of the body. Mechanical means for effecting these movements are fully described in the specification.

14,568, Wall-tanks. R. C. Sayer.

According to this invention the walls themselves are made hollow, and contain the liquid required to be stored. Boundary walls to gardens or estates are made in this way, and the walls of buildings. Sometimes the inner surface of the wall is made water-tight, or, in other forms, a galvanised iron water-tank is constructed, which fits in the hollow walls. The tanks are fitted with partitions and valves to prevent the escape of the contents in case of a fracture.

14,998, Chimney-flues. A. Rost (Frankfort).  
In this invention double vertical flues are used, one of which serves to connect the fireplaces, ovens, or ranges with the flues, the other serving exclusively to conduct the soot and the products of combustion to a chamber at the bottom of the building, whence the soot may be easily removed.

NEW APPLICATIONS FOR PATENTS.  
Dec. 14.—18,273, T. Scarborough, Screws.—18,283, E. M. Pyreton, Metal Pipes or Tubes.—14,294, E. Strange & J. Austen, Smoke Extractors, Ventilators, &c.  
Dec. 15.—18,303, J. Abel, Automatic Door-closer.—18,322, N. Locke, Self-locking Bolts for Doors.—18,325, T. May, Hinge with Stop Motion.—18,330, G. Goffin, Connecting Lead Pipes, &c.—18,352, J. Williamson, Window Fastener.  
Dec. 17.—18,371, H. Illingworth & S. Rushworth, Screw Nails.

Dec. 18.—18,443, G. Tunks, Bakers' Ovens.—18,451, E. & J. Brook, Kinks.—18,482, G. & H. Schuck, Artificial Stone.—18,507, J. Davis, Mitre Joinery Appliances.

Dec. 19.—18,570, J. Papier, Curing Smoky Chimneys and Ventilating Rooms, &c.—18,599, N. Browne, Fireproof Doors.

Dec. 20.—18,608, R. Paul, Electric Bells.—18,624, J. Connell & J. Gordon, Valve Apparatus for Water-closets, &c.—18,637, G. Jones, Water-closets, &c.—18,643, D. Cameron, Flushing Apparatus for Water-closets, Drains, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.  
15,510, J. Turner, Door Fastenings.—15,745, J. Porter, Chimney Tops, &c.—15,850, J. Smith, Window Fasteners.—16,045, W. Thomson, Door Knobs, and Affixing same to Spindles.—16,182, J. Chandler, Sash Fastener.—16,185, A. Smith, Dressing White Lead, &c.—16,739, C. Sheehy, Fastening Coal-cellar Plates, &c., from the Outside.—16,811, W. Joy, Crushing and Grinding Cement, &c.—16,846, C. Allen and Others, Glazing.—17,149, D. McDonald, Workmen's Can Appliances.—17,257, W. Cussane, Colouring and Ornamenting Portland Cement.—17,446, G. Humphry, Weather Bars or Thresholds for Doorways and Doorsteps.—17,495, J. Dinmore, Incombustible Roof.—17,525, B. Philipson, Ventilation of Drain and Soil-pipes.—17,563, W. Lindsay, Fireproof floors.

COMPLETE SPECIFICATIONS ACCEPTED.  
*Open to Opposition for Two Months.*  
17,674, E. & R. Pym, Close-pan.—1,395, C. Houston, Covering for Walls, &c.—1,764, R. Stanley, Ovens or Kitchens for Bricks, Tiles, &c.—2,283, H. & J. Storey, Decorative Material for Walls, &c.—2,380, D. & R. Williamson, Warming or Ventilating Buildings, &c.—2,482, W. Bartholomew, Water-closets.—2,660, E. Johnson, Composition for Cleaning Wall-papers, &c.—2,803, J. Brunt and L. Griffiths, Artificial Stone.—2,855, G. Reunier, Draught, Dust, and Damp Excluder.—5,667, J. Auger, Fanlight and Ventilator Opener.—10,525, A. Boul, Water and Fireproof Floors, Ceilings, &c.—12,583, G. Bellingham, Alarm Fastenings for Doors and Windows.—14,422, J. Wright, Stoves and Tile-hearths for same.—16,800, W. Doehring, Plastering, &c.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

Dec. 10.  
By A. CHAPMAN (as Asst.).  
Berke, Winkfield—Enclosure of meadow land, containing 10 a. 3 r. 24 p., freehold ..... £880  
Twickenham, St. Margaret—The residence called "Templecombe," freehold ..... 850  
Park-road—A plot of freehold building land ..... 150  
By EASTMAN BROTHERS.  
Deptford—74, Dorking-road, 73 years, ground-rent 24. 10s. .... 215  
Penge—5 to 9, Railway View, 80 years, ground-rent 217. 10s. .... 325  
Hendon, Byron-road—Five plots of freehold land ..... 75  
Acton—4, Burlington-mews, 88 years, ground-rent £3 ..... 120

Dec. 11.  
By CHINNOCK, GALSWORTHY, & CHINNOCK (at Leeds).  
Leeds—"The Cardigan Estates"—  
Headingley—A plot of freehold land ..... 2,050  
"The Cardigan Arms" Inn, and 6 a. 2 r. 30 p., freehold ..... 6,250  
Numerous dwelling houses and cottages, freehold ..... 8,680  
The residence called "The Woodlands," freehold ..... 1,800  
The Grove Spinning Mills, and 17 a. 1 r. 17 p., freehold ..... 4,500  
The Bridge Oil Mills, and 4 a. 0 r. 21 p., freehold ..... 1,750  
Enclosures of freehold land containing about 88 acres ..... 22,415

Dec. 12.  
Kirkstall—"The Hawesworth Wood Estate," containing 116 a. 3 r. 3 p., freehold ..... 4,400  
Numerous cottages and enclosures, containing about 97 acres, freehold ..... 12,360  
The "Kirkstall Abbey," and 12 a. 1 r. 4 p., freehold ..... 10,000  
The "Abbey House," and 2 a. 1 r. 31 p., freehold ..... 3,500

Dec. 13.  
Farley—Ings Hall Farm, containing 62 a. 3 r. 6 p., freehold ..... 3,750  
Wentworth Farm, containing 66 a. 1 r. 14 p., freehold ..... 2,975  
Wood End Farm, containing 85 a. 2 r. 6 p., freehold ..... 2,350  
Park Spring Farm, containing 37 a. 3 r. 12 p., freehold ..... 2,300  
Enclosures containing 30 a. 0 r. 2 p., freehold ..... 15,645

Dec. 14.  
Bramley—Stone sawing-mill and wharf, freehold ..... 1,000  
"The Cardigan Arms" public-house, freehold ..... 2,250  
Hough Top Farm, containing 24 a. 3 r. 17 p., freehold ..... 1,550  
Numerous houses, farm-buildings, and 215 acres ..... 23,360  
Headingley—Freehold ground-rent of £21 per annum, reversion in 73 years ..... 740  
Freehold chert rents of £258. 0s. 4d. per annum ..... 8,555

Dec. 17.  
By WALTER HALL.  
Soho—181, Wardour-street, freehold ..... 3,000  
Haverstock Hill—Ground-rents of £24 per annum, reversion in 97 years ..... 675  
Willden—Ground-rents of £31 per annum, reversion in 97 years ..... 650  
Fulham—36 and 37, Walden-avenue, 97 years, ground-rent £14 ..... 635  
15, Holcarf-pavement, 97 years, ground-rent £5 ..... 650

Dec. 18.  
By G. G. FLINT.  
Walham Green—64, Farm-lane, freehold ..... 250

By H. RUTLEY.  
Wandsworth—30 and 32, High-street, and stabling, 39 years ..... 750

By C. P. WHITRELY.  
Chiswick—63, 63A, and 63B, Bolton-gardens, 80 years, ground-rent £5 ..... 370

By MICHAEL, BOOKER, & CO.  
Hyde-park—42, Duke-street, freehold 45 years, ground-rent £40 ..... 2,410

19 and 21, Sussex-gardens, 48 years, ground-rent £29 ..... 4,500

Bathurst-mews—Improved rental of £110 per annum, 48 years ..... 1,800

St. John's Wood—Improved ground-rents of £58. 6s. per annum, 49 years ..... 1,630

Improved ground-rents of £32. 9s. per annum, 49 years ..... 630

Improved ground-rents of £53 per annum, 49 years ..... 1,010

60 and 62, Loudoun-road, 49 years, ground-rent nil ..... 1,005

Twickenham—Ground-rents of £21 per annum, reversion in 97 years ..... 380

Dec. 19.  
By R. TIDY & SON.  
Islington—50, Hallford-street, 67 years, ground-rent 27 ..... 560

Mile End—1 to 5, Cornwall-place, 96 years, ground-rent £20 ..... 170

By JAMES LANG & CO.  
Clarendon—1, Little Bath-street, freehold ..... 540

Bishopsgate—23, Duke-street, freehold 45 years ..... 260

By J. DAVISON & SON.  
Surbiton, Adelaide-road—"Naburn" and "Clovelly," 61 years, ground-rent £14 ..... 1,150

12 and 13, Ewell-road, 61 years, ground-rent £2. 10s. .... 1,150

Butcher's shop and premises, 61 years, ground-rent £2. 10s. .... 1,210

5, Ewell-road, Duke-street, freehold 45 years ..... 900

Kentish Town Ground-rents of £40 per annum, term 73 years ..... 750

By J. A. SMITH.  
Chiswick, Hogarth-lane—Copyhold residence, and 14 acres ..... 1,400

4, Chiswick-square, copyhold ..... 425

Hammermith—1, 2, 3, and 4, Rose Cottages, freehold ..... 720

Dec. 20.

By F. C. MOORE.  
Brixton—158, Loughborough-road, 34 years, ground-rent nil ..... £395

By NEWSON & HARDING.  
Battersea—132 and 134, Ingrave-street, 87 years, ground-rent £9 ..... 385

Barnbury—48, John-street, 20 years, ground-rent £5 ..... 150

Horton—89, Murray-street, 54 years, ground-rent £4. 4s. .... 350

Commercial-road East—25, 27, and 29, Jane-street; and 3, Anthony-court, 11 years, ground-rent £7. 2s. .... 265

Bermondsey—1, 3 to 12, 14 and 15, West-grove, 25 years, ground-rent £15. 10s. .... 725

Islington—1 to 7, St. Alban's-place, 38 years, ground-rent £16. 12s. .... 330

Hackney—38 to 48 even, Lower Duncan-street, 50 years, ground-rent £20 ..... 580

Holloway—108 and 110, Cottenham-road, 68 years, ground-rent £10 ..... 260

57, Langdon-road, 88 years, ground-rent £5 ..... 110

Islington—25 and 27, Church-lane, freehold ..... 430

42, Britannia-row, copyhold ..... 235

By DOWSETT & CO.  
Woolwich Common—Freehold ground-rents of £109. 5s. per annum ..... 2,160

Stamford Hill—Freehold ground-rents of £22. 4s. per annum, reversion in 79 years ..... 1,510

By BRAD & WILTSHIRE.  
Mackintosh-square—No. 4, 19 years, ground-rent 218 ..... 720

Gray's Inn-road—No. 278, 15 years, ground-rent £7 ..... 335

Borough—117, 118, 119, and 120, Great Dover-street, 3 years, ground-rent £23 ..... 85

Newington Causeway—48, Devonshire-street, 21 years, ground-rent £4. 16s. 8d. .... 95

Brixton-hill—No. 192, 16 years, ground-rent £10 ..... 750

Lea—67 and 69, Burnt Ash-lane, 75 years, ground-rent £30 ..... 580

1 to 10 and 12, Dorville-road, 75 years, ground-rent £35 ..... 2,000

By FULFLEX & FULFLEX.  
South Kensington—20, Finborough-road, 74 years, ground-rent, £10 ..... 560

Silvertown—7, Market-place, 88 years, ground-rent £8 ..... 370

By W. B. NORRIS.  
Battersea—55, Kilton-street, 77 years, ground-rent £8. 6s. .... 115

Hegent's-park—10, Moreington-crescent, 30 years, ground-rent £10. 10s. .... 680

MEETINGS.

WEDNESDAY, JANUARY 2.

Builder's Foremen and Clerks of Works' Institution. Ordinary meeting.—8.30 p.m.

FRIDAY, JANUARY 4.

Architectural Association.—Mr. Francis Masey on "London Street Architecture, as it is, and as it might be," 7.30 p.m.

SATURDAY, JANUARY 5.

Association of Public Sanitary Inspectors.—Mr. E. Tidman on "The Drainage By-Laws as Administered under the Metropolis Local Management Acts."

Miscellaneous.

A New Theatre is about to be erected on the site of the Old Gaiety Theatre, Douglas, Isle of Man, for Mr. Jas H. Elphinstone, from the designs of Mr. John Taylor, architect, of Longton, Staffs.

New Reredos, Buxton Parish Church, Hants.—A new reredos in oak, in memory of the late rector, has just been fixed. The work has been executed by Messrs. Jones & Willis, from the drawings of Mr. W. F. Cave, architect, London.

The Shropshire Archaeological and Natural History Society has decided that a special fund shall be raised to defray the cost of transcribing, for publication in the Transactions of the Society, Blackway's MS. Parochial History of Shrewsbury Hundred, and other MSS. relating to Shropshire in the Bodleian Library and elsewhere, and so greatly increase the value and interest of the Society's publications. Subscriptions to the fund are invited.

The West Front of Bath Abbey.—"County Magistrate" writes as follows to the *Bath Chronicle*:—"The scaffolding erected at the west window of the Abbey Church (presumably in connexion with the insertion of painted glass) calls one's attention to the unfinished state of the noble west front. Many years have elapsed since the restoration of the Church, and the partial restoration of this portion of the building. When the scaffolding was removed many years ago, few persons would have supposed that so long a period would elapse before the restoration of the west front was completed. No feature of the Abbey Church is more impressive than its historical and finely-proportioned west front, and it must be a subject of astonishment to visitors and of dissatisfaction to residents who admire the Abbey Church that this serious blot in the completeness of its restoration should so long remain."



**Simson & Mason, Limited.**—The directors, in their second annual report, to be submitted to the shareholders at the Cannon-street Hotel, E.C., on Monday next, December 31, state the result of the Company's business for the year ending October 31, 1888. The improvement in trade to which the directors looked hopefully when meeting the shareholders at the end of 1887 has, to a large extent, they say, been experienced during the past year, with the satisfactory result that the profit made by the company shows a substantial augmentation as compared with the 1887 balance-sheet, the net profit for the present year being 15,086l. 16s. 9d., as against 11,807l. 7s. 9d. in 1887. Adding the amount carried forward from the earnings of 1887, viz., 1,007l. 7s. 9d., the total sum now disposable is 16,094l. 4s. 6d. By the articles of association of the company, this amount is applicable as follows, viz.:—The shareholders are first entitled to a dividend of 10 per cent. (including the interim dividend of 4 per cent. paid on April 30 last), which absorbs 12,000l. Next, out of the surplus profits of the year 1888 the Directors are entitled to remuneration at a rate not exceeding 3 per cent. upon the paid-up capital of the company, but propose for the present year (which practically includes 1887 also, as no remuneration was paid in that year) to accept 2 per cent. only, amounting to 2,400l., leaving (after further writing off the special outlay at Barcelona and Paris, viz., 635l. 10s. 6d.) a final surplus of 1,058l. 14s., which it is proposed (subject to the approval of the shareholders) to carry forward. The Directors recommend this application of the profits accordingly.

**New Theatre at Halifax.**—A new theatre for Halifax is now in course of erection at the south corner of North Bridge. The theatre is being built by Mr. George Charnock, of Halifax, from the designs and under the superintendence of Mr. Frank Matcham, architect, London. The auditorium is planned to hold about 2,000 persons, and is divided into four parts, the ground-floor containing about twenty rows of pit seats and three rows of orchestra stalls. The first tier (level with North Bridge), is divided into dress-circle, private boxes, and cloak-room, the second tier being the upper circle, with the gallery over. The principal entrance is from North Bridge by two pairs of wide swing doors into a large vestibule, paved with mosaic, and with the walls and ceiling richly decorated. The pit entrance is from the corner of North Bridge, and the gallery entrance is from North Bridge-street by a stone staircase in easy flights, with landings carried up to the promenade at the top of the gallery. The total cost of the theatre, including the site, is estimated at 16,000l.

**Indexes to "The Builder" in the Library of the R.I.B.A.**—The last-issued number of the "Journal of Proceedings" of the Royal Institute of British Architects contains the following paragraph:—"For the purpose of saving time and labour to readers in searching the back volumes of *The Builder* in the Library, the indexes of volumes i.—ii. (1843-1886) have been collected and bound together in a separate volume. The collection of the indexes has been a work of some time and trouble, many of the early ones being out of print and hard to obtain. Even as it is, the index of vol. iii. (1845) is wanting, and the present note is inserted in the hope that it may meet the eye of some member able and willing to present or sell it to the Institute, and thus render the collection complete."

**"Cheap Food and Shelter Depots" in London.**—The erection or adaptation of existing premises for "Cheap Food and Shelter Depots," in different parts of London, for the Salvation Army, is being rapidly pushed forward. A contract amounting to £750 for one at Burne-street, Edgware-road, has just been secured by Mr. A. Martin, builder, of Battersea. Plans are in preparation for two in Whitechapel and one in Clerkenwell. Mr. J. Williams Dunford is the architect.

**Mission Hall, Burpham.**—A new mission hall at Burpham, Surrey, has lately been opened. The building is externally of red brick, with ornamented panels and arches. The roof is open to the collar, the timbers of which are shown, and rest on corbels. The work has been carried out by Mr. W. J. Butt, of Woking, from plans by Messrs. Peak, Lunn, & Peak, architects, Guildford. The cost of the building, with accessories, has been over 500l.

**Barry Free Church, N.E.**—A new Free Church at Barry was opened the other day. Mr. James M'Laren was the architect.

**Factory Inspection.**—The evidence which Mr. Lakeman gave last week before the Lords' Committee upon sweating is even more interesting for the side light which it casts upon the conditions under which factory inspection has to be conducted in London, than for the facts as to the condition of the toilers themselves. Sanitation can no more be enforced than the observance of public order without an efficient police; and the report which Mr. Lakeman was able to give of his own work was, while highly creditable to himself, suggestive of a great deficiency in the personnel of the department over which he presides. With the help of one assistant he has to satisfy himself as to the sanitation, ventilation, hours of labour, and time of meals in 4,000 factories, distributed over about one-third of the whole area of London. It needs no proof to show that, even if his assistant be as devoted as himself to the duties that he is called upon to discharge,—and more than this it is hardly possible to say,—it is inconceivable that two pairs of hands can undertake such an enormous mass of work. Even the small assistance which might be afforded by sanitary authorities in the way of directing the inspector's attention to quarters where it might be usefully bestowed does not appear to be ordinarily forthcoming. "It is a curious thing," said he, in answer to a question put by Lord Dunraven, "that since your lordships have had your sittings here I have had six notifications from sanitary authorities of workshops which should come under our supervision; but previously we had none." The work of the inspector under such conditions is a thankless and almost a hopeless task. If it has not proved utterly abortive, the credit is due to an excellent public servant, and in no measure to the system which he has had to administer or the support which he has received from the central authorities. We are not disposed to undervalue the advantage of having our factory inspection or any other public work done by whole-souled officials, but we do say that there is here a proved case of defective machinery which stands in need of prompt and thorough repair.—*The Lancet*.

**Interesting Discovery near Corfe Castle.**—A Dorsetshire paper reports that during some ploughing operations, at about 6 in. below the surface, the discovery of a Roman pavement, composed of red tile and white stone, was made at Furzebrook, about a mile from Corfe Castle. On further excavations being made by Mr. Laurance Pike, the foundation of a large building and fragments of Kimmeridge pottery, bones, horns, &c., have been found. The flooring is about 10 ft. square, and is composed of small square blocks of very hard stone, measuring from 1 in. to 1½ in. each way. Some are red, and some are white, and a regular pattern is laid down. The ground-work is of the white, and the actual pattern is surrounded by a deep bordering of red. Within this bordering there are a number of small square patterns. These are of white stones, with four red pieces in the centre. About twenty years ago a discovery of similar nature was made in the same field. The foundation of a room has also been found about one hundred yards from the spot. This room would appear to have been twelve feet square. Several successful photographs of the floor have been secured by Mr. Usher, of Furzebrook.

**Mission House, Ditchingham.**—A few days ago a new Mission House, consisting of a room 50 ft. by 18 ft., a residence for the two sisters in charge, and a small oratory, was opened at Ditchingham. The large room is made divisible by a movable partition, and has a pitch-pine roof with trusses, cut queen-posts, and wane boards. It is brick-built, part half-timbered and rough-cast, the total cost being 1,050l. We are told that this makes the eighth building erected by and under the control of the All Hallows' Community, who settled in this parish in 1859, when they built the House of Mercy. Since then they have erected two orphanages, a country hospital, a priests' house, and, more recently, a Community House, Holy Cross House, a memorial wing to the late Rev. W. E. Scudamore, from the designs and under the superintendence of Augustus Frere, F.R.I.B.A., London. The whole of the works have been carried out by Mr. Robert Morris, Ditchingham, Norfolk.

**Street Improvement and St. Michael's, Coventry.**—The *Coventry Herald* of the 7th inst. published a plan for an important street improvement at Coventry, which would open out to view from Cross Cheaping the grand church of St. Michael's, the restoration of the tower of which, at a cost of about 20,000l., is now approaching completion.

**The Lyric Theatre.**—Messrs. Bellman & Ivey ask us to say that the fluted columns (mentioned in the description given by us last week) are of "scagliola," made by them under Mr. Phipps's direction. We may also add that Hayward's patent pavement lights were supplied and used at the theatre. The following description of the electric fittings has been supplied to us by Messrs. Benham & Froud:—"The principal electrolier, illuminating the whole of the auditorium, was carried out from a suggestion of Mr. Leslie's, and represents an inverted bouquet of corn, barley, and poppies, in "prodigal confusion." The upper portion is a curved cone of *repoussé* work, representing the stalks bound together with wisps of straw, and ornamented with scroll work. Below this is a band around which twenty lights are placed, then, thirteen stalks descend, upon each of which are ten incandescent lamps burning inside embossed poppies, and ornamented with a corresponding number of wheat ears. The work is executed in copper and brass, electro-gilded, frosted, and partly burnished, the poppies being of frosted silver inside, for effect, and for enhancing the light. This electrolier is about 8 ft. high by 6 ft. diameter; the effect, with its 180 lights, is brilliantly fine. The Grand Saloon is at present lighted by two girandoles, forming part of the over-mantel. These have large *repoussé* backs (36 in. by 14 in.), embossed in Renaissance style, figures of boys with musical instruments being introduced. From about the centre of the plaques spring three massive chased dragons, and from their mouths three branches, each holding a lamp in silvered cup, making eighteen lights in all. These girandoles are also electro-gilded, with the conspicuous parts burnished. The Royal room is lighted by four brackets, each with five lights, delicately treated in the Adam style, and executed in frosted and burnished silvered work. The grand entrance has six descending four-light brackets, and the crush room two of the same design, and two semi-coronae, each with six lights, made in combinations of polished and frosted brass, and designed in harmony with the Pompeian decoration of these two apartments. The fittings for saloon, Royal rooms, and Pompeian rooms, have been specially designed by Mr. Owen W. Davis, and the whole work has been carried out under the direct supervision of Mr. M. Laws, Director of the Art Department at Messrs. Benham & Froud, who designed the wrought-iron and brass railing dividing stalls and orchestra, also made as these works. Messrs. J. & C. Christie, of Mansell-street, write to say that they executed the plumbing and sanitary work, fire-mains, and gallery stair-rails.

**Crystal Palace.**—The pantomime produced here on Christmas-Eve, written by Mr. Horace Leonard, and produced under the direction of Mr. Oscar Barrett, is entitled "Cinderella." It went very well, and is likely to be popular. An attempt has been made to tell the story of Cinderella concisely and dramatically, without the introduction of irrelevant incidents, topical songs, or political allusions, which, as the manager says, "tend to confuse children, and impede the action of the piece." But the management are not so scrupulous in all things; the harlequinade being made the medium of advertisements,—well paid for, it is to be presumed.

**Manchester Students, Institution of Civil Engineers.**—The second annual dinner of the Association of Manchester Students of the Institution of Civil Engineers was held on Wednesday evening, the 12th inst., at the Grand Hotel, Manchester. Mr. J. Proctor, M.Inst.C.E., V.P., occupying the chair, in the unavoidable absence of the president, Mr. A. Jacob, B.A., M.Inst.C.E. After the usual loyal toasts had been honoured, Mr. J. H. Lynda, M.Inst.C.E., P.P., proposed "The Institution of Civil Engineers," and several of the students contributed songs, &c., a very pleasant and social evening being spent. The number of members and visitors present was 51.

**Value of Land in the Isle of Man.**—On the 19th inst. a portion of the well-known Castle Mona Estate, facing Douglas Bay, was offered at auction by Mr. Alfred Baker, of Queen Victoria-street, London, in the presence of nearly 1,000 persons. Extraordinarily high prices were realised, thirty-eight plots realising no less a sum than 21,600l., being at the rate of 12,100l. per acre. One corner plot, with a frontage of 35 ft., by 97 ft. deep, realised 1,250l., being at the rate of nearly 13,000l. per acre.



The R. C. Church of St. Joseph, Southampton, has been reopened, after undergoing repairs almost amounting to a reconstruction of the edifice. The south wall of the nave has been taken down and rebuilt, with seven two-light windows, the heads of which are filled with Decorated tracery. The old windows of the north wall have also been taken out and new windows inserted, the details of the tracery being of different design from that adopted with the south wall. A new open-timbered roof has been constructed, with eight framed and moulded hammer-beam principals, rich in detail, with moulded and shaped wall posts rising on bold stone corbels. The space between the heads of the windows and the roof is filled in with a decorative and enriched cornice. An arcade of three arches, with a triforium window, separates the blank wall-spaces over the two side aisles, being filled with tracery. The church is floored with wood blocks of interlaced pattern, with mahogany borders, whilst the floor of the sanctuary has been raised and laid with encaustic tiles, and is approached by two Portland stone steps. The walls and ceiling of the sanctuary have been repainted, and left for future decoration. The old organ gallery has been taken down and re-constructed, the arch reformed, and the lower portion is filled with a framed and moulded screen, the upper panels of which are glazed with lead lights. A new sacristy of larger dimensions is built, the old windows taken from the north wall of the nave being readapted for use here. The whole of the masonry has been executed in Corslen Down Bath stone. Two hot-air stoves have been brought into requisition for warming the church, and the gas-fittings have been furnished by Messrs. Lankester & Son. The architect of the work is Mr. Leonard Stokes, of London, and the contractor was Mr. W. H. Chapman, builder, Woolston.

|                                                         |        |       |      |       |
|---------------------------------------------------------|--------|-------|------|-------|
| Deals, Swedish .....                                    | 7 10   | 0     | 16 0 | 0     |
| White Pine .....                                        | 8 10   | 0     | 17 0 | 0     |
| Canada, Pine, 1st .....                                 | 16 0   | 0     | 23 0 | 0     |
| " 2nd .....                                             | 11 0   | 0     | 17 0 | 0     |
| " 3rd &c .....                                          | 7 10   | 0     | 10 0 | 0     |
| " Spruce, 1st .....                                     | 7 10   | 0     | 10 0 | 0     |
| " 3rd and 2nd .....                                     | 9 0    | 0     | 8 10 | 0     |
| New Brunswick, 1st .....                                | 8 15   | 0     | 23 0 | 0     |
| Battens, all kinds .....                                | 5 10   | 0     | 12 0 | 0     |
| Flooring Boards, sq., 1 in., pre-<br>pared, First ..... | 0 11 0 | 0     | 14 8 | 0     |
| " Second .....                                          | 0 8 0  | 0     | 10 8 | 0     |
| " Other .....                                           | 0 7 0  | 0     | 10 0 | 0     |
| Cedar, Cuba .....                                       | 0 32   | 0     | 0    | 4 1/2 |
| Honduras, " .....                                       | 0 32   | 0     | 0    | 4 1/2 |
| Australian .....                                        | 0 0    | 3     | 0    | 3 1/2 |
| Malagasy, Cuba .....                                    | 0 0    | 3     | 0    | 3 1/2 |
| St. Domingo, cargo average .....                        | 0 0    | 3     | 0    | 3 1/2 |
| Mexican .....                                           | 0 0    | 4 1/2 | 0    | 0     |
| Mohogany, Tobacco, cargo average .....                  | 0 0    | 4 1/2 | 0    | 0     |
| Honduras .....                                          | 0 0    | 4 1/2 | 0    | 0     |
| Bor .....                                               | 0 0    | 4 1/2 | 0    | 0     |
| Walnut, Italian .....                                   | 0 0    | 12    | 0    | 0     |
| " Foot .....                                            | 0 0    | 12    | 0    | 0     |



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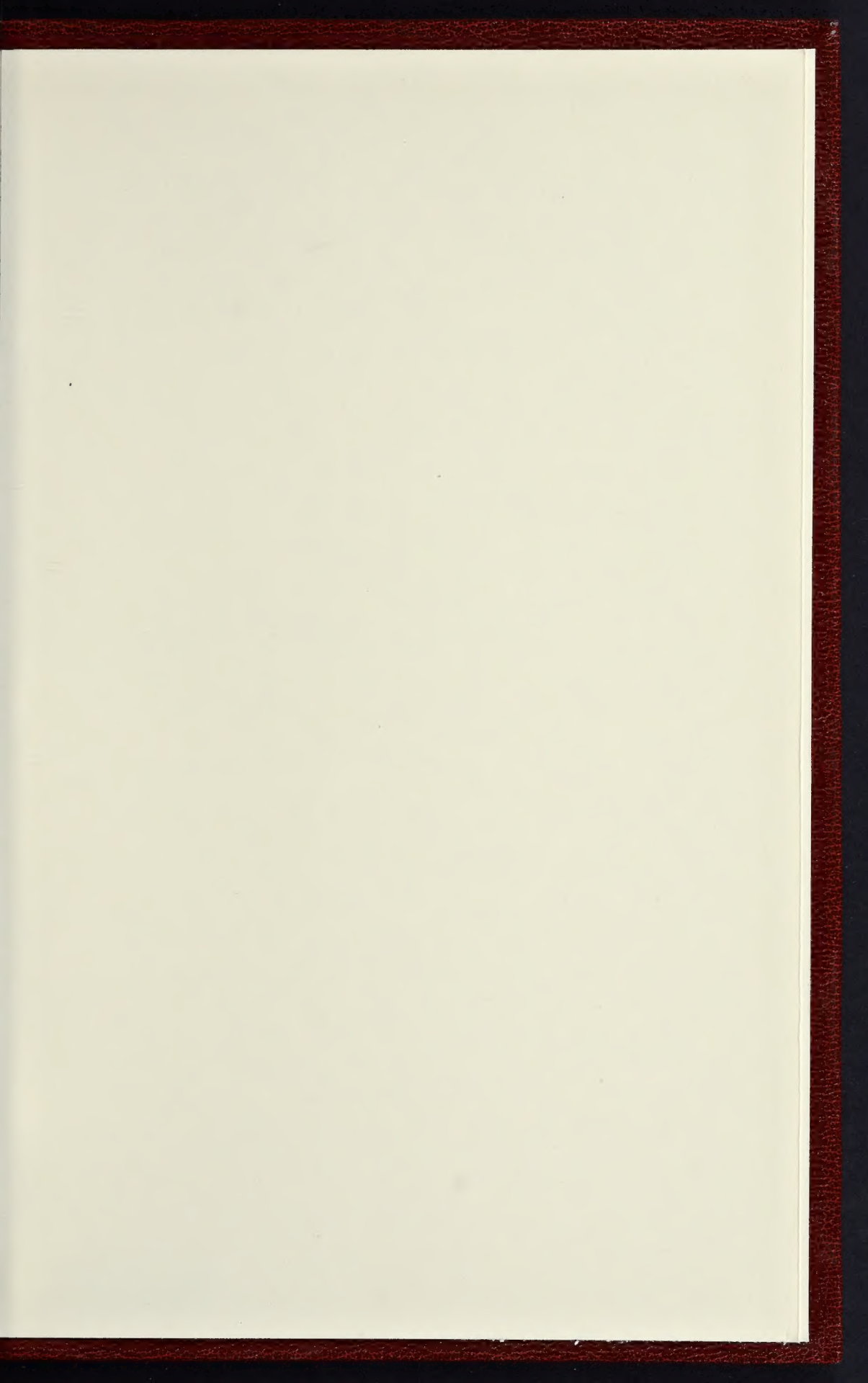
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